Value-added courses for imparting transferable and life skills

2020-21

Maharaja Ganga Singh University

A State University of Higher Education for Dignity and Self-Reliance
Approved by UGC under Section 12B of the UGC Act 1956

NH 15, Jaisalmer Road, Bikaner-334004 (Raj.) India
https://mgsubikaner.ac.in/

SCHEME OF EXAMINATION
AND
SYLLABUS

FACULTY OF COMPUTER

Masters in Computer Science (Semester System)
Choice Based Credit System

EXAMINATION 2021-22

Session 2020-21
Exam 2021 and 2022

@M.G.S. UNIVERSITY, BIKANER

SCHEME OF EXAMINATION

1. ELIGIBILITY FOR ADMISSION

Graduates possessing 50% marks in any faculty of any statutory university shall be eligible for admission to the M.Sc. Computer Science Course (Relaxation to SC/ST etc. as per Prevailing Rules)

2. PASS CRITERIA

For passing in the examination, a candidate is required to obtain at least 25% in each paper (Internal + External) and 36% marks in the total aggregate in theory and practical separately (in each semester examination).

3. CLASSIFICATION OF SUCCESSFUL CANDIDATE

Division	**Total Marks**
First Division	60% and above
Second Division	Above 48% and below 60%
Pass	Above 36% and below 48%
Fail	Below 36%

4. INSTRUCTIONS TO PAPER SETTER

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consists of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus).

The word limit of part A, B and C are 50, 200 and 500 respectively

5. INSTRUCTIONS FOT PRACTICAL EXAMINATION

Marks Distribution for Practical Exam -

1. Each practical exam is to be conducted by two examiners one External and one Internal. External examiner should be senior lecturer from jurisdiction of other universities. Marks distribution for external practical of 40 marks is as under
   a) Practical Examination exercise of 3 questions 30 marks
   b) Viva-Voce 5 marks
   c) Laboratory Exercise File 5 marks
2. Marks distribution for External Project report of 40 marks is as under
   a. External Evaluation-
      i. Research Project/ Case Study 25 marks
      ii. Presentation 10 marks
      iii. External Viva Voce 5 marks
   b. Internal Evaluation- Dissertation 10 Marks

6. INSTRUCTIONS FOR STUDENTS

- The student has to complete two months career oriented summer training from any firm/organization. If the student does not get chance to go for training, he/she can chose a research topic and can complete dissertation under the supervision of any of the faculty in his college.
- The student who has opt training, has to provide a signed certificate from the firm/ organization authority stating that the student has spent two months as a trainee in his organization/firm. The student who have opt dissertation, has to submit his/her dissertation report with a certificate from his supervisor.

- In both the cases student has to present his work in front of all the faculty members and fellow students at the starting of the next session.
- In terms of credits, every one hour session of L amounts to 1 credit per semester and a minimum of two hour session of T or P amounts to 1 credit per semester.

*** An Academic/ Industrial Tour shall be organized by the college/department in every session. A Tour Report shall be prepared and submitted by the students after a study tour to industries/academic institutions of repute.**

Masters in Computer Science (Semester System)
Choice Based Credit System
EXAMINATION 2020-21

Teaching and Examination scheme for
M.Sc. Computer Science (Semester System)
Examination 2021
Session 2020-21

Semester I									
Course Code	**Course Name**	**Exam Hours**	**Maximum Marks**		**Minimum Passing Marks**	**Credit**	**L**	**T**	**P**
			Internal Marks	**External Marks**					
Theory Papers									
MCS 101 (CC)	Mathematics for Computer Science	3	10	40	13 (25%)	5	4	1	0
MCS 102 (CC)	Internet Programming	3	10	40	13 (25%)	5	4	1	0
MCS 103 (CC)	Computer Organization	3	10	40	13 (25%)	5	4	1	0
MCS 104 (CC)	C++ Programming	3	10	40	13 (25%)	5	4	1	0
MCS 105 (CC)	Combined Practical	6	20	80	25 (25%)	5	0	0	5
			60	**240**		**25**			
Total of Theory (Internal 60 + External 240)				**300**	**108 (36% aggregate)**				

CC=Core Compulsory

Masters in Computer Science (Semester System)
Choice Based Credit System
EXAMINATION 2020-21

Teaching and Examination scheme for
M.Sc. Computer Science (Semester System)
Examination 2021
Session 2020-21

Semester II

Paper Code	Paper Name	Exam Hours	Maximum Marks		Minimum Passing Marks	Credits	L	T	P
			Internal Marks	External Marks					
Theory Papers									
MCS 201 (CC)	Database Management System	3	10	40	13 (25%)	5	4	1	0
MCS 202 (CC)	Data Communication and Networking	3	10	40	13 (25%)	5	4	1	0
MCS 203 (CC)	Operating System	3	10	40	13 (25%)	5	4	1	0
MCS 204 (CC)	PHP	3	10	40	13 (25%)	5	4	1	0
MCS 205 (CC)	Combined Practical	6	20	80	25 (25%)	5	0	0	5
			60	**240**		**25**			
Total of Theory (Internal 60 + External 240)				**300**	**108 (36% aggregate)**				

CC=Core Compulsory

Masters in Computer Science (Semester System)
Choice Based Credit System
EXAMINATION 2020-21

Teaching and Examination scheme for
M.Sc. Computer Science (Semester System)
Examination 2022
Session 2021-22

Semester III

Paper Code	Paper Name	Exam Hours	Maximum Marks		Minimum Passing Marks	Credits	L	T	P
			Internal Marks	External Marks					
Theory Papers									
MCS 301 (CC)	Data Structures	3	10	40	13 (25%)	5	4	1	0
MCS 302 (CE)	a) Java b) Python	3	10	40	13 (25%)	5	4	1	0
MCS 303 (CE)	a) Software Engineering & Research Methodology b) Artificial Intelligence	3	10	40	13 (25%)	5	4	1	0
MCS 304 (CC)	Combined Practical	6	20	80	25 (25%)	5	0	0	5
MCS 305 (EO)	a) Data Analysis Using R a) Introduction to LaTeX	3	10	40	13 (25%)	5	4	1	0
			60	**240**		**25**			
Grand Total (Internal 60 + External 240)				**300**	**108 (36% aggregate)**				

CC=Core Compulsory, CE= Core Elective, EO = Elective Open

Masters in Computer Science (Semester System)
Choice Based Credit System
EXAMINATION 2020-21

Teaching and Examination scheme for
M.Sc. Computer Science (Semester System)
Examination 2022
Session 2021-22

Semester IV

Paper Code	Paper Name	Exam Hours	Maximum Marks		Minimum Passing Marks	Credits	L	T	P
			Internal Marks	External Marks					
Theory Papers									
MCS 401 (CC)	a) Data Mining b) Computer Graphics & Multimedia	3	10	40	13 (25%)	5	4	1	0
MCS 402 (CE)	(a) Android Programming (b) Advanced Web Programming	3	10	40	13 (25%)	5	4	1	0
MCS 403 (CE)	a) Cloud Computing b) Internet of Things	3	10	40	13 (25%)	5	4	1	0
MCS 404 (CC)	Combined Practical	6	20	80	25 (25%)	5	0	0	5
MCS 405 (EO)	(a) Research Project (b) Case Study	3	10	40	13 (25%)	5	4	1	0
			60	**240**		**25**			
Grand Theory (Internal 60 + External 240)				**300**	**108 (36% aggregate)**				

CC=Core Compulsory, CE= Core Elective, EO = Elective Open

Masters in Computer Science (Semester System)
Choice Based Credit System
EXAMINATION 2021-22

Semester I

Paper Code:MCS-101
Paper Name: Mathematics for Computer Science

Objective – After successful completion of this course, the student will have the basic knowledge of Mathematics that is required for better understanding of other computer science courses.

Scheme of Examination

Maximum Marks: 50 Duration: 3 Hours
Minimum Passing Marks: 13
Credit: 5
The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consists of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus). The word limit of part A, B and C are 50, 200 and 500 respectively
Note: Non-Scientific Calculator may be allowed in end-semester examination.

Unit – I

Sets: different types of sets, set operations; Basic Counting Principles, Pigeonhole Principle, Binomial Coefficients, Binomial Theorem, Permutations, Combinations; Matrices: addition, multiplication; Vectors: Position vector, addition, subtraction and products of vectors.

Unit - II

Mathematical Induction; **Logic**: Propositions and logical operations, Conditional statements, Tautologies and Contradictions, Logical Equivalence, quantifiers.

Unit - III

Relations: Representation of Relations, Properties of relations, transitive closure; Ordered Sets: poset, Properties, Hasse Diagram, Extremal elements of posets ; **Functions**: Types of Functions, Asymptotic notations; Co-ordinate Systems: representation of points, straight lines, standard equation of circles.

Suggested Readings

1. Discrete Mathematics and its applications by K.H. Rosen, seventh edition
2.Discrete Mathematical Structures by Kolman, Busby and Ross, Sixth Edition, PHI.
3.Schaum'sOutline Of Theory and Problems of DiscreteMathematics, Third Edition. SEYMOUR LIPSCHUTZ
4. NCERT Mathematics textbook for class XI and XII
5. Elements of Discrete Mathematics, TMH, C L Liu
6.Foundation Mathematics for Computer Science: A Visual Approach,John Vince, Springer
7. Calculus and Analytic Geometry, George B. Thomas and Ross L. Finney, Addison Wesley

Masters in Computer Science (Semester System)
Choice Based Credit System
EXAMINATION 2021-22

Paper Code:MCS-102
Paper Name : Internet Programming

Objective - After successful completion of this course, the student will understand, analyze and apply the role languages like HTML, CSS, JavaScript and protocols in the workings of web and websites.

Scheme of Examination

Maximum Marks: 50 Duration: 3 Hours
Minimum Passing Marks: 13
Credit: 5

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consists of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus). The word limit of part A, B and C are 50, 200 and 500 respectively

Unit I

Internet Basics: Evolution of Internet, Basic internet terms and applications. ISP, Anatomy of an e-mail Message, basic of sending and receiving, E-mail Protocol; Mailing List-Subscribing, Unsubscribing. Introduction to World Wide Web and its work, Web Browsers, Search Engine, Downloading, Hyper Text Transfer Protocol (HTTP), URL, Web Servers, FTP, Web publishing- Domain Name Registration, Space on Host Server for Web Site,Maintain and Updating.

Unit - II

HTML: Elements of HTML & Syntax, Comments, Headings, Paragraph, Span, Pre Tags, Backgrounds, Formatting tags, Images, Hyperlinks, div tag, List Type and its Tags, Table Layout, div, frame, Use of Forms in Web Pages. CSS:Introduction to Cascading Style Sheets, Types of Style Sheets (Inline, Internal and External), using Id andClasses, CSS properties: Background Properties, Box Model Properties, Margin, Padding, List Properties, Border Properties, Positioning Properties,

Unit - III

Java Script: Introduction to Client Side Scripting, Introduction to Java Script, Comments, Variables in JS, Global Variables, Data types, Operators in JS, Conditions Statements (If, If Else, Switch), Java Script Loops (For Loop, While Loop, Do While Loop), JS Popup Boxes (Alert, Prompt, Confirm), JS Events, Onload, Onunload, Onsubmit, OnFocus, Onchange Event, Onblur Event, Onmouseover, Onclick, Ondbclick Events, JS Arrays, Working with Arrays, JS Objects, Window object, Document object, JS Functions, getElementById, innerHTML property, inner Text property, form validation, email validation.

Suggested Readings

1. Thomas A. Powell , “HTML: The Complete Reference”, Osborne/McGraw-Hill
2. Deitel, Deitel and Nieto : Internet & WWW. How to program, 2nd Edition, Pearson Education Asia.
3. E Stephen Mack, Janan Platt : HTML 4.0 , No Experience Required, 1998, BPB Publications.
4. "HTML Complete" by Sybex, BPB Publications, 2001.

5. Internet and Web Page Designing By V.K Jain (BPB)
6. Web Enabled Commercial Application Development Using HTML, DHTML , java script, Perl CGI By Ivan Bayross (BPB)

Masters in Computer Science (Semester System)
Choice Based Credit System
EXAMINATION 2021-22

Paper Code:MCS-103
Paper Name : Computer Organization

Objective - After successful completion of this course, the student will understand basic computer organization, design and micro-operations, understanding of CPU functioning and computer arithmetic, learning techniques of memory organization and 8085 Microprocessor.

Scheme of Examination

Maximum Marks: 50 Duration: 3 Hours
Minimum Passing Marks: 13
Credit: 5

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consists of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus). The word limit of part A, B and C are 50, 200 and 500 respectively

Note: Non-Scientific Calculator may be allowed in end-semester examination.

Unit I

Components of a Computer: Processor, Memory, Input-Output Unit, Difference between Organization and Architecture, Hardware Software Interaction. **Number System:** Concept of Bit and Byte, types and conversion. **Complements:** 1's complement, 2's complement. **Binary Arithmetic:** Addition, overflow, subtraction, multiplication (booth's algorithm) and division algorithm. **Logic gates:** Boolean Algebra, Map Simplification.

Unit II

Combinational circuits: Half Adder, Full Adder, Decoders, Multiplexers. **Sequential circuits:** Flip Flops- SR, JK, D, T Flip-Flop, Excitation Tables, State Diagram, State Table,, Registers, Counters.

Input Output Organization: Peripheral devices, I/O Interface, Asynchronous Data Transfer, Modes of Data Transfer, Priority Interrupt, Direct Memory Access, I/O Processor.

Memory Organization: Types and capacity of Memory, Memory Hierarchy, Associative Memory, Buffer, Cache Memory, Virtual Memory.

Unit III

Intel 8085 Microprocessor: Introduction, ALU, Timing and Control Unit, Register Set, Data and Address Bus, Addressing modes, Complete Intel 8085 Instruction set, Instruction format, Opcode and Operand, Word Size, Instruction Cycle, Pin Configuration, Intel 8085 programs.

Suggested Readings

1. Computer System Architecture, By M. Morris Mano (Pearson, Prentice Hall)
2. J.P. Hayes, "Computer Architecture & Organization", Tata McGraw Hill
3. Digital Computer Electronics By Malvino Leach, Jerald A. Brown(McGraw Hill)

4. Microprocessor Architecture, Programming, and Application With the 8085 By Ramesh Gaonkar (PENRAM)
5. Fundamentals of Microprocessor and Microcomputes By B.Ram (Danpat Rai Publications)

Masters in Computer Science (Semester System)
Choice Based Credit System
EXAMINATION 2021-22

Paper Code:MCS-104
Paper Name : C++ Programming

Objective – After successful completion of this course student will have an understanding for the concepts of object oriented programming and a practical hand to solve the various problems using C++ programming language in a professional way.

Scheme of Examination

Maximum Marks: 50 Duration: 3 Hours
Minimum Passing Marks: 13
Credit: 5

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consists of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus). The word limit of part A, B and C are 50, 200 and 500 respectively

Unit I

Object Oriented System Object Oriented Paradigm: need, characteristics, applications. Basics of C++, branching, looping and jump statements. **Functions** : need, types, passing arguments by value and reference, recursive function, pointers and functions. **Arrays**: need, types, array and function, array and pointers.

Unit II

Class: Basics, static data members, Inline Function, Constructors and Destructors: need, types, usage, **Inheritance** - need, usage, types, compile time and run time polymorphism, overloading and overriding, virtual function, friend function, abstract class. **Operator overloading**: need, rules, through member function and through friend function.

Unit III

String handling, String class, Templates,Additional Features for C++ 11, C++14 and C++17 Searching and Sorting: **Searching**: Linear Search, Binary Search. **Sorting:** Insertion Sort, Selection Sort, Quick Sort, Bubble Sort, Heap Sort, Shell Sort, Merge sort, Radix Sort, Counting Sort, Bucket Sort.

Suggested Readings

1. Object Oriented Programming With C++ By E. Balagurusamy (Tata Mcgraw Hill)
2. C++ The Complete Reference By Herbert Sehildt (Tata Mcgraw Hill)
3. Object Oriented Programming With C++ By Schaum Series (Tata Mcgraw Hill)
4. C++11 for Programmers (Deitel Developer) by Paul J. Deitel (Author), Harvey M. Deitel, Prentice Hall; 2nd edition
5. Professional C++ by Marc Gregoire, Nicholas A. Solter and Scott J.Kleper (Goodreads Publications)
6. A Tour of C++ by Bjarne Stroustrup, 2018
7. C++17 in Detail by Bartłomiej Filipek

8.

Paper Code:MCS-201

Paper Name : Database Management System

Objective – The aim of this course is to furnish students with the knowledge about back end of software systems. After completing this course, the students will be well versed with the required theoretical and practical aspects of designing, creating and using a database.

Scheme of Examination

Maximum Marks: 50 Duration: 3 Hours
Minimum Passing Marks: 13
Credit: 5

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consists of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus). The word limit of part A, B and C are 50, 200 and 500 respectively

Unit I

Introduction: Charecteristics of database approach, Advantages, Database system architecture, Overview of different types of Data Models and data independence, Schemas and instances, Databse languges and interfaces; **E-R Model** : Entities, Attributes,keys, Relationships, Roles, Dependencies, E-R Diagram; Normalization: Definition, Functional dependencies and inference rules, 1NF, 2NF, 3NF and BCNF.

Unit II

Introduction to Relational model, Constraints: Domain, Key, Entity integrity, Referential integrity; Keys: Primary, Super, Candidate, Foreign; **Relational algebra**: select, project, union, intersection, minus, cross product, different types of join , division operations; aggregate functions and grouping**; SQL**: Data Types, statements: select, insert, update,delete, create, alter, drop; views, SQL algebraic operations, nested queries; Stored procedures: Advantages, Variables, creating and calling procedures, if and case statements, loops, Cursors, Functions, Triggers.

Unit III

Transactions processing: Definition , desirable properties of transactions, serial and non-serial schedules ,concept of serialazability , conflict-serializable schedules; **Concurrency Control:** Two-phase locking techniques, dealing with Deadlock and starvation, deadlock prevention protocols, basic timestamp ordering algorithm; Overview of database recovery techniques; concept of data warehousing.

Suggested Readings

1. Fundamentals of Database Systems,Ramez A. Elmasri, Shamkant Navathe,5th Ed(Pearson)
2. Database System Concepts By Korth, Silberschatz, Sudarshan (Mcgraw Hill)
3. An Introduction to Database Systems By Bipin C. Desai (Galgotia Publication.)
4. SQL, PL/SQL Programming By Ivan Bayross (BPB)
5. Commercial Application Development Using Oracle Developer 2000 By Ivan Bayross (BPB)

Web Resources

1. http://www.mysqltutorial.org/mysql-stored-procedure-tutorial.aspx

Masters in Computer Science (Semester System)
Choice Based Credit System
EXAMINATION 2021-22

Paper Code:MCS-202
Paper Name : Data Communication and Networking

Objective – After successful completion of this course student will have an understanding of network, concepts transmission media and realize and compare different LAN topologies, implement and compare the performance of different Layer protocols and cyber security.

Scheme of Examination

Maximum Marks: 50 Duration: 3 Hours
Minimum Passing Marks: 13
Credit: 5

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consists of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus). The word limit of part A, B and C are 50, 200 and 500 respectively

Unit - I

Data Communication and Networking: Overview, Network Types, LAN Technologies, Topologies, Models- OSI Model, TCP/IP Stack, Security

Physical Layer: Introduction, Impairments, Performance, Digital Transmission, modes, digital to digital, analog to digital, Analog Transmission, digital to analog, analog to analog, Transmission media, Wireless Transmission, Multiplexing, FDM, TDM, CDM, WDM, **Switching techniques:** Circuit Switching, Packet switching, Datagram, Virtual circuit and Permanent Virtual Circuit, Connectionless and connection oriented communication, Message switching,

Unit - II

Data Link Layer: Introduction, Error detection and Correction, Data Link Control: Line Discipline- Enq/Ack, Poll/Select, **Flow Control** : Stop And Wait, Sliding Window, **Error Control :** ARQ, Stop and Wait ARQ, Sliding Window ARQ.

Network Layer: Introduction, Network Addressing, Routing, Internetworking, Tunneling, Packet Fragmentation, Network Layer Protocols, ARP, ICMP, IPv4, IPv6

Transport Layer: Introduction, Function, End to end communication, Transmission Control Protocol, User Datagram Protocol

Application Layer: Introduction, Client-Server Model, Application Protocols, Network Services

Unit - III

Cyber Security: definition, cybercrime and information security, cybercriminals, classification of cybercrime. Cyber offences: categories of cybercrime.

Tools and methods used in cybercrime: phishing, types of phishing, types and techniques of ID theft, password cracking, keyloggers and spywares, backdoors, steganography, DoS, SQL Injection.

Cybercrime on mobile and wireless devices: attacks on wireless networks, Authentication security service, attacks on mobile phones. Cyber Law, The Indian IT Act, Digital Signatures, Anti- Cybercrime Strategies, Cyberterrorism, Indian ITA 2000.

Suggested Readings

1. Cyber Security by Nina Godbole & sunit Belapure
2. Data Communication and Networking By Forozan (Tata McGraw Hill)
3. Data Communication And Computer Networks By Dr. Madhulika Jain, Satish Jain (BPB)
4. William Stallings, “Data and Computer Communications”, Pearson Education, 2008.
5. A. S. Tanenbaum, “Computer Networks”, Fourth Edition, Pearson Education.

Masters in Computer Science (Semester System)
Choice Based Credit System
EXAMINATION 2021-22

Paper Code:MCS-203
Paper Name : Operating System

Objective – After successful completion of this course, the student will have fundamental knowledge of internal working of operating system and basic working knowledge of Linux.

Scheme of Examination

Maximum Marks: 50 Duration: 3 Hours
Minimum Passing Marks: 13
Credits: 5
The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consists of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus). The word limit of part A, B and C are 50, 200 and 500 respectively

Unit I

Introduction to Operating System, layered Structure, Functions, Types; Process: Concept, Process States, PCB; Threads, System calls; Process Scheduling: types of schedulers, context switch, CPU Scheduling, Pre-Emptive Scheduling, Scheduling Criteria- CPU Utilization, Throughput, Turnaround Time, Waiting Time, Response Time; Scheduling Algorithms- FCFS, SJF, Priority Scheduling, Round Robin Scheduling, MLQ Scheduling, MLQ With Feedback.

Unit II

Synchronization: Critical Section Problem, Requirements for a solution to the critical section problem; Semaphores,simple solution to Readers-Writers Problem. Deadlock: Characterization, Prevention, Avoidance, Banker's Algorithm, Recovery from Deadlock. Memory Management: Physical and virtual address space, Paging, Overview of Segmentation;Virtual Memory Management: Concept,Page Replacement techniques- FIFO, LRU, Optimal

Unit III

Linux:features of Linux, steps of Installation, Shell and kernel, Directory structure, Users and groups,file permissions, commands- ls, cat, cd, pwd, chmod, mkdir, rm, rmdir, mv, cp, man, apt, cal, uname, history etc. ; Installing packages; Shell scripts: writing and executing a shell script,shell variables, read and expr, decision making (if else,case), for and while loops.

Suggested Readings

1. Operating System Principals By Abraham Silberschatz, Peter Baer Galvin (John Wiley And Sons Inc.)
2. Operating System Concepts And Design By Milan Milen Kovic (Tata Mcgraw Hill)
3. Modern Operating System Andrew S. Tanenbaum, Herbert Bos
4. Linux in easy steps, Mike McGrath, in easy steps limited
5. Unix concepts and apllications , TMH, Sumitabha Das

Masters in Computer Science (Semester System)
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EXAMINATION 2021-22

Paper Code:MCS-204
Paper Name : PHP

Objective – After successful completion of this course, the student will have Learn the basic concepts & techniques of php, generate an application based upon the concepts of php and will learn how to connect a php application with database.

Scheme of Examination

Maximum Marks: 50 Duration: 3 Hours
Minimum Passing Marks: 13
Credit: 5

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consists of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus). The word limit of part A, B and C are 50, 200 and 500 respectively

Unit – I

PHP: Installation of PHP. **Building Blocks of PHP:** Variables, data types, Operators & Expressions, Constants, Switching, Flow, Loops. **Functions:** Meaning, Calling, Defining a function. Return value from user defined function. **Arrays:** Creating arrays, Array related functions.**Working with String, Date & Time:** Formatting String with PHP, Using Date and time Functions with PHP. Working with file and Directories.

Unit – II

Forms: Creating simple input Form. Accessing Form input with user defined arrays, HTML and PHP Code on a single page. Redirecting User. Working with File Upload. Uploading & Downloading.**State management:** Using query string(URL rewriting), Using Hidden field, Using cookies, Using session. **Email**: Sending Email, Headers. **Exception Handling:** Understanding Exception and error, Try, catch, throw

Unit – III

Connecting to the MYSQL: Selecting a database, Adding data to a table, Displaying returned data on Web pages, Inserting data, Deleting data, Entering and updating data, Executing multiple queries, executing stored procedures.

Suggested Readings

1. Teach Yourself PHP, MYSQL &Apache ByMeloni, Pearson Education.
2. Open Source Development with LAMP: Using Linux, Apache, MySQL, Perl & PHP By James Lee, Pearson Education.
3. PHP: A Beginner's Guide ByVaswani, Vikram Tata Mc-Graw Hill.

Masters in Computer Science (Semester System)
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EXAMINATION 2021-22

Paper Code:MCS-301
Paper Name : Data Structures

Objective – This offered course give student an insights into programming structures where data can be hold by a program during the runtime. After successful of this course, the student will be able to effectively create and use data structures in the program.

Scheme of Examination

Maximum Marks: 50 Duration: 3 Hours
Minimum Passing Marks: 13
Credit: 5

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consist of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus). The word limit of part A, B and C are 50, 200 and 500 respectively

Unit I

Algorithm: Efficiency & Analysis Algorithm: Time and Space complexity of Algorithm. **Abstract Data Type: Linked List-** Linear, Circular, Two Way List, Basic Operation on Linked Lists, Application of Linked List.

Unit II

Stack : primitive operations, stack Application- Infix, postfix, prefix and Recursion Array and Linked Representation of Stack. **Queue:** Primitive operation, Circular Queue, Priority Queue, D-queue, Array and Linked Representation of Queue.

Unit III

Trees : Basic terminology, **Binary Tree** : Representation as Array and link List, Basic operation, **Tree Traversal** : Inorder, Preorder, Postorder, Application of Binary Tree. B-tree, Height Balance Tree (AVL Tree) **Graph :** Basic Terminology, Directed, Undirected, Weighted, Representation of Graphs, **Graph Traversal** : Depth First Traversal, Breadth First Search.

Suggested Readings

1. Expert Data Strutcture with 'C' By R.B Patel (Khana Book Publishing Co.(P))
2. Data structure By Lipschutz (Tata McGraw Hill)
3. Data Structure By Yashvant Kanitkar (BPB)
4. An Introduction to Data Structures with Applications By Jean-Paul Tremblay, Paul G.Sarerson (Tata McGraw Hill)
5. Data Structure Using C and C++ By Yedidyah Langsam, Moshe J.Augenstein, Arora M. Tenenbaum (Prentice- Hall India)

Masters in Computer Science (Semester System)
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EXAMINATION 2021-22

Paper Code:MCS-302(a)
Paper Name : Java

Objective – This course is offering the basic concepts & techniques of OOPs with java, multithreading, exceptions, applets and students will able to generate an application based upon the concepts of java.

Scheme of Examination

Maximum Marks: 50 Duration: 3 Hours
Minimum Passing Marks: 13
Credit: 5

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consists of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus). The word limit of part A, B and C are 50, 200 and 500 respectively

Unit I

Introduction to java: evolution, features, comparison with C and C++; Java program structure; tokens, keywords, constants, variables, data types, type casting, statements, Operators and Expression; Conditional Statements and Loop Statements. **Class:** syntax, instance variable, class variables, methods, constructors, overloading.

Unit II

Inheritance: types of inheritance, use of super, method overriding, final class, abstract class, wrapper classes.

Arrays, Strings and Vectors, Packages and Interfaces, visibility controls

Unit III

Errors and Exceptions: Types of errors, Exception classes, Exception handling in java, use of try, catch, finally, throw and throws. Taking user input, Command line arguments.

Multithreaded Programming: Creating Threads, Life cycle of thread, Thread priority, Thread synchronization, Inter-thread communication, Implementing the Runable Interface.

Suggested Readings

1. The Complete reference Java Ninth Edition By Herbert Schildt (Tata McGraw Hill)
2. Beginning Programming with Java For Dummies by Burd, For Dummies; 3 edition
3. Java: A Beginner's Guide, Sixth Edition: A Beginner's Guide by Herbert Schildt, McGraw-Hill Osborne MediaProgramming in JAVA By E. Balagurusamy (TMH)
4. JAVA 2 programming Black Book By Steven Holzner et al. (Dreamtech Press)
5. Programming in JAVA By E. Balagurusamy (TMH)

Paper Code:MCS-302(b)
Paper Name : Python

Masters in Computer Science (Semester System)
Choice Based Credit System
EXAMINATION 2021-22

Objective – After successful completion of this course, the student will have the fundamental knowledge of programming in Python and various constructs.

Scheme of Examination

Maximum Marks: 50 Duration: 3 Hours
Minimum Passing Marks: 13
Credit: 5

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consist of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus). The word limit of part A, B and C are 50, 200 and 500 respectively

Unit I

Basics: Python Interpreter, writing code in Jupyter Notebook, Indentation, comments, importing a module, binary operators, standard scalar data types, type casting, if-else statements, loops(while, for), pass, range, ternary expressions. Data Structures and Sequences: Tuples, Lists and slicing, Built-in Sequence functions, Dictionary, Sets; List, Set, and Dict Comprehensions.

Unit II

Functions: Namespaces, Scope, and Local Functions; Returning Multiple Values, Anonymous (Lambda) Functions, Partial Argument Application, Generators, Errors and Exception handling. Basic File Handling. Objects and Methods in Python. NumPy: creating N-dimensional arrays, arithmetic with NumPy arrays, basic indexing and slicing, Psuedorandom number generation.

Unit III

Pandas: Overview of Series and DataFrames, reading data from csv file, DataFrame operations- working with data using functions like head, tail , info, shape, reshape, columns, isnull, dropna, mean, sum, describe, value_counts, corr, loc, iloc, apply. Matplotlib- plotting basic figures, subplots, line plots, bar plots, histograms, scatter plots. Overview of Scikit-learn, SciPy, networkx. Applications of python.

Suggested Readings

1. Python for Data Analysis: Data Wrangling with Pandas, NumPy, and Ipython, by Wes McKinney, O'Reilly Media, 2017
2. Python All-in-One for Dummies, by John Shovic and Alan Simpson, John Wiley & Sons, Inc., 2019
3. Programming in Python 3: A Complete Introduction to the Python Language, Mark Summerfield, Pearson.

4. Swaroop, C. H. (2003). A Byte of Python. Python Tutorial.
5. Introduction to Computation and Programming Using Python. By John V. Guttag, MIT Press.
6. Learning Python , Mark Lutz, David Ascher, O'Reilly
7. T. Budd, Exploring Python, TMH, 1st Ed, 2011

Web Resources

1. https://www.learnpython.org/
2. https://nptel.ac.in/courses/106/106/106106212/
3. http://greenteapress.com/thinkpython/thinkpython.pdf
4. Python tutorial: https://docs.python.org/3/tutorial/index.html

Masters in Computer Science (Semester System)
Choice Based Credit System
EXAMINATION 2021-22

Paper Code:MCS-303(a)
Paper Name : Software Engineering & Research Methodology

Objective – After completing this course the student will have an understanding of concepts of software engineering and Research Methodology

Scheme of Examination

Maximum Marks: 50 Duration: 3 Hours
Minimum Passing Marks: 13
Credit: 5

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consists of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus). The word limit of part A, B and C are 50, 200 and 500 respectively

Note: Scientific Calculator may be allowed in end-semester examination.

Unit I

Software : Software Characteristics, Software Process, Process Characteristics, **Software Process Model :** Linear Sequential Model, Prototyping Model, Spiral Model, Software Quality, McCall's Quality Factors, **Software Requirement Analysis and Specification (SRS) :** Need Characteristics and Components.

Unit II

Planning a Software Project: COCOMO Model, Project Monitoring Plan and Risk Management. **Design Principle :** Abstraction, Modularity, Cohesion and Coupling, **Software Management** : Size Oriented Matrices, Function Oriented Matrices. **Testing :** Testing Fundamental, Functional Testing (Black Box), Structural Testing (White Box), Alpha And Beta Testing, **Testing Process :** Comparison of Different Testing, Level of Testing.

Unit III

Research Methodology: Meaning of Reaserch, Objective of Research, Types of Research, Research Approaches, Significance of research, Research Methods versus Methodology, Research Process,Criteria of Good Research, , What is Research Problem, Selecting the problem, Necessity of defining the problem, Technique involved in defining a problem.

Suggested Readings

1. Software Engineering: A Practitioner's Approach By Roger S. Pressman, McGraw Hill.
2. Software Engineering: A Precise Approach by Pankaj Jalote, Wiley Precise textbook Series
3. Research Methodology Methods and Techniques by C. R. Kothari, New Age International Publisher

Masters in Computer Science (Semester System)
Choice Based Credit System
EXAMINATION 2021-22

Paper Code:MCS-303(b)
Paper Name : Artificial Intelligence

Objective – The proposed course offer students the idea various aspects and applications of artificial intelligence.

Scheme of Examination

Maximum Marks: 50 Duration: 3 Hours
Minimum Passing Marks: 13
Credit: 5

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consists of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus). The word limit of part A, B and C are 50, 200 and 500 respectively

Unit I

Definition, History, Agents and environment, Defining the problem as a state and space search, What is Intelligence? Types of Intelligence, Difference between Human and Machine Intelligence, The Structure of Intelligent Agents. Solving problems by searching: Uninformed search strategies- Brute-Force, Breadth-First, Uniform-cost search Depth-First, Depth-limited search,depth-first search, Bidirectional search.Informed (heuristic) search strategies- Greedy best-first search, A*, AO* Memory-bounded heuristic search.

Unit II

Heuristic functions, local search algorithms- Hill-climbing search, Simulated annealing, Local beam search. Knowledge Based System: Knowledge, Procedure V/S Declarative Knowledge, Knowledge Representation: Using Procedural and Predicate Logic, Inference in First order logic: Unification and Lifting, Forward Chaining, Backward Chaining, Resolution. Rule based System, Frames, Frames, Scripts, and Semantic Nets.

Unit III

Probabilistic Reasoning, Probability and Byes Theorem, represent knowledge in uncertain domain, Certainty factors, Baysian Networks, Dempster–Shafer theory, introduction to Fuzzy logic. Learning: types of learning, decision trees. **Expert System: types, architecture. Introduction to A**rtificial Neural Networks, Reinforcement learning, Natural Language Processing, Pattern Recognition and Perception.

Suggested Readings

1. Artificial Intelligence By Rich And Knight (Tata McGraw Hill)
2. Introduction to Artificial Intelligence and Expert Systems By Patterson (Prentice-Hall India)
3. Artificial Intelligence A Modern Approach by Russell and Norvig, Prentice Hall

Masters in Computer Science (Semester System)
Choice Based Credit System
EXAMINATION 2021-22

Paper Code:MCS-305(a)
Paper Name : Data Analysis Using R

Objective - After successful completion of this course, the student will have working knowledge of R and he/she will be able to do elementary data analysis using R.

Scheme of Examination

Maximum Marks: 50 Duration: 3 Hours
Minimum Passing Marks: 13
Credit: 5

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consists of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus). The word limit of part A, B and C are 50, 200 and 500 respectively

Unit I

Foundations for data analysis-matrices, notion of probability, concept of random variables and various distributions, mean, variance, covariance, normal distributions, overview of sampling , hypothesis testing, confidence interval, concept of optimization.

Unit II

installation of R, data editing, use of R as a calculator; functions and assignments. matrix operations, logical operators, Conditional executions and loops, data management with sequences, repeats, sorting and ordering, lists, vector indexing, factors; display and formatting of strings.

Unit III

Working with data frames, Importing data files; Graphics and plots; basic statistical functions for central tendency, variation, boxplots, skewness and kurtosis, correlations; overview of using R functions for a simple hypothesis testing, Applications of R .

Suggested Readings:

1. Hands–On Programming with R, Garrett Grolemund , O′Reilly Publishers.
2. R for Beginner - https://cran.r-project.org/doc/contrib/Paradis-rdebuts_en.pdf
3. A Learning Guide to R - https://www.westernsydney.edu.au/__data/assets/pdf_file/0011/830909/Rnotes_20180905_web.pdf
4. Applied Statistics and Probability For Engineers – by Douglas Montgomery, John Wiley & Sons Inc.
5. Research Methodology : Methods And Techniques, C.R. Kothari , New Age International Publishers.
6. Design and Analysis of Experiments (Wiley India) , Montgomary, Douglas C.

Masters in Computer Science (Semester System)
Choice Based Credit System
EXAMINATION 2021-22

Paper Code:MCS-305(b)
Paper Name : LaTeX: a document preparation system

Objective - After successful completion of this course, the student will be able to create a polished document with high typographical quality for research papers/articles.

Scheme of Examination

Maximum Marks: 50 Duration: 3 Hours
Minimum Passing Marks: 13
Credit: 5

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consists of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus). The word limit of part A, B and C are 50, 200 and 500 respectively

Unit I

Installation of the software LaTeX, Structure of LaTeX documents; Special Characters, Producing equations, Matrices, Tables, itemised lists, hypertext links ;Page Layout –Title, Abstract , Chapters, Sections, References.

Unit II

Including graphics, images, floating bodies; Producing basic mathematical graphics like line segments, arrows, circles, ovals, Generating index and bibliography, creating PDF file.

Unit III

Adding a new command; generating spaces ,colored text ; Writing a sample resume, question paper , article/ research paper; Creating presentation using beamer.

Suggested Readings:

1. LaTeX: A Document Preparation System, By Leslie Lamport, Addison- Wesley.
2. LaTeX Beginner's Guide , by Stefan Kottwitz , Packt Publishing Limited
3. Tobias Oetiker, Hubert Partl, Irene Hyna and Elisabeth Schegle: The Not So Short Introduction to LaTeX 2e, https://tobi.oetiker.ch/lshort/lshort-a5book.pdf, 2014.

Masters in Computer Science (Semester System)
Choice Based Credit System
EXAMINATION 2021-22

Paper Code:MCS-401(a)
Paper Name : Data Mining

Objective – After successful completion of this course, the student will have the basic knowledge of concepts including classification, association and clustering.

Scheme of Examination

Maximum Marks: 50 Duration: 3 Hours
Minimum Passing Marks: 13
Credit: 5

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consists of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus). The word limit of part A, B and C are 50, 200 and 500 respectively

Note: Scientific Calculator may be allowed in end-semester examination.

Unit I

Data mining Introduction: Definition, Data mining tasks, Data mining as a step of Knowledge discovery process, Applications of Data mining; Data objects and types of attributes, Recalling mean, median ,mode and weighted arithmetic mean, Data quality , overview of data preprocessing.

Unit II

Classification analysis- definition, Overview of various classification techniques; Decision tree induction- working, examples ,specifying attribute test conditions , Measures of node impurity, measures for selecting best split; Evaluating the performance of a classifier- Holdout method, Random subsampling , cross-validation, Bootstrap.

Unit III

Association analysis: support, confidence, association rules, Frequent Item sets; Frequent itemset generation - Apriori principle , Apriori algorithm and examples, FP growth algorithm and examples; Closed and maximal frequent itemsets. Cluster analysis: Definition , overview of basic clustering methods, Density based methods-DBSCAN.

Suggested Readings

1. Data Mining: Concepts and Techniques, 3rd edition, Jiawei Han and Micheline Kamber
2. Introduction to Data Mining, Pang-Ning Tan, Michael Steinbach, Vipin Kumar, Pearson Education.
3. Data Mining: A Tutorial Based Primer, Richard Roiger, Michael Geatz, Pearson Education 2003.
4. Introduction to Data Mining with Case Studies, G.K. Gupta, PHI 2006
5. Insight into Data mining: Theory and Practice, Soman K. P., DiwakarShyam, Ajay V., PHI 2006
6. Data Mining:: Practical Machine Learning Tools and Techniques (Morgan Kaufmann Series in Data Management Systems) by Witten, Frank, Hall

Masters in Computer Science (Semester System)
Choice Based Credit System
EXAMINATION 2021-22

Paper Code:MCS-401(b)
Paper Name : Computer Graphics & Multimedia

Objective – After successful completion of this course, the student will have the fundamental knowledge of computer graphics , multimedia and working knowledge of Blender tool.

Scheme of Examination

Maximum Marks: 50 Duration: 3 Hours
Minimum Passing Marks: 13
Credit: 5

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consists of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus). The word limit of part A, B and C are 50, 200 and 500 respectively

Note: Non-Scientific Calculator may be allowed in end-semester examination.

Unit I

Basic elements of Computer Graphics, Graphics display devices, Applications of Computer Graphics, Raster and random scan; Color Models :RGB, CMY, HSV; Graphics Standard : openGL; Scan Conversion: DDA line algorithm, Mid-point circle Algorithm. 2D Transformation: Translation, Rotation, Scaling, Homogenous Co-ordinates and Matrix Representation of 2D Transformation, Composite Transformation.

Unit II

3D Graphics: Matrix Representation of 3D transformations, Translation, Rotation, Scaling, Composite Transformation. Overview of concepts:Clipping, orthographic and parallel projection, hidden surface removal, lighting , transparency, modelling and texturing, rendering ; Animations : Principles of animations ,keyframing,concept of 2D and 3D animation .

Unit III

Blender: GUI Interface, Selecting,rotating and Translating Objects, Using Snap to move objects precisely, Creating mesh primitives and extrusions, Subdividing meshes, Creating a simple creature, Joining mesh objects and stitching vertices , Organizing a scene with layers, groups, and hierarchies, Assigning glossy and reflective materials to objects, Creating bump maps, Creating sky and ambient light, Understanding ambient occlusion, Adding motion blur and depth of field, Editing animation in the Graph Editor, Building and animating a simple character.

Suggested Readings

1. Computer Graphics (Principles and Practice) by Foley, van Dam, Feiner and Hughes, Addisen Wesley (Indian Edition)
2. Computer Graphics by D Hearn and P M Baker, Printice Hall of India (Indian Edition).
3. Mathematical Elements for Computer Graphics by D F Roger.
4. Introduction to Computer Graphics By Krihsnamurthy N (Tata McGraw Hill
5. Theory and Problems of Computer Graphics (Schaum's Outline) By Zhigang X. and Plastock Ra. (Tata McGraw Hill)

Web Resources

1. https://www.cs.duke.edu/brd/Teaching/Previous/Animation/animation.html
2. http://zikky.lecturer.pens.ac.id/Produksi 3D untuk Designer/Beginning Blender-book.pdf
3. http://www.blenderhd.com/wp-content/uploads/2015/08/BeginnersGuideToBlender.pdf
4. https://people.sc.fsu.edu/~gerlebacher/gd/blender/blender/blender_noob_to_pro.pdf

5. http://download.blender.org/documentation/pdf/John M Blain - An Introduction To Blender 3D - A Book For Beginners (2011).pdf
6.http://www.cdschools.org/cms/lib04/PA09000075/Centricity/Domain/81/BlenderBasics_4thEdition2011.pdf
7. https://docs.blender.org/manual/en/dev/index.html

Masters in Computer Science (Semester System)
Choice Based Credit System
EXAMINATION 2021-22

Paper Code:MCS-402(a)
Paper Name : Android Programming

Objective – This offered course give students the basic concepts & techniques of Android Programming with java and they will able to generate a mobile app based upon the concepts of android.

Scheme of Examination

Maximum Marks: 50 Duration: 3 Hours
Minimum Passing Marks: 13
Credit: 5

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consists of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus). The word limit of part A, B and C are 50, 200 and 500 respectively

Unit -I

Introduction: What is Android?, Android Architecture, Setting Android Environment, Android SDK Manager & required Packages, Using Android Studio, Android Virtual Device(AVD), Creating First Android Application, Package Structure, Introduction to Gradle, Running the Application, Views, Layouts and more.

Unit – II

Introduction to Views: TextView, EditText View, RadioButton and CheckBox View, Button View, ImageView and ImageButton View, Toast, Notifications.

Introduction to Layouts/ViewGroups: Linear Layout, Relative Layout, Tabular Layout, Hierarchical Layout Arrangements, Adapter and Adapter View, Using ListView and GridView, SQLite Database.

Unit – III

Spinner in Android, Working with Spinners, Margin and Padding, Working with EditText and TextView, RadioGroup, RadioButton and CheckBox, AutoCompleteTextView in Android, Android Core and Projects.

Location Based Services: Sending Email, Sending SMS, Phone Calls

Activity in Android, Intents in Android, Introduction to Fragments, Working with Fragments

Suggested Readings

1. Android Programming for Beginners by John Horton Publisher: Packt Publishing
2. Learn Java for Android Development (2nd edition) by Jeff Friesen Publisher: Apress
3. Android application development for java programmers. By James C. Sheusi. Publisher: Cengage Learning, 2013.
4. Beginning Android Programming with Android Studio, Fourth Edition by Jerome F. DiMarzio Publisher: John Wiley & Sons
5. Android Programming: The Big Nerd Ranch Guide by Kristin Marsicano , Chris Stewart , Bill Phillips Publisher: Big Nerd Ranch Guides

Masters in Computer Science (Semester System)
Choice Based Credit System
EXAMINATION 2021-22

Paper Code:MCS-402(b)
Paper Name : Advanced Web Programming

Objective – This offered course give students the basic concepts & techniques of OOPs with C# and make the able to generate a web application based upon the concepts of ASP.NET with C# and database connectivity.

Scheme of Examination

Maximum Marks: 50 Duration: 3 Hours
Minimum Passing Marks: 13
Credit: 5

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consists of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus). The word limit of part A, B and C are 50, 200 and 500 respectively

Unit -I

Basic of the .NET framework: .NET Architecture, managed code, assemblies, clr, execution of assemblies code, il, jit, net framework class library, common type system, common language specification**.** Overview C#, similarities and differences from JAVA, Structure of C# program. Language features- Type system, boxing and Unboxing, flow controls, Classes, Properties, Indexers, Constructors, Inheritance, Interfaces, Delegates.

Unit -II

Understanding ASP.NET Controls: Web forms, Buttons, Text Box, Labels, Checkbox, Radio Buttons, List Box etc. Running a web Application, creating a multiform web project, Form Validation Controls- Required Field, Compare, Range. Calendar Control, Ad Rotator Control, State Management-View State, Session State, Application State.

Unit -III

Architecture Of ADO.NET, Connected and Disconnected Database, Create Connection Using ADO.NET Object Model, Connection Class, Command Class, DataReader Class, Data adapter Class, Dataset Class. Display Data on Bound Controls and Gridview. Database Accessing on Web Applications: Insert records in database, delete and update records from database, Display a particular record and all records on web form.

Suggested Readings

1. ASP.NET 2.0 Black Book By RudrakshBatra, CharulShukla (Dream Tech Press)
2. ASP. NET Bible By MridulaParihar and et al. (Hungry Minds, New York)
3. Andrew Troelsen – "C# and the .Net Platform" – Apress – 2001.(Unit I and II)
4. Alex Homer et. al. – "Professional ASP .NET 1.1" – Wiley-dreamtech India Pvt. Ltd. – 2004.
5. ASP.NET Developer's Guide By G Buezek (TMH)
6. .NET Framework Essentials 3rd Edition (O'Reilly)

Masters in Computer Science (Semester System)
Choice Based Credit System
EXAMINATION 2021-22

Paper Code:MCS-403(a)
Paper Name : Cloud Computing

Objective – After completing this course the student will have an understanding of key aspects of cloud computing

Scheme of Examination

Maximum Marks: 50 Duration: 3 Hours
Minimum Passing Marks: 13
Credit: 5

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consists of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus). The word limit of part A, B and C are 50, 200 and 500 respectively

Unit I

Introduction to Cloud Computing, Services provided by cloud-SaaS, PaaS, IaaS, DaaS etc. Functioning of cloud computing, Advantages, Disadvantages, Applications, Cloud Service Providers- Amazon AWS, Google App Engine, Microsoft, VMware. Virtualization concepts, Objectives, Types of Virtualization & its benefits, Introduction to Various Virtualization OS (Hypervisor). Virtualization for Enterprises

Unit II

Designing and Implementing a Data Center-Based Cloud, Industry and International Standards for Cloud Implementation, Building private cloud using open source tools, Integration of Public and Private Cloud. Private, Public & Hybrid Clouds, their Advantages & Disadvantages, On Premises and Off Premises Cloud services, installing a Cloud service.

Unit III

Cloud Security issues - Infrastructure Security, Network level security, Host level security, Application level security, Data privacy and security Issues, Jurisdictional issues raised by Data location, Access Control, Trust, Reputation, Risk and Authentication in cloud computing

Suggested Readings

1. Cloud Computing Concepts Technology and Architecture by Thomas Erl, Prentice Hall
2. Cloud Computing principles and paradigms by Rajkumar Buyya, James Broberg and Andrzej Goscinski, John Wiley and Sons, Inc. Publication
3. Cloud Computing Theory and Practice by Dan C. Marinescu, Morgon Kaufman Publication

Masters in Computer Science (Semester System)
Choice Based Credit System
EXAMINATION 2021-22

Paper Code:MCS-403(b)
Paper Name : Internet of Things

Objective – The objective of this course is to introduce basic concepts of IOT and its applications

Scheme of Examination

Maximum Marks: 50 Duration: 3 Hours
Minimum Passing Marks: 13
Credit: 5

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consists of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus). The word limit of part A, B and C are 50, 200 and 500 respectively

Unit I

M2M to IoT : Introduction, Market Prespective, Architectural Overview. M2M to IOT Technology- Devices and gateways, Local and wide area networking, Data management, Business processes in IoT, IoT analytics, Knowledge management, IOT Architecture, Architecture Reference Model, Real world design constraints.

Unit II

IOT Use Cases- Asset Management, **Industrial Automation-** Service-oriented architecture-based device integration, SOCRADES: realizing the enterprise integrated Web of Things, IMC-AESOP: from the Web of Things to the Cloud of Things, **Commercial Building Automation-** Introduction, Case study: phase one-commercial building automation today, Case study: phase two- commercial building automation in the future.

Unit III

Internet of Things Privacy, Security and Governance Introduction, Overview of Governance, Privacy and Security Issues, Contribution from FP7 Projects, Security, IOT and Smart Cities, Privacy and Trust in IoT-Data-Platforms for Smart Cities, First Steps Towards a Secure Platform, Smartie Approach. Data Aggregation for the IoT in Smart Cities, Security

Suggested Readings

1. From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence by Jan Holler, Vlasios Tsiatsis, Catherine Mulligan, Stefan Avesand, Stamatis Karnouskos, David Boyle, 1st Edition, Academic Press, 2014.
2. Internet of Things (A Hands-on-Approach) by Vijay Madisetti and Arshdeep Bahga, 1stEdition, VPT, 2014.
3. Rethinking the Internet of Things: A Scalable Approach to Connecting Everything by Francis daCosta, 1st Edition, Apress Publications, 2013
4. Designing the Internet of Things , Adrian McEwen (Author), Hakim Cassimally
5. Internet of Things: Converging Technologies for Smart Environments and Integrated Ecosystems by Dr. Ovidiu Vermesan, Dr. Peter Friess, River Publishers
6. Internet of Things (A Hands-on-Approach) , Vijay Madisetti , Arshdeep Bahga
7. Building the internet of things with ipv6 and mipv6, The Evolving World of M2M Communications, Daniel Minoli John Wiley & Sons

Masters in Computer Science (Semester System)
Choice Based Credit System
EXAMINATION 2021-22

Paper Code:MCS-405
Paper Name : Project

Scheme of Examination

Maximum Marks: 50 Duration: 3 Hours
Minimum Passing Marks: 13

1. Marks distribution for External Project report of 40 marks is as under
   a. External Evaluation-
      i. Project Dissertation 25 marks
      ii. Presentation 10 marks
      iii. External Viva Voce 5 marks
   b. Internal Evaluation- Dissertation 10 Marks

Practical Training and Project Work:

1. Project Work may be done individually or in groups in case of bigger projects. However if project is done in group each student must be given a responsibility for a distinct module and care should be taken to monitor the individual student.
2. Project Work can be carried out in the college or outside with prior permission of college.
3. The Student must submit a synopsis of the project report to the college for approval. The Project Guide can accept the project or suggest modification for resubmission. Only on acceptance of draft project report the student should make the final copies.
4. **Project Report should be hand written.**

Submission Copy:
The Student should submit spiral bound copy of the project report.

Format of the Project:

1. **Paper:**
   The Report shall be typed on White Paper of A4 size.
2. **Final Submission:**
   The Report to be submitted must be original.
3. **Typing:**
   Font:- Times New Roman
   Heading:- 16 pt., Bold
   Subheading:- 14 pt, Bold
   Content:- 12 pt.
   Line Spacing:- 1.5 line.
   Typing Side :-One Side
   Font Color:- Black.
4. **Margins:**
   The typing must be done in the following margin:
   Left : 0.75”
   Right: 0.75”
   Top: 1”

Bottom: 1”
Left Gutter: 0.5”

5. **Binding:**
   The report shall be Spiral Bound.
6. **Title Cover:**
   The Title cover should contain the following details:
   Top: Project Title in block capitals of 16pt.
   Centre: Name of project developer’s and Guide name.
   Bottom: Name of the university, Year of submission all in block capitals of 14pt letters on separate lines with proper spacing and centering.
7. **Blank sheets:**
   At the beginning and end of the report, two white blank papers should be provided, one for the Purpose of Binding and other to be left blank.
8. **Content:**
   - **I).** Acknowledgement
   - **II).** Institute/College/Organization certificate where the project is being developed.
   - **III).** Table of contents
   - **IV).** A brief overview of project
   - **V).** Profiles of problem assigned
   - **VI).** Study of Existing System
   - **VII).** System Requirement
   - **VIII).** Project plan
     - Team Structure
     - Development Schedule
     - Programming language and Development Tools
   - **IX).** Requirement Specification
   - **X).** Design
     - Detailed DFD’s and Structure Diagram
     - Data structure, Database and File Specification
   - **XI).** Project Legacy
     - Current Status of project
     - Remaining Areas of concern
     - Technical and Managerial Lessons Learnt
     - Future Recommendations
   - Nomenclature and Abbreviations.
   - Bibliography
   - Source Code

SCHEME OF EXAMINATION
AND
SYLLABUS

M.Sc.(Computer Science) Lateral Entry
Session 2020-21

@M.G.S. UNIVERSITY, BIKANER

SCHEME OF EXAMINATION

1. ELIGIBILITY FOR ADMISSION

PGDCA from the MGS University and affiliated colleges under the jurisdiction of the university shall be eligible for admission to the M.Sc.(CS) LE Course. (Relaxation to SC/ST etc. as per State Government/University Admission Rules)

2. PASS CRITERIA

The examinee has to secure at least 36% marks to pass the examination and 25% marks in each individual paper. Even if he/she will be failed in one paper/course, he/she will be declared fail. She/he however should be allowed one more chance to take the examination as Ex-student. In such a case, the marks of practical/ tutorials etc shall be carried forward for the said purpose.

CLASSIFICATION OF SUCCESSFUL CANDIDATE

Division	**Total Marks**
First Division	60% and above
Second Division	Above 48% and below 60%
Pass	Above 36% and below 48%
Fail	Below 36%

3. INSTRUCTIONS TO PAPER SETTER

The question paper contains 3 sections. **Section-A** consists of 10 questions (2 questions from each unit of syllabus). **Section-B** consists of 10 questions (2 questions from each unit of syllabus). **Section-C** consists of 5 questions (1 question from each unit syllabus).The word limit of part A, B and C are 50, 200 and 500 respectively

4. WORKLOAD

At least 3 classes for theory class and 3 classes for practical lab should be assigned per week for each paper.

5. INSTRUCTIONS FOT PRACTICAL EXAMINATION

Marks Distribution for Practical Exam -

Each practical exam is to be conducted by two examiners one External and one Internal. External examiner should be senior lecturer from jurisdiction of MGS University. External examiner will prepare question paper of Practical Examination. Students have to perform exercise on computer. Exercise must be written in answer books in proper documentation. Marks distribution for Practical of 50 marks is as under

i) Three Exercise of 10 marks each (Logic 04, Execution 03, Documentation 03)	30 Marks
ii) Viva-Voce	10 Marks
iii) Laboratory Exercise File	10 marks

Marks distribution for Project of 100 marks is as under

i) Project Dissertation and Presentation	75 marks
ii) External Viva Voce	25 marks

Teaching and Examination scheme

Paper Code	Paper Name	Lect/ week	Tuto/ week	Exam Hours	Max. Marks	Min. Passing Marks
MCSLE-101	Mathematics for Computer Science	3	1	3	50	**13** (25%)
MCSLE-102	Software Engineering	3	1	3	50	**13** (25%)
MSCLE-103	Data Structures	3	1	3	50	**13** (25%)
MCSLE-104	Java	3	1	3	50	**13** (25%)
MCSLE-105	Internet Programming	3	1	3	50	**13** (25%)
MCSLE-106	Project	3	1	3	100	**25** (25%)
Total of Theory Papers					**350**	**126 (36% aggregate)**
Practical Papers						
PGDCA107	DS & Java Lab	3	-	3	50	**18** (25%)
PGDCA 108	Internet Programming Lab	3	-	3	50	**18** (25%)
Total of Practical Papers					**100**	**36** (36% aggregate)
Grand Total (Theory 350 + Practical 100)					**450**	**162** (36% aggregate)

Paper Code: MCSLE -101
Paper Name : Mathematics for Computer Science

Scheme of Examination

Maximum Marks: 50 Duration: 3 Hours
Minimum Passing Marks: 13

The question paper contains 3 sections. **Section-A** consists of 10 questions (2 questions from each unit of syllabus). **Section-B** consists of 10 questions (2 questions from each unit of syllabus). **Section-C** consists of 5 questions (1 question from each unit syllabus). The word limit of part A, B and C are 50, 200 and 500 respectively
Note: Non-Scientific Calculator is allowed to be used in examination.

Unit – I

Sets, different types of sets, set operations; Basic Counting Principles, Pigeonhole Principle ,Binomial Coefficients, Binomial Theorem, Permutations, Combinations

Unit - II

Matrices: addition, multiplication; Vectors: Position vector, addition, subtraction and products of vectors.

Unit -III

Mathematical Induction; Logic: Propositions and logical operations, Conditional statements, Tautologies and Contradictions, Logical Equivalence, quantifiers.

Unit - IV

Relations: Representation of Relations, Properties of relations, transitive closure; Ordered Sets: poset, Properties, Hasse Diagram, Extremal elements of posets

Unit V

Functions: Types of Functions, Asymptotic notations; Co-ordinate Systems: representation of points, straight lines, standard equation of circles.

Suggested Readings

1. Discrete Mathematics and its applications by K.H. Rosen, seventh edition
2.Discrete Mathematical Structures by Kolman, Busby and Ross, Sixth Edition, PHI.
3.Schaum'sOutline Of Theory and Problems of DiscreteMathematics, Third Edition. SEYMOUR LIPSCHUTZ
4. NCERT Mathematics textbook for class XI and XII
5. Elements of Discrete Mathematics, TMH, C L Liu
6.Foundation Mathematics for Computer Science: A Visual Approach,John Vince, Springer
7. Calculus and Analytic Geometry, George B. Thomas and Ross L. Finney, Addison Wesley

Paper Code: MCSLE -102
Paper Name : Software Engineering

Scheme of Examination

Maximum Marks: 50 Duration: 3 Hours
Minimum Passing Marks: 13

The question paper contains 3 sections. **Section-A** consists of 10 questions (2 questions from each unit of syllabus). **Section-B** consists of 10 questions (2 questions from each unit of syllabus). **Section-C** consists of 5 questions (1 question from each unit syllabus). The word limit of part A, B and C are 50, 200 and 500 respectively
Note: Scientific Calculator is allowed to be used in the examination.

Unit I

Software Engineering: Software, **Software Process**, Process Characteristics, Software Process Model- Linear Sequential Model, Prototyping Model, Spiral Model. **Software Quality**, McCall's Quality Factors. **Software Requirement Analysis and Specification (SRS)**: Need, Characteristics and Components.

Unit II

Cost Estimation: COCOMO Model, **Designing Concepts:** Design Principles, Module level concepts- Cohesion and Coupling, Design notations and specifications, Verification, Metrics.

Unit III

Object Oriented Design: Concepts, Design Notation and Specification, Design methodology, metrics. **Debugging Process:** Information Gathering, Fault Isolation, Fault Confirmation, Documentation, Fixing fault isolation.

Unit IV

Testing: Testing Fundamental, Functional Testing (Black Box), Structural Testing (White Box), Alpha And Beta Testing, Testing Object Oriented Programs, Testing Process: Comparison of Different Testing, Level of Testing. Project management for special classes of software projects: Using CASE tools, CBSE.

Unit – V

UML: An overview of UML- UML notations, UML Class diagrams- association, multiplicity, generalization, aggregation, interfaces.

Suggested Readings

1. Software Engineering: A Practitioner's Approach by Roger S. Pressman(McGraw Hill)
2. An Integrated Approach to Software Engineering By PankajJalote, (Narosa Publishing House)
3. Object-Oriented SoftwareEngineering: Practical Software Development using UML and Java By Timothy C. Lethbridge, Robert Laganière (McGraw Hill)

4. Object-Oriented Software EngineeringUsing UML, Patterns, and Java By Bernd Bruegge& Allen H. Dutoit(Prentice Hall)

Paper Code: MCSLE -103
Paper Name : Data Structures

Scheme of Examination

Maximum Marks: 50 Duration: 3 Hours
Minimum Passing Marks: 13

The question paper contains 3 sections. **Section-A** consists of 10 questions (2 questions from each unit of syllabus). **Section-B** consists of 10 questions (2 questions from each unit of syllabus). **Section-C** consists of 5 questions (1 question from each unit syllabus). The word limit of part A, B and C are 50, 200 and 500 respectively

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Unit I

Algorithm: Efficiency & Analysis Algorithm: Time and Space complexity of Algorithm. **Abstract Data Type: Linked List-** Linear, Circular, Two Way List, Basic Operation on Linked Lists, Application of Linked List.

Unit II

Stack : primitive operations, stack Application- Infix, postfix, prefix and Recursion Array and Linked Representation of Stack. **Queue:** Primitive operation, Circular Queue, Priority Queue, D-queue, Array and Linked Representation of Queue.

Unit III

Trees : Basic terminology, **Binary Tree** : Representation as Array and link List, Basic operation, **Tree Traversal** : Inorder, Preorder, Postorder, Application of Binary Tree. B-tree, Height Balance Tree (AVL Tree)

Unit IV

Graph : Basic Terminology, Directed, Undirected, Weighted, Representation of Graphs, **Graph Traversal** : Depth First Traversal, Breadth First Search.

Unit V

String handling, String class, Templates, Searching and Sorting: Searching: Linear Search, Binary Search. Sorting: Insertion Sort, Selection Sort, Quick Sort, Bubble Sort, Heap Sort, Shell Sort, Merge sort, Radix Sort, Counting Sort, Bucket Sort.

Suggested Readings

1. Expert Data Strutcture with ‘C’ By R.B Patel (Khana Book Publishing Co.(P))
2. Data structure By Lipschutz (Tata McGraw Hill)
3. Data Structure By Yashvant Kanitkar (BPB)
4. An Introduction to Data Structures with Applications By Jean-Paul Tremblay, Paul G.Sarerson (Tata McGraw Hill)
5. Data Structure Using C and C++ By Yedidyah Langsam, Moshe J.Augenstein, Arora M. Tenenbaum (Prentice- Hall India)

Paper Code: MCSLE -104
Paper Name : Java

Scheme of Examination

Maximum Marks: 50 Duration: 3 Hours
Minimum Passing Marks: 13

The question paper contains 3 sections. **Section-A** consists of 10 questions (2 questions from each unit of syllabus). **Section-B** consists of 10 questions (2 questions from each unit of syllabus). **Section-C** consists of 5 questions (1 question from each unit syllabus). The word limit of part A, B and C are 50, 200 and 500 respectively

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Unit I

Introduction to java: evolution, features, comparison with C and C++; Java program structure; tokens, keywords, constants, variables, data types, type casting, statements, Operators and Expression; Conditional Statements and Loop Statements. **Class:** syntax, instance variable, class variables, methods, constructors, overloading of constructors and methods

Unit II

Inheritance: types of inheritance, use of super, method overriding, final class, abstract class, wrapper classes.Arrays, Strings and Vectors, Packages and Interfaces, visibility controls

Unit III

Errors and Exceptions: Types of errors, Exception classes, Exception handling in java, use of try, catch, finally, throw and throws. Taking user input, Command line arguments

Unit IV

Multithreaded Programming: Creating Threads, Life cycle of thread, Thread priority, Thread synchronization, Inter-thread communication, Implementing the Runable Interface

Unit V

Swings : Classes, Working With JFrame Windows, Working With Graphics, Working With Colour, Adding And Removing Controls, Responding To Controls, Labels, Buttons, Checkbox, Checkbox Group, Choice Control, Lists, Text Field, Text Area. Menus, Dialog Box, Handling Events.

Suggested Readings

1. The Complete reference Java Ninth Edition By Herbert Schildt (Tata McGraw Hill)
2. Core Java Volume I--Fundamentals (9th Edition) by Cay S. Horstmann, Gary Cornell, Prentice Hall
3. Java: A Beginner's Guide, Sixth Edition: A Beginner's Guide by Herbert Schildt, McGraw-Hill Osborne Media
4. Programming in JAVA By E. Balagurusamy (TMH)
5. JAVA 2 programming Black Book By Steven Holzner et al. (Dreamtech Press)
6. Horstmann, Cay S. and Gary Cornell, “Core Java 2: Fundamentals Vol. 1”

Paper Code: MCSLE -105
Paper Name : Internet Programming

Scheme of Examination

Maximum Marks: 50 Duration: 3 Hours
Minimum Passing Marks: 13

The question paper contains 3 sections. **Section-A** consists of 10 questions (2 questions from each unit of syllabus). **Section-B** consists of 10 questions (2 questions from each unit of syllabus). **Section-C** consists of 5 questions (1 question from each unit syllabus). The word limit of part A, B and C are 50, 200 and 500 respectively

Unit I

Internet Basics: Evolution of Internet, Basic internet terms and applications. ISP, Anatomy of an e-mail Message, basic of sending and receiving, E-mail Protocol; Mailing List- Subscribing, Unsubscribing. Introduction to World Wide Web and its work, Web Browsers, Search Engine, Downloading, Hyper Text Transfer Protocol (HTTP), URL, Web Servers, FTP, Web publishing-Domain Name Registration, Space on Host Server for Web Site,Maintain and Updating.

Unit - II

HTML: Elements of HTML & Syntax, Comments, Headings, Paragraph, Span, Pre Tags, Backgrounds, Formatting tags, Images, Hyperlinks, div tag, List Type and its Tags, Table Layout, div, frame, Use of Forms in Web Pages.

Unit III

CSS**:**Introduction to Cascading Style Sheets, Types of Style Sheets (Inline, Internal and External), using Id andClasses, CSS properties: Background Properties, Box Model Properties, Margin, Padding, List Properties, Border Properties, Positioning Properties,

Unit - IV

Java Script: Introduction to Client Side Scripting, Introduction to Java Script, Comments, Variables in JS, Global Variables, Data types, Operators in JS, Conditions Statements (If, If Else, Switch), Java Script Loops (For Loop, While Loop, Do While Loop),

Unit V

JS Popup Boxes (Alert, Prompt, Confirm), JS Events, Onload, Onunload, Onsubmit, OnFocus, Onchange Event, Onblur Event, Onmouseover, Onclick, Ondbclick Events, JS Arrays, Working with Arrays, JS Objects, Window object, Document object, JS Functions, getElementById, innerHTML property, inner Text property, form validation, email validation.

Suggested Readings

1. Thomas A. Powell , “HTML: The Complete Reference”, Osborne/McGraw-Hill
2. Deitel, Deitel and Nieto : Internet & WWW. How to program, 2nd Edition, Pearson Education Asia.
3. E Stephen Mack, Janan Platt : HTML 4.0 , No Experience Required, 1998, BPB Publications.
4. "HTML Complete" by Sybex, BPB Publications, 2001.
5. Internet and Web Page Designing By V.K Jain (BPB)
6. Web Enabled Commercial Application Development Using HTML, DHTML , java script, Perl CGI By Ivan Bayross (BPB)

Paper Code: MCSLE -106
Paper Name : Project

Scheme of Examination

Maximum Marks: 50 Duration: 3 Hours
Minimum Passing Marks: 13

The question paper contains 3 sections. **Section-A** consists of 10 questions (2 questions from each unit of syllabus). **Section-B** consists of 10 questions (2 questions from each unit of syllabus). **Section-C** consists of 5 questions (1 question from each unit syllabus). The word limit of part A, B and C are 50, 200 and 500 respectively

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Practical Training and Project Work:

1. Project Work may be done individually or in groups in case of bigger projects(maximum two). However if project is done in group each student must be given a responsibility for a distinct module and care should be taken to monitor the individual student.
2. Project Work can be carried out in the college or outside with prior permission of college.
3. The Student must submit a synopsis of the project report to the college for approval. The Project Guide can accept the project or suggest modification for resubmission. Only on acceptance of draft project report the student should make the final copies.
4. **Project report should be hand written**

Submission Copy:
The Student should submit Spiral bound copy of the project report.
Format of the Project:

(a) **Paper:**
The Report shall be typed on White Paper of A4 size.

(b) **Final Submission:**
The Report to be submitted must be original.

(c) **Typing:**
Font:- Times New Roman
Heading:- 16 pt., Bold
Subheading:- 14 pt, Bold
Content:- 12 pt.
Line Spacing:- 1.5 line.
Typing Side :-One Side
Font Color:- Black.

(d) **Margins:**
The typing must be done in the following margin:
Left : 0.75”
Right: 0.75”
Top: 1”
Bottom: 1”
Left Gutter: 0.5”

(e) Binding:
The report shall be Spiral Bound.

(f) Title Cover:
The Title cover should contain the following details:

Top: Project Title in block capitals of 16pt.
Centre: Name of project developer's and Guide name.
Bottom: Name of the university, Year of submission all in block capitals of 14pt letters on separate lines with proper spacing and centering.

(g) **Blank sheets:**
At the beginning and end of the report, two white blank papers should be provided, one for the Purpose of Binding and other to be left blank.

(h) Content:

I). Acknowledgement
II). Institute/College/Organization certificate where the project is being developed.
III). Table of contents
IV). A brief overview of project
V). Profiles of problem assigned
VI). Study of Existing System
VII). System Requirement
VIII). Project plan
- Team Structure
- Development Schedule
- Programming language and Development Tools

IX). Requirement Specification
X). Design
- Detailed DFD's and Structure Diagram
- Data structure, Database and File Specification

XI). Project Legacy
- Current Status of project
- Remaining Areas of concern
- Technical and Managerial Lessons Learnt
- Future Recommendations

XII). Nomenclature and Abbreviations.
XIII). Bibliography
XIV). Source Code.

SCHEME OF EXAMINATION

AND

SYLLABUS

Post Graduate Diploma in Computer Application

Session 2020-21

@M.G.S. UNIVERSITY, BIKANER

Session 2020-21

SCHEME OF EXAMINATION

1. ELIGIBILITY FOR ADMISSION

Graduates of any statutory university shall be eligible for admission to the PGDCA Course. (Eligibility Marks/ Relaxation to SC/ST etc. as per Government/University Rules)

2. PASS CRITERIA

The examinee has to secure at least 36% marks to pass the examination and 25% marks in each individual paper. Even if he/she will be failed in one paper/course, he/she will be declared fail. She/he however should be allowed one more chance to take the examination as Ex-student. In such a case, the marks of practical/ tutorials etc shall be carried forward for the said purpose.

3. CLASSIFICATION OF SUCCESSFUL CANDIDATE

Division	Total Marks
First Division	60% and above
Second Division	Above 48% and below 60%
Pass	Above 36% and below 48%
Fail	Below 36%

4. INSTRUCTIONS TO PAPER SETTER

The question paper contains 3 sections. **Section-A** consists of 10 questions (2 questions from each unit of syllabus). **Section-B** consists of 10 questions (2 questions from each unit of syllabus). **Section-C** consists of 5 questions (1 question from each unit syllabus).The word limit of part A, B and C are 50, 200 and 500 respectively

5. WORKLOAD

At least 3 classes for theory class and 3 classes for practical lab should be assigned per week for each paper.

6. INSTRUCTIONS FOT PRACTICAL EXAMINATION

Marks Distribution for Practical Exam -

Each practical exam is to be conducted by two examiners one External and one Internal. External examiner should be senior lecturer from jurisdiction of MGS University. External examiner will prepare question paper of Practical Examination. Students have to perform exercise on computer. Exercise must be written in answer books in proper documentation.

Marks distribution for Practical of 50 marks is as under

i) Three Exercise of 10 marks each	30 Marks
(Logic 04, Execution 03, Documentation 03)	
ii) Viva-Voce	10 Marks
iii) Laboratory Exercise File	10 marks

Marks distribution for Project of 100 marks is as under

i) Project Dissertation and Presentation	75 marks
ii) External Viva Voce	25 marks

Teaching and Examination scheme

Paper	Paper Name(Theory)	Lect/ week	Tuto/ week	Exam Hours	Max. Marks	Min. Pass. Marks
Theory Papers						
PGDCA-101	Computer Organization	3	1	3	50	**13** (25%)
PGDCA-102	Programming with C++	3	1	3	50	**13** (25%)
PGDCA-103	Database System	3	1	3	50	**13** (25%)
PGDCA-104	Operating System	3	1	3	50	**13** (25%)
PGDCA-105	Computer Networks	3	1	3	50	**13** (25%)
Total of Theory Papers					**250**	**90** (36% aggregate)
Paper Name (Practical)						
PGDCA-106	Research Project/ Case Study	3	1	3	100	**25** (25%)
PGDCA107	C++ Lab	3		3	50	**13** (25%)
PGDCA 108	DBMS Lab	3		3	50	**13** (25%)
Total of Practical Papers					**200**	**72** (36% aggregate)

Grand Total (Theory 250 + Practical 200)	**450**	**162** (36% aggregate)

Paper Code: PGDCA-101

Paper Name : Computer Organization

Scheme of Examination

Maximum Marks: 50 Duration: 3 Hours

Minimum Passing Marks: 13

The question paper contains 3 sections. **Section-A** consists of 10 questions (2 questions from each unit of syllabus). **Section-B** consists of 10 questions (2 questions from each unit of syllabus). **Section-C** consists of 5 questions (1 question from each unit syllabus). The word limit of part A, B and C are 50, 200 and 500 respectively.

Unit I

Components of a Computer: Processor, Memory, Input-Output Unit, Difference between Organization and Architecture, Hardware Software Interaction. **Number System:** Concept of Bit and Byte, types and conversion. **Complements:** 1's complement, 2's complement. **Binary Arithmetic:** Addition, overflow, subtraction, multiplication (booth's algorithm) and division algorithm.

Unit II

Logic gates: Boolean Algebra, Map Simplification. **Combinational circuits**: Half Adder, Full Adder, Decoders, Multiplexers. **Sequential circuits:** Flip Flops- SR, JK, D, T Flip-Flop.

Unit III

Input Output Organization: Peripheral devices, I/O Interface, Asynchronous Data Transfer, Modes of Data Transfer, Direct Memory Access, I/O Processor.

Unit IV

Memory Organization: Types and capacity of Memory, Memory Hierarchy, Cache Memory, Virtual Memory.

Unit V

Intel 8085 Microprocessor: Introduction, ALU, Timing and Control Unit, Register Set, Data and Address Bus, Addressing modes, Complete Intel 8085 Instruction set, Instruction format, Opcode and Operand, Word Size, Intel 8085 programs.

Suggested Readings

1. Computer System Architecture, By M. Morris Mano (Pearson, Prentice Hall)
2. Carter Nicholas, "Computer Architecture", Schaun outline Sevies , Tata McGraw-Hill.
3. J.P. Hayes, "Computer Architecture & Organization", Tata McGraw Hill

4. Digital Computer Fundamentals By Thomas C. Batree (McGraw Hill)
5. Microprocessor Architecture, Programming, and Application With the 8085 By Ramesh Gaonkar (PENRAM)
6. Fundamentals of Microprocessor and Microcomputes By B.Ram (Danpat Rai Publications)

Paper Code: PGDCA-102

Paper Name : Programming with C++

Scheme of Examination

Maximum Marks: 50 Duration: 3 Hours

Minimum Passing Marks: 13

The question paper contains 3 sections. **Section-A** consists of 10 questions (2 questions from each unit of syllabus). **Section-B** consists of 10 questions (2 questions from each unit of syllabus). **Section-C** consists of 5 questions (1 question from each unit syllabus). The word limit of part A, B and C are 50, 200 and 500 respectively.

Unit I

Object Oriented System**:** Difference Between Procedural and Object Oriented Languages, Object Oriented Paradigm, Inheritance, Polymorphism, Abstraction, Encapsulation, Benefits and Application of Oops. Introduction to C++: Character Set, Token, Constants, Variables and Data Types, Enumeration Types, Operators, Expressions, Operator Precedence and Associatively, Input, Output, Conditional Statements, Scope of Variables, Type Conversion.

Unit II

Iteration, Break, Continue, goto; Pointers**:** Introduction, implementation advantage and disadvantage**.** Functions **-** Standard and User-Defined Function, Recursive Function, Passing By Value And Reference, Function Overloading.

Unit III

Array**:** introduction, advantage, One, Two and Multidimensional, String Processing. Class: Introduction to Class and Object, Declaring Members and Methods in a class, declaring objects.

Unit IV

Functions and objects, Inline Function, Friend Functions and Its Usage, Abstract Class, Function Overriding. Constructor and Destructor**-** Needs and Its Usage, Types of Constructors, Destructor, Static Data Members and Methods. Inheritance - Need of Inheritance, Types of Inheritance and its implementation.

Unit V

Operator Overloading: Need and Rules of Operator Overloading, Overloading Through Member Function and Friend Function. Compile Time and Run Time Polymorphism- Virtual Function and virtual class. Additional Features of C++11, C++14 and C++17.

Suggested Readings

1. Object Oriented Programming With C++ By E. Balagurusamy (Tata Mcgraw Hill)
2. C++ The Complete Reference By Herbert Sehildt (Tata Mcgraw Hill)
3. Object Oriented Programming With C++ By Schaum Series (Tata Mcgraw Hill)
4. C++11 for Programmers (Deitel Developer) by Paul J. Deitel (Author), Harvey M. Deitel, Prentice Hall; 2nd edition
5. Professional C++ by Marc Gregoire, Nicholas A. Solter and Scott J.Kleper (Goodreads Publications)
6. A Tour of C++ by Bjarne Stroustrup, 2018
7. C++17 in Detail by Bartłomiej Filipek

Paper Code: PGDCA-103

Paper Name : Database Management

Scheme of Examination

Maximum Marks: 50 Duration: 3 Hours

Minimum Passing Marks: 13

The question paper contains 3 sections. **Section-A** consists of 10 questions (2 questions from each unit of syllabus). **Section-B** consists of 10 questions (2 questions from each unit of syllabus). **Section-C** consists of 5 questions (1 question from each unit syllabus). The word limit of part A, B and C are 50, 200 and 500 respectively.

Unit I

Introduction: Charecteristics of database approach, Advantages, Database system architecture, Overview of different types of Data Models and data independence, Schemas and instances, Databse languges and interfaces; E-R Model : Entities, Attributes,keys, Relationships, Roles, Dependencies, E-R Diagram.

Unit II

Introduction to Relational model, Constraints: Domain ,Key, Entity integrity, Referential integrity; Keys: Primary, Super, Candidate, Foreign; Relational algebra: select, project, union, intersection, minus, cross product, different types of join , division operations; aggregate functions and grouping.

Unit III

SQL: Data Types, statements: select, insert, update,delete, create, alter, drop; views, SQL algebraic operations, nested queries; Stored procedures: Advantages, Variables, creating and calling procedures, if and case statements, loops, Cursors, Functions, Triggers.

Unit IV

Normalization: Definition, Functional dependencies and inference rules, 1NF, 2NF, 3NF and BCNF; Transactions processing: Definition , desirable properties of transactions, serial and non-serial schedules ,concept of serialazability , conflict-serializable schedules.

Unit V

Concurrency Control: Two-phase locking techniques, dealing with Deadlock and starvation, deadlock prevention protocols, basic timestamp ordering algorithm; Overview of database recovery techniques;concept of datawarehousing.

Suggested Readings

1. Fundamentals of Database Systems,Ramez A. Elmasri, Shamkant Navathe,5th Ed(Pearson)

2. Database System Concepts By Korth, Silberschatz, Sudarshan (Mcgraw Hill)

3. An Introduction to Database Systems By Bipin C. Desai (Galgotia Publication.)

4. SQL, PL/SQL Programming By Ivan Bayross (BPB)

5. Commercial Application Development Using Oracle Developer 2000 By Ivan Bayross (BPB)

6. http://www.mysqltutorial.org/mysql-stored-procedure-tutorial.aspx

Paper Code: PGDCA-104

Paper Name : Operating System

Scheme of Examination

Maximum Marks: 50 Duration: 3 Hours

Minimum Passing Marks: 13

The question paper contains 3 sections. **Section-A** consists of 10 questions (2 questions from each unit of syllabus). **Section-B** consists of 10 questions (2 questions from each unit of syllabus). **Section-C** consists of 5 questions (1 question from each unit syllabus). The word limit of part A, B and C are 50, 200 and 500 respectively.

Unit I

Introduction to Operating System, layered Structure, Functions, Types; Process: Concept, Process States, PCB; Threads, System calls; Process Scheduling: types of schedulers, context switch.

Unit II

CPU Scheduling, Pre-Emptive Scheduling, Scheduling Criteria- CPU Utilization, Throughput, Turnaround Time, Waiting Time, Response Time; Scheduling Algorithms- FCFS, SJF, Priority Scheduling, Round Robin Scheduling, MLQ Scheduling, MLQ With Feedback.

Unit III

Synchronization: Critical Section Problem, Requirements for a solution to the critical section problem; Semaphores,simple solution to Readers-Writers Problem. Deadlock: Characterization, Prevention, Avoidance, Banker's Algorithm, Recovery from Deadlock.

Unit IV

Memory Management: Physical and virtual address space, Paging, Overview of Segmentation;Virtual Memory Management: Concept,Page Replacement techniques- FIFO, LRU, Optimal. Linux: features of Linux, steps of Installation, Shell and kernel, Directory structure.

Unit V

Linux: Users and groups,file permissions, commands- ls, cat, cd, pwd, chmod, mkdir, rm, rmdir, mv, cp, man, apt, cal, uname, history etc. ; Installing packages; Shell scripts: writing and executing a shell script,shell variables, read and expr, decision making (if else), for and while loops.

Suggested Readings

1. Operating System Principals By Abraham Silberschatz, Peter Baer Galvin (John Wiley And Sons Inc.)

2. Operating System Concepts And Design By Milan Milen Kovic (Tata Mcgraw Hill)

3. Modern Operating System Andrew S. Tanenbaum, Herbert Bos
4. Linux in easy steps, Mike McGrath, in easy steps limited
5. Unix concepts and apllications , TMH, Sumitabha Das

Paper Code: PGDCA-105

Paper Name : Computer Networks

Scheme of Examination

Maximum Marks: 50 Duration: 3 Hours

Minimum Passing Marks: 13

The question paper contains 3 sections. **Section-A** consists of 10 questions (2 questions from each unit of syllabus). **Section-B** consists of 10 questions (2 questions from each unit of syllabus). **Section-C** consists of 5 questions (1 question from each unit syllabus). The word limit of part A, B and C are 50, 200 and 500 respectively.

Unit - I

Data Communication and Networking: Overview, Network Types, LAN Technologies, Topologies, Models- OSI Model, TCP/IP Stack, Security

Unit - II

Physical Layer: Introduction, Impariments,Performance, Digital Transmission, modes, digital to digital, analog to digital, Analog Transmission, digital to analog, analog to analog, Transmission media, Wireless Transmission, **Switching techniques:** Circuit Switching, Packet switching, Message switching.

Unit - III

Data Link Layer: Introduction, Data Link Control: Line Discipline- Enq/Ack, Poll/Select, **Flow Control** : Stop And Wait, Sliding Window, **Error Control :** ARQ, Stop and Wait ARQ, Sliding Window ARQ.

Unit - IV

Network Layer: Introduction, Network Addressing, Routing, Internetworking, Tunneling, Packet Fragmentation, Network Layer Protocols, ARP, ICMP, IPv4, IPv6

Unit V

Transport Layer: Introduction, Function, End to end communication, Transmission Control Protocol, User Datagram Protocol

Application Layer: Introduction, Client-Server Model, Application Protocols, Network Services

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Suggested Readings

1. Data Communication and Networking By Forozan (Tata McGraw Hill)
2. Data Communication And Computer Networks By Dr. Madhulika Jain, Satish Jain (BPB)
3. William Stallings, “Data and Computer Communications”, Pearson Education, 2008.

4. Rajneesh Agrawal and Bharat Bhushan Tiwari, “Data Communication and Computer Networks”, Vikas Publishing house Ltd. , 2005.
5. A. S. Tanenbaum, “Computer Networks”, Fourth Edition, Pearson Education.

Paper Code: PGDCA-106

Paper Name : Project

Scheme of Examination

Maximum Marks: 50 Duration: 3 Hours

Minimum Passing Marks: 13

Marks distribution for Project of 100 marks is as under-

i) Project Dissertation and Presentation	75 marks
ii) External Viva Voce	25 marks

Practical Training and Project Work:

1. Project Work may be done individually or in groups in case of bigger projects(maximum two). However if project is done in group each student must be given a responsibility for a distinct module and care should be taken to monitor the individual student.
2. Project Work can be carried out in the college or outside with prior permission of college.
3. The Student must submit a synopsis of the project report to the college for approval. The Project Guide can accept the project or suggest modification for resubmission. Only on acceptance of draft project report the student should make the final copies.
4. **Project report should be hand written**

Submission Copy:

The Student should submit Spiral bound copy of the project report.

Format of the Project:

(a) **Paper:**

The Report shall be typed on White Paper of A4 size.

(b) **Final Submission:**

The Report to be submitted must be original.

(c) **Typing:**

Font:- Times New Roman

Heading:- 16 pt., Bold

Subheading:- 14 pt, Bold

Content:- 12 pt.

Line Spacing:- 1.5 line.

Typing Side :-One Side

Font Color:- Black.

(d) **Margins:**

The typing must be done in the following margin:

Left : 0.75”

Right: 0.75”

Top: 1”

Bottom: 1”

Left Gutter: 0.5”

(e) Binding:

The report shall be Spiral Bound.

(f) Title Cover:

The Title cover should contain the following details:

Top: Project Title in block capitals of 16pt.

Centre: Name of project developer’s and Guide name.

Bottom: Name of the university, Year of submission all in block capitals of 14pt letters on separate lines with proper spacing and centering.

(g) **Blank sheets:**

At the beginning and end of the report, two white blank papers should be provided, one for the Purpose of Binding and other to be left blank.

(h) Content:

I). Acknowledgement

II). Institute/College/Organization certificate where the project is being developed.

III). Table of contents

IV). A brief overview of project

V). Profiles of problem assigned

VI). Study of Existing System

VII). System Requirement

VIII). Project plan

- Team Structure
- Development Schedule
- Programming language and Development Tools

IX). Requirement Specification

X). Design

- Detailed DFD's and Structure Diagram
- Data structure, Database and File Specification

XI). Project Legacy

- Current Status of project
- Remaining Areas of concern
- Technical and Managerial Lessons Learnt
- Future Recommendations

XII). Nomenclature and Abbreviations.

XIII). Bibliography

XIV). Source Code.

M.Sc. Computer Sc. (Cyber Security)
Session 2020-21
Examination 2021-22

ELIGIBILITY FOR ADMISSION

Graduates possessing 50% marks in any faculty of any statutory university who have studied Computer Science/ Computer Application as a main or vocational subject for three years shall be eligible for admission to the M.Sc. Cyber Security Course (Relaxation to SC/ST etc. as per Prevailing Rules)

PASS CRITERIA

For passing in the examination, a candidate is required to obtain at least 25% in each paper (Internal + External) and 36% marks in the total aggregate in theory and 36% marks in practical separately (in each semester examination).

CLASSIFICATION OF SUCCESSFUL CANDIDATES

As per university norms

Scheme of Examination

1. English shall be the medium of instructions and examination.
2. Examinations shall be conducted at the end of course as per the Academic Calendar notified by the Maharaja Ganga Singh University of Bikaner.

Instructions for Paper setters

3. The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consist of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus).
4. The word limit of part A, B and C are 50, 200 and 500 respectively

4.1 The duration of written examination for each paper shall be of three hours and Practical examination shall be for 3 hours duration.

4.2 The minimum attendance required by a candidate will be as per university rules.

5. With regard to dissertation/project/training, the scheme of evaluation shall be as follows:

5.1.1 The candidate has to submit a dissertation in a bound form in three copies at the end of course which would be evaluated by an external examiner. Total marks for dissertation shall be 50 (40 external + 10 internal marks).

5.1.2 The dissertation/case study/project/training/review will be evaluated at the end of course by an external examiner.

5.1.3 Students are advised to complete dissertation/project/training (Review or experimental) preferably in some outside research institute or industry or otherwise in the University.

6. An educational tour may be organized for students within or outside the State under the supervision of faculty members of the department. Traveling expenses of the teacher/s will be borne by the university as per rules.

Teaching and Examination scheme for
M.Sc. Cyber Security
Semester I

Paper Code	Paper Name	Exam Hours	Maximum Marks		Minimum passing Marks
			Internal Marks	External Marks	
MCSEC 101	Mathematical Foundations for Cyber Security	3	10	40	13
MCSEC 102	Cyber Crime, Cyber Laws and IPR	3	10	40	13
MCSEC 103	Computer Networks	3	10	40	13
MCSEC 104	C++ and Data Structures	3	10	40	13
MCSEC 105	Combined Practical	3	25	75	36
Grand Total(Theory+ Practical)				**300**	

Teaching and Examination scheme for
M.Sc. Cyber Security
Semester II

Paper Code	Paper Name	Exam Hours	Maximum Marks		Minimum passing Marks
			Internal	External	
MCSEC 201	Information Security and Cryptography	3	10	40	13
MCSEC 202	Ethical Hacking	3	10	40	13
MCSEC 203	DBMS	3	10	40	13
MCSEC 204	Python	3	10	40	13
MCSEC 205	Combined Practical	3	25	75	36
Grand Total(Theory+ Practical)				**300**	

Teaching and Examination scheme for
M.Sc. Cyber Security
Semester III

Paper Code	Paper Name	Exam Hours	Maximum Marks		Minimum passing Marks
			Internal	External	
MCSEC 301	Cyber Forensics, Audit and Investigation	3	10	40	13
MCSEC 302	Biometric Security	3	10	40	13
MCSEC 303	Wireless LAN and Mobile Computing	3	10	40	13

MCSEC 304	Operating Systems	3	10	40	13
MCSEC 305	Combined Practical	3	25	75	36
Grand Total(Theory+ Practical)				**300**	

Teaching and Examination scheme for
M.Sc. Cyber Security
Semester IV

Paper Code	Paper Name	Exam Hours	Maximum Marks		Minimum Passing Marks
			Internal	External	
MCSEC 401	Malware Analysis	3	10	40	13
MCSEC 402	Mobile and wireless security	3	10	40	13
MCSEC 403	Intrusion Detection and Prevention Systems	3	10	40	13
MCSEC 404	Project/Dissertation	3	10	40	13
MCSEC 405	Combined Practical	3	25	75	36
Grand Total(Theory+ Practical)				**300**	

Note:

Instructions for Paper setters

1. The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consist of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus).
2. Each practical exam is to be conducted by two examiners one External and one Internal. External examiner should be senior lecturer from jurisdiction of other universities. Marks distribution for Practical of 40 marks is as under
   a) Practical Examination exercise of 3 questions 30 marks
   b) Viva-Voce 5 marks
   c) Laboratory Exercise File 5 marks
3. Marks distribution for Project of 40 marks is as under
   a. External Evaluation-
      i. Project Dissertation 30 marks
      ii. Presentation 5 marks
      iii. External Viva Voce 5 marks
   b. Internal Evaluation- Dissertation 10 marks
4. The student has to complete two months career oriented summer training from any firm/organization. If the student does not get a chance to go for training, he/she can choose a research topic and can complete dissertation under the supervision of any of the faculty in his college.
5. The student who has opted training, has to provide a signed certificate from the firm/ organization authority stating that the student has spent two months as a trainee in his organization/firm. The student who has opted for dissertation, has to submit his/her dissertation report with a certificate from his supervisor.
6. In both the cases a student has to present his work in front of all the faculty members and fellow students at the starting of the next session.
7. At least 3 hours for lectures and one hour for tutorial should be allotted per week for each theory paper.
8. A slot of at least 2 hours per week should be allotted for each practical paper.

Duration: 3 Hours | Maximum Marks: 50
Minimum Passing Marks: 13

MCSEC-101 Mathematical Foundations for Cyber Security

Instructions for Paper setters

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consist of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus).

Note: Scientific Calculator may be allowed in the examination.

Unit I

Overview of Sets, Basics of counting, Permutations and Combinations, Relations-equivalence and partial orders. Concept of time complexity and asymptotic notations . **Graph Theory**: Euler graphs, Hamiltonian paths and circuits, planar graphs, rooted and binary trees, cut sets, graph colorings and applications, chromatic number, chromatic partitioning and polynomial, matching.

Unit II

Analytic Number Theory: Prime numbers, Euclid's lemma, Euclidean algorithm, basic properties of congruences, residue classes and complete residue systems, Euler-Fermat theorem, Lagrange's theorem and its applications, Chinese remainder theorem, primitive roots. Algebra: groups, cyclic groups, rings, fields, finite fields, lattices and their applications to cryptography.

Unit III

Linear Algebra: vector spaces and subspaces, linear independence, basis and dimensions, linear transformations and applications. **Probability theory**: basics, conditional probability, Bayes theorem, random variables – discrete and continuous, normal probability distribution, central limit theorem, stochastic process, Markov chain. **Coding Theory**: equivalence of codes, linear codes. Overview of Pseudorandom Number Generation.

Suggested Readings:

1. Discrete Mathematics and its applications by K. H. Rosen, seventh edition, TMH
2. Ivan Niven, Herbert S. Zuckerman, and Hugh L. Montgomery, 'An introduction to the theory of numbers', John Wiley and Sons 2004.
3. Douglas Stinson, 'Cryptography – Theory and Practice', CRC Press, 2006.
4. Sheldon M Ross, "Introduction to Probability Models", Academic Press, 2003.
5. H. Anton, "Elementary Linear Algebra", John Wiley & Sons, 2010.
6. C.L. Liu, 'Elements of Discrete mathematics', McGraw Hill, 2008.
7. Fraleigh J. B., 'A first course in abstract algebra', Narosa, 1990.
8. Joseph A. Gallian, ''Contemporary Abstract Algebra', Narosa, 1998.
9. D.S. Malik, J. Mordeson, M.K.Sen, Fundamentals of abstract algebra,TataMcGrawHill

Minimum Passing Marks: 13

MCSEC-102 Cyber Crime, Cyber Laws and IPR

Instructions for Paper setters

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consist of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus).

Unit I

Introduction to cyber crime and cyber law, cyberspace and information technology, Nature and scope of cyber crime, Jurisdiction of cybercrime. Important definitions under IT Act 2000, Cyber crime issues: unauthorized access, White collar crimes, viruses, malwares, worms, Trojans, logic bomb, Cyberstalking, voyeurism, obscenity in internet, Software piracy

Unit II

IT Act 2000, offences under IT Act and IT(amendment) Act, 2008. CRPC overview, Role Of Intermediaries, Electronic Evidence, Cyberterrorism, espionage, warfare and protection system. Overview of amended laws by the IT Act, 2000: The Indian Penal Code, 1860, The Reserve Bank of India Act 1934, Cyber Theft and the Indian Telegraph Act,1885. Digital Signatures and certificate-legal issues.

Unit III

Intellectual Property rights: Introduction to IP, Copyright, Related Rights, Trademarks, Geographical Indications, Industrial Design, Patents, Licensing and transfer of technology, WIPO Treaties , CopyrightsAct, PatentsAct, Trademark Act.

Suggested Readings:

1. Cyber Security, Cyber Crime and Cyber Forensics: Applications and Perspectives, Raghu Santanam, M. Sethumadhavan, Information Science Reference.
2. Pfleeger, Charles P.and ShariL. Pfleeger.Security in Computing, 4th Edition. Upper Saddle River, NJ:Prentice Hall,2008.
3. Cyber crime:Security and Surveillance in the Information Age,Douglas Thomas; Brian Loader.
4. Computer Crime:A Crime-Fighters Handbook by David Icove.
5. Crime in the Digital Age: Controlling Telecommunications and Cyber space Illegalities,Peter N. Grabosky.
6. Cyber law–The Indian Perspective By Pavan Duggal,Saakshar Law Publications.
7. Jonathan Rosenoer,“Cyber Law:The law of the Internet”, Springer-Verlag, 1997.
8. Mark F Grady,Fransesco Parisi,“The Law and Economics of Cyber Security”,Cambridge University Press,2006.

Duration: 3 Hours Maximum Marks: 50

Minimum Passing Marks: 13

MCSEC-103 Computer Networks

Instructions for Paper setters

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consist of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus).

Unit I

Introductory Concepts: Goals and Applications of Networks, Network structure and architecture, the OSI reference model, services, networks topology. Physical Layer: The Physical Layer, Theoretical Basis for Data Communication, Guided Transmission Media, Wireless Transmission, Overview of Digital Signal Encoding Formats, Digital Modulation – ASK, FSK, PSK, PSK, Digitization – Sampling Theorem, PCM, DM, Analog Modulation – Introducing AM, FM, PM, The Mobile Telephone System.

Unit II

The Data Link Layer: Data Link Layer Design Issues, Error Detection and Correlation, Flow Control Protocols, Stop-and-wait Flow Control, Sliding – Window Flow Control, Error Control, Stop-and-wait ARQ, Go-back-N; Example of Data Link Protocols-HDLC Medium access sub layer: Channel allocations, ALOHA Protocols, Carrier Sense Multiple Access Protocols, Ethernet, wireless LANs, BlueTooth, Data Link Layer Switching.

Unit III

Network Layer: Point-to-Point network, routing algorithms, congestion control, internetworking, Quality Control, Internetworking, The Network Layer in the Internet, IP packet, IP addresses, IPv6. Transport Layer: Design Issue, connection management, TCP window management, User Datagram Protocol, Transmission Control Protocol, Performance Issues. Application Layer: DNS, E-Mail, WWW, Multimedia, application layer protocols.

Suggested Readings

1. Forouzan, “Data Communication and Networking”, TMH, 4th Edition.

2. A.S. Tanenbaum, “Computer Networks”, PHI, 4th Edition.

3. W. Stallings, “Data and Computer Communication”, Macmillan Press.

4. Comer, “Computer Networks and Internet”, PHI. 5.Comer, “Internetworking with TCP/IP”, PHI.
5. W. Stallings, “Data and Computer Communication”, McMillan.

Duration: 3 Hours

Maximum Marks: 50
Minimum Passing Marks: 13

MCSEC-104 C++ and Data Structures

Instructions for Paper setters

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consist of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus).

Unit I

Basics : Overview of OOPs, if-else statements, loops (for, while). **Functions** : Overview, passing arguments by value and reference, recursive function, pointers. **Arrays**: Overview, array and function, array and pointers. **Class**: Overview, static data members, Inline Function, Constructors and Destructors.

Unit II

Inheritance: usage, types, compile time and run time polymorphism, overloading and overriding, virtual function, friend function, abstract class. String handling, String class, Overview of Templates. **Searching**: Linear Search, Binary Search. **Sorting:** Insertion Sort, Quick sort.

Unit III

Algorithm: Time and Space complexity of Algorithm. **Overview and applications of abstract data types:** Linked List, Stack, Queue. **Trees :** Basic terminologies. **Binary Tree** : Representation as Array, Basic operations, **Tree Traversal** : Inorder, Preorder, Postorder, Application of Binary Tree.

Suggested Readings

1. Object Oriented Programming With C++ By E. Balagurusamy (Tata Mcgraw Hill)
2. C++ The Complete Reference By Herbert Schildt (Tata Mcgraw Hill)
3. Object Oriented Programming With C++ By Schaum Series (Tata Mcgraw Hill)
4. C++11 for Programmers (Deitel Developer) by Paul J. Deitel (Author), Harvey M. Deitel, Prentice Hall; 2nd edition
5. Professional C++ by Marc Gregoire, Nicholas A. Solter and Scott J.Kleper (Goodreads Publications)
6. A Tour of C++ by Bjarne Stroustrup, 2018
7. C++17 in Detail by Bartłomiej Filipek
8. Expert Data Structure with 'C' By R.B Patel (Khana Book Publishing Co.(P))
9. Data structure By Lipschutz (Tata McGraw Hill)
10. Data Structure By Yashvant Kanitkar (BPB)
11. An Introduction to Data Structures with Applications By Jean-Paul Tremblay, Paul G.Sarerson (Tata McGraw Hill)

12. Data Structure Using C and C++ By Yedidyah Langsam, Moshe J.Augenstein, Arora M. Tenenbaum (Prentice- Hall India)

Duration: 3 Hours

Maximum Marks: 50
Minimum Passing Marks: 13

MCSEC-201 Information Security and Cryptography

Instructions for Paper setters

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consist of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus).

Unit I

Information Security: Introduction, CNSS Security Model, Components of Information System, Approaches to Information Security Implementation, The Security Systems Development Life Cycle. **Cryptography**: Concept, traditional ciphers like Caesar, Substitution, Vigenere, Transposition.

Unit II

Symmetric key Ciphers: Concept and Types, Structure and analysis of DES, Security of DES, Structure and analysis of AES. **Asymmetric key Ciphers**: Concept of public key cryptosystems, RSA algorithm, Diffie-Hellman Key exchange. **Message Authentication and Hash Functions:** Authentication requirements and functions, MAC and Hash Functions.

Unit III

MAC Algorithms: Secure Hash Algorithm, Digital signatures, Kerberos. Concept and applications of IPSec, SSL, TLS, SET, PGP and S/MIME. Concept of steganography. **Cryptanalysis:** Concept, Linear Cryptanalysis, Differential Cryptanalysis.

Suggested Readings:

1. Principles of Information Security : Michael E. Whitman, Herbert J. Mattord, CENGAGE Learning, 4th Edition.
2. Cryptography and Network Security : William Stallings, Pearson Education, 4th Edition.
3. Cryptography and Network Security : Forouzan Mukhopadhyay, McGraw Hill, 2nd Edition.

Duration: 3 Hours

Maximum Marks: 50
Minimum Passing Marks: 13

MCSEC-202 Ethical Hacking

Instructions for Paper setters

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consist of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus).

Section I

Introducing Hacking, Different types of hacking, Phases of hacking, Installation and configuration of Kali Linux, Overview of directory structure, Usage of basic commands; Malwares – Virus , Worms, Trojan; Information gathering using NMAP and ZenMAP .

Section II

Metasploit: Exploiting System Software and Privilege, Metasploit Social Engineering Attack. Working and Network analysis with Wireshark , Network and web scanning about target , Packet captures and man-in-the-Middle attacks. Hacking using different social Engineering techniques.

Section III

DoS and DDoS attacks, Hardware hacking, Hijack sessions, Hacking web servers, Website Hacking , SQL Injection and SQLMAP, Database assessment , Router and Wi-Fi attacks, different types of password attacks, phishing attacks.

Suggested Readings:

1. Basic Security Testing with Kali Linux, by Daniel Dieterle, freely available online.

2. Gray Hat Hacking The Ethical Hacker's Handbook, Branko Spasojevic, TMH, 2018.

2. Ethical Hacking and Penetration Testing Guide, by Rafay Baloch , Auerbach Publications.

3. Kali Linux Revealed,by Raphaël Hertzog, JimO'Gorman, and Mati Aharoni, offsec press,https://kali.training/downloads/Kali-Linux-Revealed-1st-edition.pdf

5. Kali Linux - An Ethical Hacker's Cookbook, by Himanshu Sharma , Packt Publishing Limited

Web resources:

1. https://nptel.ac.in/courses/106/105/106105217/

Duration: 3 Hours

Maximum Marks: 50
Minimum Passing Marks: 13

MCSEC-203 DBMS

Instructions for Paper setters

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consist of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus).

Unit I

Introduction: Characteristics of database approach, Advantages, Database system architecture, Overview of different types of Data Models and data independence, Schemas and instances, Database languages and interfaces; **E-R Model** : Entities, Attributes,keys, Relationships, Roles, Dependencies, E-R Diagram; Normalization: Definition, Functional dependencies and inference rules, 1NF, 2NF, 3NF and BCNF.

Unit II

Introduction to Relational model, Constraints: Domain, Key, Entity integrity, Referential integrity; Keys: Primary, Super, Candidate, Foreign; **Relational algebra**: select, project, union, intersection, minus, cross product, different types of join , division operations; aggregate functions and grouping**; SQL**: Data Types, statements: select, insert, update,delete, create, alter, drop; views, SQL algebraic operations, nested queries; Stored procedures: Advantages, Variables, creating and calling procedures, if and case statements, loops, Cursors, Functions, Triggers.

Unit III

Transactions processing: Definition , desirable properties of transactions, serial and non-serial schedules ,concept of serializability , conflict-serializable schedules; **Concurrency Control:** Two-phase locking techniques, dealing with Deadlock and starvation, deadlock prevention protocols, basic timestamp ordering algorithm; Overview of database recovery techniques; concept of data warehousing.

Suggested Readings:

1. Fundamentals of Database Systems,Ramez A. Elmasri, Shamkant Navathe,5th Ed(Pearson)

2. Database System Concepts By Korth, Silberschatz, Sudarshan (Mcgraw Hill)

3. An Introduction to Database Systems By Bipin C. Desai (Galgotia Publication.)

4. SQL, PL/SQL Programming By Ivan Bayross (BPB)

5. Commercial Application Development Using Oracle Developer 2000 By Ivan Bayross (BPB)

Web Resources

1. http://www.mysqltutorial.org/mysql-stored-procedure-tutorial.aspx

Duration: 3 Hours

Maximum Marks: 50
Minimum Passing Marks: 13

MCSEC-204 Python

Instructions for Paper setters

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consist of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus).

Unit I

Basics: Python Interpreter, writing code in Jupyter Notebook, Indentation, comments, importing a module, binary operators, standard scalar data types, type casting, if-else statements, loops(while, for), pass, range, ternary expressions. Data Structures and Sequences: Tuples, Lists and slicing, Built-in Sequence functions, Dictionary, Sets; List, Set, and Dict Comprehensions.

Unit II

Functions: Namespaces, Scope, and Local Functions; Returning Multiple Values, Anonymous (Lambda) Functions, Partial Argument Application, Generators, Errors and Exception handling. Basic File Handling. Objects and Methods in Python. NumPy: creating N-dimensional arrays, arithmetic with NumPy arrays, basic indexing and slicing, Psuedorandom number generation.

Unit III

Pandas: Overview of Series and DataFrames, reading data from csv file, DataFrame operations- working with data using functions like head, tail , info, shape, reshape, columns, isnull, dropna, mean, sum, describe, value_counts, corr, loc, iloc, apply. Matplotlib- plotting basic figures, subplots, line plots, bar plots, histograms, scatter plots. Overview of Scikit-learn, SciPy, networkx. Applications of python.

Suggested Readings:

1. Python for Data Analysis: Data Wrangling with Pandas, NumPy, and Ipython, by Wes McKinney, O'Reilly Media, 2017
2. Python All-in-One for Dummies, by John Shovic and Alan Simpson, John Wiley & Sons, Inc., 2019
3. Programming in Python 3: A Complete Introduction to the Python Language, Mark Summerfield, Pearson.
4. Swaroop, C. H. (2003). A Byte of Python. Python Tutorial.
5. Introduction to Computation and Programming Using Python. By John V. Guttag, MIT Press.
6. Learning Python , Mark Lutz, David Ascher, O'Reilly
7. T. Budd, Exploring Python, TMH, 1st Ed, 2011

Web Resources

1. https://www.learnpython.org/
2. https://nptel.ac.in/courses/106/106/106106212/
3. http://greenteapress.com/thinkpython/thinkpython.pdf
4. Python tutorial: https://docs.python.org/3/tutorial/index.html

Duration: 3 Hours

Maximum Marks: 50
Minimum Passing Marks: 13

MCSEC-301 Cyber Forensics, Audit and Investigation

Instructions for Paper setters

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consist of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus).

Unit I

Filesystem: CHS, LBA, HPA, write blockers, Extracting & recovering partitions, MBR, DOS partition table, Extended partition table, RAID; NTFS file system:Architecture, File creation,File deletion, Compression, encryption and indexing; Extended file systems: EXT4, Architecture, File creation, File deletion and Journaling; Other Disk structures; Windows and Linux boot process;File system acquisition and recovery.

Unit II

Windows Forensic Analysis: Window artifacts, Evidence volatility,System time, Logged on user(s), Open files, MRUs, Network information, Process information, Service information, Windows Registry, Startup tasks, Memory dumping; Document Forensics:PDF structure,PDF analysis, MS Office Document structure and analysis, Macros, Windows thumbnails.

Unit III

Mobile Forensics: SIM Card, Android architecture, Android File System, Android application; Virtual Machines, Network Forensics; Cyber crime investigation: Pre investigation,SOP for Investigation; Case scenarios:social media crime, Email investigation; CDR Analysis. Auditing: Internal Audit and IT Audit Function, IT Governance, Frameworks, Standards, and Regulations, Identifying information assets, Risk assessment and management.

Suggested Readings:

1. Computer Evidence-Collection and Preservation. Brown,C.L.T. Course Technology Cengage Learning.
2. Guide to Computer Forensics And Investigations Nelson, Bill; Phillips, Amelia; Enfinger,Frank;Steuat,Christopher Thomson Course Technology.
3. Computer Forensics–Computer Crime Scene Investigation. Vacca, John R. Charles River Media
4. Bunting, Steveand William Wei.EnCase Computer Forensics:The Official EnCE: EnCase Certified Examiner Study Guide.Sybex, 2006
5. Incident Response: Computer Forensics, Prosise, Chris, Kevin Mandia, and Matt Pepe, McGraw-Hill,2014
6. IT Security Risk Control Management:An Audit Preparation Plan,Raymond Pompon,Apress 2016
7. Carrier, Brian.File System Forensic Analysis. Addison- Wesley Professional.

Duration: 3 Hours

Maximum Marks: 50
Minimum Passing Marks: 13

MCSEC-302 Biometric Security

Instructions for Paper setters

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consist of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus).

Unit I

Biometrics: Introduction, benefits of biometrics over traditional authentication systems, benefits of biometrics in identification systems, selecting a biometric for a system, Applications, Key biometric terms and processes, biometric matching methods, Accuracy in biometric systems.

Unit II

Physiological Biometric Technologies: Fingerprints- characteristics, strengths and weaknesses; Facial scan- characteristics, strengths and weaknesses; Iris scan- characteristics, strengths and weaknesses; Retina vascular pattern- characteristics, strengths and weaknesses; Hand scan - characteristics, strengths and weaknesses; DNA biometrics.

Unit III

Behavioral Biometric Technologies: Handprint Biometrics, overview of DNA Biometrics. Signature and handwriting technology- description, classification, keyboard/keystroke dynamics; Voice- data acquisition, feature extraction, characteristics, strengths and weaknesses. Multi biometrics and multi factor biometrics.

Suggested Readings:

1. Samir Nanavathi, Michel Thieme, and Raj Nanavathi : "Biometrics -Identity verification in a network", 1st Edition, Wiley Eastern, 2002.
2. John Chirillo and Scott Blaul :"Implementing Biometric Security", 1st Edition, Wiley Eastern Publication, 2005.
3. John Berger: "Biometrics for Network Security", 1st Edition, Prentice Hall, 2004.
4. Paul Reid, Biometrics for network security, Hand book of Pearson, 2004

Duration: 3 Hours

Maximum Marks: 50
Minimum Passing Marks: 13

MCSEC-303 Wireless LAN and Mobile Computing

Instructions for Paper setters

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consist of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus).

Unit I

Wireless Networks: Introduction, Architecture, Wireless SwitchingTechnology, Wireless Communication problem, Wireless Network Reference Model, Wireless, Wireless LAN: Infrared vs radio transmission, Infrastructure and Ad-hoc Network, IEEE 802.11:System Architecture,Protocol Architecture, 802.11b, 802.11a, Bluetooth: User Scenarios, Architecture.

Unit II

Global System for Mobile Communications (GSM): Mobile Services, SystemArchitecture, Protocols, Localization & Calling, Handover, Security. GPRS: GPRS System, Architecture, UMTS: UMTS System Architecture. LTE: Long Term Evolution. Mobile Computing: Mobile communication, Mobile computing, Mobile Computing Architecture, Mobile Devices, Mobile System Networks, Mobility Management;

Unit III

Mobile Network Layer: Mobile IP: Goals, Assumptions, Entities and Terminology, IP Packet Delivery, Agent Discovery, Registration, Tunneling and Encapsulation, Optimizations, DHCP. Mobile Transport Layer: Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP, Fast retransmit/fast recovery, Transmission /time-out freezing, Selective retransmission, Transaction oriented TCP, TCP over 2.5G/3G Wireless Networks.

Suggested Readings:

1. Schiller, J. 2008. Mobile Communications. 2nd ed. India: Pearson Education.
2. Kumar,S. and Kakkasageri, M.S. “Wireless and Mobile Networks: Concepts and Protocols”, Wiley India.
3.Kamal R. 2011. “Mobile Computing”, 2ndEd.Oxford University Press.
4. Talukder, A. K., Ahmed, H. andYavagal,R.R. 2010.Mobile Computing: Technology, Applications and Service Creation, 2ndEd. Tata McGraw Hill
5.Gast, M.S. “802.11 Wireless Networks: The Definitive Guide”, O'Reilly Media.

Duration: 3 Hours

Maximum Marks: 50
Minimum Passing Marks: 13

MCSEC-304 Operating Systems

Instructions for Paper setters

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consist of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus).

Unit I

Introduction to Operating System, layered Structure, Functions, Types; Process: Concept, Process States, PCB; Threads, System calls; Process Scheduling: types of schedulers, context switch, CPU Scheduling, Pre-Emptive Scheduling, Scheduling Criteria- CPU Utilization, Throughput, Turnaround Time, Waiting Time, Response Time; Scheduling Algorithms- FCFS, SJF, Priority Scheduling, Round Robin Scheduling, MLQ Scheduling, MLQ With Feedback.

Unit II

Synchronization: Critical Section Problem, Requirements for a solution to the critical section problem; Semaphores,simple solution to Readers-Writers Problem. Deadlock: Characterization, Prevention, Avoidance, Banker's Algorithm, Recovery from Deadlock. Memory Management: Physical and virtual address space, Paging, Overview of Segmentation;Virtual Memory Management: Concept,Page Replacement techniques- FIFO, LRU, Optimal

Unit III

Linux:features of Linux, steps of Installation, Shell and kernel, Directory structure, Users and groups,file permissions, commands- ls, cat, cd, pwd, chmod, mkdir, rm, rmdir, mv, cp, man, apt, cal, uname, history etc. ; Installing packages; Shell scripts: writing and executing a shell script,shell variables, read and expr, decision making (if else,case), for and while loops.

Suggested Readings

1. Operating System Principles By Abraham Silberschatz, Peter Baer Galvin (John Wiley And Sons Inc.)
2. Operating System Concepts And Design By Milan Milen Kovic (Tata Mcgraw Hill)
3. Modern Operating System Andrew S. Tanenbaum, Herbert Bos
4. Linux in easy steps, Mike McGrath, in easy steps limited
5. Unix concepts and applications , TMH, Sumitabha Das

Duration: 3 Hours

Maximum Marks: 50
Minimum Passing Marks: 13

MCSEC-401 Malware Analysis

Instructions for Paper setters

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consist of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus).

Unit I

Introduction to malware, Types of malwares, Basic Static and Dynamic Analysis, Overview of Windows file format, PEView.exe, Patching Binaries , Disassembly(objdump, IDA Pro), Introduction to IDA, Introduction to Reverse Engineering, Extended Reverse Engineering using GDB and IDA;

Unit II

Advanced Dynamic Analysis - debugging tools and concepts, Malware Behavior - malicious activities and techniques, Analyzing Windows programs – WinAPI, Handles ,Networking , COM, Data Encoding, Malware Countermeasures , Covert Launching and Execution, Anti Analysis - Anti Disassembly, VM, Debugging;

Unit III

Packers – packing and unpacking, Intro to Kernel – Kernel basics, Windows Kernel API, Windows Drivers, Kernel Debugging, Rootkit Techniques- Hooking, Patching, Kernel Object Manipulation , Rootkit Anti-forensics , Covert analysis.

Suggested Readings:

1. Michael Sikorski and Andrew Honig, " Practical Malware Analysis", No Starch Press,2012
2. Jamie Butler and Greg Hoglund, "Rootkits: Subverting the Windows Kernel", Addison-Wesley, 2005
3. Dang, Gazet and Bachaalany, "Practical Reverse Engineering",Wiley,2014
4. Reverend Bill Blunden, "The Rootkit Arsenal: Escape and Evasion in the Dark Corners of the System" Second Edition,Jones& Bartlett, 2012.

Duration: 3 Hours

Maximum Marks: 50
Minimum Passing Marks: 13

MCSEC-402 Mobile and Wireless Security

Instructions for Paper setters

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consist of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus).

Unit I

INTRODUCTION: Security and Privacy for Mobile and Wireless Networks: Introduction- State of the Art- Areas for Future Research- General Recommendation for Research. Pervasive Systems: Enhancing Trust Negotiation with Privacy Support: Trust Negotiation- Weakness of Trust Negotiation- Extending Trust Negotiation to Support Privacy.

Unit II

MOBILE SECURITY: Mobile system architectures, Overview of mobile cellular systems, GSM and UMTS Security & Attacks, Vulnerabilities in Cellular Services, Cellular Jamming Attacks & Mitigation, Security in Cellular VoIP Services, Mobile application security. SECURING WIRELESS NETWORKS: Overview of Wireless security, Scanning and Enumerating 802.11 Networks, Attacking 802.11 Networks, Attacking WPA protected 802.11 Networks;

Unit III

Bluetooth Scanning and Reconnaissance, Bluetooth Eavesdropping, Attacking and Exploiting Bluetooth, Zigbee Security, Zigbee Attacks; ADHOC NETWORK SECURITY: Security in Ad Hoc Wireless Networks, Network Security Requirements, Issues and Challenges in Security Provisioning, Network Security Attacks, Key Management in Adhoc Wireless Networks, Secure Routing in Adhoc Wireless Networks

Suggested Readings:

1. C. Siva Ram Murthy, B.S. Manoj, “Adhoc Wireless Networks Architectures and Protocols”, Prentice Hall, x ISBN 9788131706885, 2007.
2. Noureddine Boudriga,”Security of Mobile Communications”, ISBN 9780849379413, 2010
3. KMakki, PReiher, et. al. “Mobile and Wireless Network Security and Privacy”, Springer, 2007
4. Levente Buttyan, JPHubaux. “Security and Cooperationin Wireless Networks”,Cambridge University Press,2008.

Duration: 3 Hours

Maximum Marks: 50
Minimum Passing Marks: 13

MCSEC-403 Intrusion Detection and Prevention Systems

Instructions for Paper setters

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consist of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus).

Unit I

Concept and definition , Internal and external threats to data, attacks, Need and types of IDS, Information sources Host based information sources, Network based information sources. Intrusion Prevention Systems, Network IDs protocol based IDs ,Hybrid IDs, Analysis schemes, thinking about intrusion.

Unit II

A model for intrusion analysis , techniques, types of responses mapping, responses to policy Vulnerability analysis, credential analysis, non credential analysis; Introduction to Snort, Snort Installation Scenarios, Installing Snort, Running Snort on Multiple Network Interfaces, Snort Command Line Options. Step-By-Step Procedure to Compile and Install Snort Location of Snort Files, Snort Modes Snort Alert Modes.

Unit III

Working with Snort Rules, Rule Headers, Rule Options, The SnortConfiguration File etc. Plugins, Preprocessors and Output Modules, Using Snort with MySQL,Using ACID and Snort Snarf with Snort, Agent development for intrusion detection, Architecture models of IDs and IPs.

Suggested Readings:

1. Rafeeq Rehman : " Intrusion Detection with SNORT, Apache, MySQL, PHP and ACID," 1st Edition, Prentice Hall , 2003.
2. Christopher Kruegel,Fredrik Valeur, Giovanni Vigna: "IntrusionDetection and Correlation Challenges and Solutions", 1st Edition, Springer, 2005.
3. Carl Endorf, Eugene Schultz and Jim Mellander "Intrusion Detection & Prevention", 1st Edition, Tata McGraw-Hill, 2004.
4. Stephen Northcutt, Judy Novak : "Network Intrusion Detection", 3rdEdition, New Riders Publishing, 2002.
5. T. Fahringer, R. Prodan, "A Text book on Grid Application Development and Computing Environment". 6th Edition, Khanna Publishers, 2012.

6. Ali A. Ghorbani, Wei Lu, “Network Intrusion Detection and Prevention: Concepts and Techniques”, Springer, 2010
7. Paul E. Proctor, “The Practical Intrusion Detection Handbook “,Prentice Hall , 2001.
8. Ankit Fadia and Mnu Zacharia, “Intrusion Alert”, Vikas Publishing house Pvt., Ltd, 2007
9. Earl Carter, Jonathan Hogue, “Intrusion Prevention Fundamentals”, Pearson Education, 2006.

Duration: 3 Hours Maximum Marks: 50

Minimum Passing Marks: 13

Practical Training and Project Work:

1. Project Work may be done individually or in groups in case of bigger projects. However if the project is done in a group each student must be given a responsibility for a distinct module and care should be taken to monitor the individual student.
2. Project Work can be carried out in the college or outside with prior permission of college.
3. The Student must submit a synopsis of the project report to the college for approval. The Project Guide can accept the project or suggest modification for resubmission. Only on acceptance of the draft project report the student should make the final copies.
4. **The Project Report should be hand written**

Submission Copy:

The Student should submit a spiral bound copy of the project report.

Format of the Project:

(a) Paper:

The Report shall be typed on White Paper of A4 size.

(b) Final Submission:

The Report to be submitted must be original.

(c) Typing:

Font:- Times New Roman
Heading:- 16 pt., Bold
Subheading:- 14 pt, Bold
Content:- 12 pt.
Line Spacing:- 1.5 line.
Typing Side :-One Side
Font Color:- Black.

(d) Margins:

The typing must be done in the following margin:
Left : 0.75”
Right: 0.75”
Top: 1”
Bottom: 1”
Left Gutter: 0.5”

(e) Binding:

The report shall be Spiral Bound.

(f) Title Cover:

The Title cover should contain the following details:
Top: Project Title in block capitals of 16pt.
Centre: Name of project developer’s and Guide name.
Bottom: Name of the university, Year of submission all in block capitals of 14pt letters on separate lines with proper spacing and centering.

(g) Blank sheets:

At the beginning and end of the report, two white blank papers should be provided, one for the Purpose of Binding and other to be left blank.

(h) Content:

I). Acknowledgement
II). Institute/College/Organization certificate where the project is being developed.

III). Table of contents
IV). A brief overview of project
V). Profiles of problem assigned
VI). Study of Existing System
VII). System Requirement
VIII). Project plan

- Team Structure
- Development Schedule
- Programming language and Development Tools

IX). Requirement Specification
X). Design

- Detailed DFD and Structure Diagram
- Data structure, Database and File Specification

XI). Project Legacy

- Current Status of project
- Remaining Areas of concern
- Technical and Managerial Lessons Learnt
- Future Recommendations

XII). Nomenclature and Abbreviations.
XIII). Bibliography
XIV). Source Code.

M.G.S. UNIVERSITY, BIKANER

SYLLABUS

SCHEME OF EXAMINATION AND COURSES OF STUDY

FACULTY OF LIBRARY & INFORMATION SCIENCE

BACHELOR OF LIBRARY & INFORMATION SCIENCE - 2021

BACHELOR OF LIBRARY & INFORMATION SCIENCE
MAHARAJA GANGA SINGH UNIVERSITY, BIKANER

COMMITTEE OF COURSES IN LIBRARY & INFORMATION SCIENCE

1. Shri Umesh Sharma (Convener)
2. Shri Birbal Meghwal,Government Dungar College, Bikaner (Member)
3. Shri Dharmveer Katewa, Government College, Sri Dungargarh (Member)
4. Shri Tanveer Hussain Kazri, BRG College, Sri Ganganagar (Member)
5. Shri S.R. Balan, G.H.S. Government College, Sujangarh (Member)
6. Dr. S.P. Sood , Ret. Prof. in Library Science, University of Rajasthan, Jaipur (External Member)
7. Dr. Ashwini Tiwari, In-Charge, Department of Library& Information Science, Maharshi Dayanand Saraswati University, Ajmer (External Member)

BACHELOR OF LIBRARY AND INFORMATION SCIENCE
(B.L.I.Sc PROGRAMME)

Scheme of Examination

1. **OBJECTIVE:** To train the students in the basics of professional skills and information knowledge management, so that they serve the society through an institution of library & information science. For fulfilling the main objective, the curriculum is designed to educate the students in the philosophy of librarianship, basic principles, fundamental laws, professional ethics, etc.; to enhance the students in the skills of information knowledge processing, organization and retrieval; to train them in the management of library & information centre; to enable the students to understand and appreciate the purposes of library & information centers in the changing social, cultural, technological and economic environment; to train the students in the basics of information science and technology.

2. **DURATION:** The duration of the course leading to the Degree of Bachelor of Library and Information Science (B.L.I.Sc.) shall be of one academic year. The examination shall, ordinarily, be held in the month of April/May or on such dates as may be fixed by the University.

3. The last date of receipt of admission-cum-examination forms and fees shall be fixed and notified by the University time to time.

4. **ELIGIBILITY**: A candidate who fulfils the following conditions shall be eligible to seek admission in the course:

   Who has passed graduation / P.G. in any stream with atleast 45% marks in aggregate of this University or any other University recognized as equivalent.

5. A candidate, who disqualify in any theory paper[s] and pass in all practical papers shall need to **re-appear** for all the theory papers again (except Practical Papers) in next 2 consecutive years. The marks of the practical papers will be carried forward for the next attempts. A Candidate fails in any practical paper needs to reappear in all the papers in next 2 consecutive years as Ex-student.

6. The **internal assessment awards** of a candidate who fails in any

examination shall be carried forward to the next examination concerned, provided that the candidate who has not obtained pass marks in the internal assessment for any paper(s) shall not be allowed to take examination in the said paper (s), unless he/she repeats the course in paper(s) concerned and obtains minimum pass marks in the internal assessment.

7. Twenty per cent (20%) marks, in each written and practical paper in year shall be assigned for **internal assessment**. The following criteria shall be followed for award of internal assessment:

i. The Department shall hold internal/house test of 10 marks in year for each paper. The marks obtained will be awarded to the candidate.

ii. The Department shall hold internal/house assignments of 10 or 5 marks as per paper[s] in year for each paper. The marks obtained will be awarded to the candidate.

8. A list of successful candidates shall be prepared on the basis of aggregate marks obtained in all the one year examinations, as the case may be, and shall be classified in division as under:

(a) Those who obtain 75% or more: 1st Division with Distinction

(b) Those who obtain 60% or more but less than 75%: 1st Division

(c) Those who obtain 50% or more but less than 60%: 2nd Division

(d) Those who obtain 40% or more but less than 50% : Pass.

9. The grace marks, if any, shall be awarded as per University rules concerned thereof.

10. Every student shall be examined in the subject (s) as laid down in the syllabus prescribed by the Academic Council, time to time. The question paper will be set by external/internal examiners.

The Head/In-Charge of the Department shall forward the internal assessment marks on the basis of class test, written assignment, class performance and attendance in the class, etc. to the Controller of Examinations, at least one week before the commencement of the annual examinations.

11. The **medium** of instructions and examination shall be English / Hindi.

12. The **minimum percentage of marks** to pass the examination in year

shall be -

(i) 40% in each written paper and internal assessment, etc., separately;

(ii)40% in the total of examination.

13. The amount of examination fee to be paid by a candidate shall be as decided by the University, time to time.

14. The viva-voce examination (in paper no. 9) and/or training report, wherever applicable, shall be conducted jointly by the **internal and external examiners** to be appointed by the Head / In-Charge of the Department. The marks obtained by the candidate in the internal/viva-voce shall be taken into account when he/she appears in any future examination.

Paper	Title of Paper	Internal Assessment Marks	Examination's Marks	Total Max. Marks	Duration of Theory Exam.
BLIS-1	Foundations of Library and Information Science	20	80	100	3 Hours
BLIS-2	Knowledge Organization: Classification (Theory)	20	80	100	3 Hours
BLIS-3	Knowledge Organization: Cataloguing (Theory)	20	80	100	3 Hours
BLIS-4	Management of Library Information Centers and Institutions	20	80	100	3 Hours
BLIS-5	References, Information Services and Sources	20	80	100	3 Hours
BLIS-6	Information and Communication Technology (Theory)	20	80	100	3 Hours
BLIS-7	Knowledge Organization: Classification (Practical)	15	60	75	3 Hours
BLIS-8	Knowledge Organization: Cataloguing (Practical)	15	60	75	3 Hours
BLIS-9	Information and Communication Technology (Practical)	10	40	50	2 Hours

BACHELOR OF LIBRARY AND INFORMATION SCIENCE

SYLLABUS
SESSION-2020-21

PAPER-1: FOUNDATIONS OF LIBRARY AND INFORMATIONSCIENCE

Maximum marks: 80
Pass marks: 32
Time: 3Hrs.

Note: The paper is divided into 4 units. The candidates are required to attempt 5 questions in all selecting 1 question from each unit (out of two internal choices). Question 1 is compulsory consisting of 8 short answer type questions spread over the whole syllabus. All questions carry equal marks.

Unit – I: **Libraries as Social Institutions**

Social and Historical Foundation of Library

Different Types of Libraries –Academic, Public, National, Special Libraries Characteristics, Objectives, Structure and Functions Development of Libraries with Special Reference to India

Library and Information Science Education in India

Role of Library in Formal and Informal Education

Unit – 2: Laws of Library and Information Science

Laws of Library Science

Implications of Five Laws of Library Science in Digital Environment

Unit – 3: Library Legislation and Library Profession

Library Legislation – Need and Essential Features Library Legislations in India

Intellectual Property Rights - Copyright Act, Delivery of Books Act.

Unit – 4: Professional Associations and Promoters of Library and Information Science

National Associations – ILA and IASLIC International Associations - ALA and IFLA

National Level Promoters – Raja Ram Mohan Roy Library Foundation, UGC International Level Promoters –

PAPER-2: Knowledge Organization: Classification Theory

Maximum marks: 80
Pass marks: 32
Time: 3Hrs.

Note: The paper is divided into 4 units. The candidates are required to attempt 5 questions in all selecting 1 question from each unit (out of two internal choices). Question 1 is compulsory consisting of 8 short answer type questions spread over the whole syllabus. All questions carry equal marks.

Unit – 1: Library Classification

Library Classification- Meaning, Definition, Need and Purpose,
Enumerative Classification, Almost Enumerative Classification, Almost Faceted Classification,
Detailed Study of Colon Classification, Dewey Decimal Classification - Sailent Features.
Standard Schemes of Classification and their historical developments (CC, DDC),

Unit – II: Laws and Principles of Classification

Law of interpretation, Law of impartiality, Law of Symmetry, Law of parsimony, Law of Local Variation and Law of Osmosis.
Canon of Characteristics,
Principles of Helpful Sequence.

Unit – III: Devices and Notation in Classification

Devices in CC and DDC,
Notation,
Call Number – class number, book number and collection number.

Unit – IV: Main Class

Canonical Class and Basic Class. Five Fundamental Categories, PMEST, Isolates, Common Isolate-Kinds of Common Isolates,
Phase Relation - Inter Subject, Intra Facet and Intra Array.

PAPER-3: Knowledge Organization: Cataloguing (Theory)

Maximum marks: 80
Pass marks: 32
Time: 3Hrs.

Note: The paper is divided into 4 units. The candidates are required to attempt 5 questions in all selecting 1 question from each unit (out of two internal choices). Question 1 is compulsory consisting of 8 short answer type questions spread over the whole syllabus. All questions carry equal marks.

Unit – 1: Library Cataloguing

Library Cataloguing- Need, Objectives and Types and Similar other tools: Bibliographies, indexes, accession register and shelf list.
Physical and Inner forms of Catalogue including OPAC.

Unit – II: Types of Entries

Types of Entries in CCC and AACR-2: Main Entry, Added Entries, Normative Principles of Cataloguing.

Unit – III: Subject Cataloguing

Need, Purpose and functions, Principles of subject headings,
Types of Subject Cataloguing Methods for derivation of subject headings: Chain Procedure, Sears List of Subject Headings.

Unit – IV: Codes and Standards

Comparative Study of Classified Catalogue Code with Additional Rules for Dictionary Catalogue Code and Ango-American Cataloguing Rules-2(AACR-2).
Centralized and Cooperative Cataloguing.
Current Trends in Bibliographic Standardization, Description and Exchange: ISBD(G), ISBD(S), MARC.

Paper-4: Management of Library & Information Centers

Maximum marks: 80
Pass marks: 32
Time: 3Hrs.

Unit-I **Fundamentals of Management**

Concept, Definition & Scope, Management Styles & Approaches. , Function and Principles of Scientific Management, Human Resource Management, Organizational Structure, Library Personnel. Job description and analysis, Job evaluation.
Total Quality Management (TQM)

Unit-II **Budgeting, Library Statistics & Reporting**

Budgeting: Techniques & methods – Planning, Programming Budgeting System & Zero Based Budgeting. Budgeting: Concepts, Definition, Purpose, & Functions. Annual Report –Compilation, Contents & Styles, Library Statistics.

Unit-III **Library House Keeping Operations**

Different Sections of Library & Information center and their functions. Collection Development and Management Policies, Acquisition of Reading material & their Processing. Serial Control, Circulation, Maintenance, Binding, etc. Stock verification- Policies and Procedures.

Unit-IV **Planning of building of Library & Information Centers**

Concept, Definition, Need, Purpose, Types . Policies, Procedures & Steps in Planning.
Building and Space Management. Planning of related infra structure.
Library standards, Library Rules.

Paper-5: Reference, Information Services and Sources

Maximum marks: 80
Pass marks: 32
Time: 3Hrs.

Unit-I **Reference & Information Services.**

Reference Service- Concept, Definition, Types, Reference Interview & Search Techniques .Information Services- Concept, Definition, Need, Trends and Products. Current Awareness Service (CAS) & Selective, Dissemination of Information (SDI)- Need Techniques . Bibliography Compilation and Translation Service.

Unit-II **Information Systems & Services**

National Information System: INSDOC, DECIDOC, NASSDOC, NISSAT- Their Functions, Services & Products. International Information Systems: AGRIS, MEDLARS, INSPEC-Their Function, Services & Products. Current Awareness Service (CAS) & Selective, Dissemination of Information (SDI)- Need Techniques .Bibliography Compilation and Translation Service.

Unit-III Information Users, Their Need and User Education:

Categories of Information Users. Information Needs: Definition, Models. Information Seeking Patterns. User Studies: Method, technique & Evaluation. Users Education, Goals & Objectives, Levels, Programmes, Techniques and Methods .

Unit-IV Reference and Information Sources

Documentary Sources of Information print (Ency….) and Non Print Nature, Characteristics, Utility and Evaluation of different types of Information Sources. Non Documentary Information Sources Human & Institutional Sources –Nature, Types, Characteristics & Utility Categories –Primary, Secondary & Tertiary Information Sources. Internet as a Source of Information, CD-ROM databases.

Paper-6: Information and communication technology

Maximum marks: 80
Pass marks: 32
Time: 3Hrs.

Unit-I **Fundamentals of Computers**

Historical development of computer **.**Generation of computer **.**Classification of computers: Super, Mainframe, Mini & Micro. Basic Components of computer: Input-Output device, CPU, Storage Device. Definition, Need, Components, scope, Objectives **.**Impact of IT on Society

Unit-II **Library Automation and Information Technology**

Concept, Planning and Implementations .Inhouse operations: Acquition, circulation, serial control, OPAC .Library Automation Software Packing: Their Study & Features.

Unit-III **Digital Libraries**

Genesis, Definition, Objectives, Scope .Characteristics and Nature of Collection of Digital Library

Unit-IV **Library & Information Centers Networking**

History, Concepts and Methods. LAN, WAN & MAN .Specialized Networks: NICNET, INFLIBNET, DELNET. Internet and Intranet

Paper- 7: Knowledge Organization: Classification Practical

Maximum marks: 60
Pass marks: 24
Time: 3Hrs.

Note:

Classification of documents using "Colon classification (6th rev ed.), Ranganathan, Book Number Formula" and Dewey Decimal Classification (19th ed..), representing simple, compound and complex subjects

The paper will be divided into 2 parts:

Part-I: Colon Classification (6th rev ed.)

Part-II: Dewey Decimal Classification .

In each part, 3 questions will be set as detailed below:

Part-I : Colon Classification (CC)

All questions are compulsory	30 Marks
Q.-1 Prepare Class Number using Ranganathan Book Number of Five Titles out of Eight (Simple title with Basic class & facets)	7.5Marks
Q.-2 Five title out of Eight. (Titles having Rounds & Levels of facets, system & specials)	
Q.-3 Prepare class numbers of Five titles out of Eight. (Titles using Devices, Common Isolates, Phase Relation)	10 Marks 12.5 Marks

Part-II: DDC

All questions are compulsory	30 Marks
Q.-4 Five titles out of Eight to be classified: (Simple title)	7.5 Marks
Q.-5 Five titles out of Eight to be classified: (Title using Table, standards, Table Area sub divisions, subject devices etc.)	10 Marks
Q.-6 Five titles out of Eight to be classified: (Title using various tables & devices etc.)	12.5 Marks

Paper- 8: Knowledge Organization: Cataloguing Practical

Maximum marks: 60
Pass marks: 24
Time: 3Hrs.

Practical Cataloguing of under mentioned types of document for making Classified Catalogue and a Dictionary Catalogue by using Classified Catalogue Code (5th Edition with the Amendments) and the 'Anglo-American Cataloguing Rules' II edition respectively along with 'Sears List of Subject Heading' for getting subject headings.

1. Books involving Personal, Shared and Collaborator (s) Authorship.
2. Books involving Pseudonymous Author.
3. Books involving Corporate Authorship.
4. Ordinary composite books.
5. Multivolume books
6. Periodical Publications (Simple).

Note: Complicated Foreign Personal Names, complicated periodicals and pseudoseries are to be omitted. This paper will have 5 tiles in 3 sections . All are compulsory to attempt.

First 2 titles out of three will be catalogued according to CCC (Ed 5th with Amendments) Next two titles out of three will be catalogued according to AACR-II. The last fifth title will be a Simple Periodical to be catalogued either according to CCC or AACR-II.

PAPER 9 : INFORMATION AND COMMUNICATION TECHNOLOGY (PRACTICAL)

Maximum marks: 40
Pass marks:16
Time: 2Hrs.

Note: The paper is divided into 4 units. The candidates are required to attempt 4 questions in all out of total 6 questions. All questions carry equal marks. Hands on experience with computer operation shall be preferred. The students shall be assessed by viva-voce, practical steps in the examination.

Unit 1: System Software: WINDOWS Operating System

Basics such as Desktop, My Computer, Control Panel, Windows Explorer, Accessories - Calculator and Paint.

Unit 2: Application Software: MS Word, MS PowerPoint, MS Excel

MS Word - Standard Toolbars, Creating a Document, Editing a Document, Formatting a Document, Mail Merge, Printing, etc.

MS PowerPoint - Creating Presentation Slides, Animation, Formatting / Adding Graphics, Slide Show, Customizing and Printing.

MS Excel - File creation, Editing, Inserting, Formatting, Printing, etc.

Unit 3: Library Management Software

Basics of WINISIS/SOUL

Unit 4: Online and Offline Searching

Basic Internet Searching

Advance Internet Search with Search Techniques

E-mail

Suggested Readings:

1. Ranganathan, S.R. Five Laws of Library Science, New Delhi : UBSPD, 1957.
2. Ranganathan, S.R. Library manual, Mumbai : Asia, 1959.
3. Ranganathan, S.R. Library development plan : a thirty year programme for India with draft bill New Delhi : University of Delhi, 1950
4. Ranganathan, SR, ed. Free book service for all : an international survey, Mumbai : Asia, 1969
5. Ranganathan, SR, ed. Free book service for all : an international survey, Mumbai : Asia, 1969
6. Ranganathan, SR and Neelameghan, A, ed. Public Library system. Bangalore : Sarada Ranganathan Endowment, 1972
7. Benge, Ronald. Libraries and cultural change. London : Clive Bingley, 1970.
8. Rubin, Richard E. Foundations of library and Information science, New York : Neal-Schuman, 1998
9. Hessel, A. History of Libraries Tr by Reuben Peiss. New York : Scarecrow, 1955
10. White, Carl M. Ed. Bases of modern librarianship, New York : Pergaman, 1964
11. Krishan Kumar. Library Organization, New Delhi : Vikas, 1986.
12. Davis, D.W. Public Libraries as cultural and social centre, New York : Scarecrow, 1975.

    Suggested Readings:
13. Ranganathan, SR. Library Administration. 2nd ed. Mumbai : Sarada Ranganathan Endowment for Library Science, 1989.
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Maharaja Ganga Singh University

C.E.S.D | Center for Entrepreneurship & Skill Development

YOGA

Center for Entrepreneurship and Skill Development (CESD)

Programme Structure and Codification of Papers

Three Years	B.Sc(Yogic Science)	Min. Passing Marks 48 (T) and 24 (P)	Max Passing Marks 135
I Year	BYS-1 BYS-2 BYS -3 BYS-I -P	16 16 16 24	45 45 45 65
II Year	BYS-4 BYS-5 BYS-6 BYS-II -P	16 16 16 24	45 45 45 65
III Year	BYS-7 BYS-8 BYS -9 BYS-III -P	16 16 16 24	45 45 45 65
	Total of Marks		**600**

Scheme of Examinations

1. English/Hindi shall be the medium of instructions and examination.
2. There will be yearend examination. The yearend examinations, evaluation, publication of results, award of marks statements and award of degree shall be undertaken by MGS University, Bikaner.
3. The system of evaluation shall be as follows:

3.1 Each theory paper will carry 45marks. Practical paper will carry 65 marks. Any student who fails to participate in classes, viva-voce, practical work will be debarred from appearing in the yearend examination

3.2 The duration of written examination for each paper shall be of three hours and Practical examination shall be for one day duration.

3.3 The minimum attendance required by a candidate will be as per the University rules.

4. Regular students shall be permitted to appear/reappear/improve in course as per Maharaja Ganga Singh University rules.
5. A candidate who fails in one paper except compulsory papers at the examination shall be given chance to clear the same and in that condition he/she will be considered eligible for the next higher class. If he/she fails in more than one paper, he/she will be declared as fail. If candidate who passes in practical(s) shall be exempted from reappearing in the same and marks obtained by him/her in practical(s) shall be carried forward. Pass percentage, award of Degree, Scope of improvement as per Maharaja Ganga Singh University rules or regulation for B.Sc. examination.

Affiliation: The Programme shall be governed by the CESD, Yoga, Maharaja Ganga Singh University, Bikaner, Rajasthan

B.Sc (Yogic Science)

Introduction: The aim and the Objective of the Centre is to impart the Knowledge of Yoga to the Younger Generation and the Public, for general awareness about the usefulness of Yoga in the Field of Research and Upanishad and Vedanta to make Yoga a way of life. Yoga is one such Ancient solution to modern problems. It has received great impetus during the last half century and has now spread all over the world. This had resulted in increasing the popularity of Yoga all around, but it had also led at the same time to many innovations, some desirable, but most of them undesirable. Hence, there is a need to Present Yoga in its traditional form for the benefit of the discerning Public. Yoga is not only for the use of the Student Community but also for the public at large. So, all the below mention Courses are very much in need to introduce in the University to promote Yoga.

*The students have got good opportunity in Hospitals, Schools& Colleges, Hotel industry, Resort, Self Centre for yoga therapy, Tourism field etc.

Eligibility: 10+2 from any recognized Board.
Admission: Admission shall be on the basis of Merit.
Venue:Course will be conducted at CESD, Yoga, MGSU, Bikaner.
Total seats: 40
Duration: 3Years

B.Sc (Yogic Science)

Compulsory Subjects:	Max Marks	Min. Pass Marks
1. General Hindi 3hrs.	100	36
2. General English 3hrs.	100	36
3. Elementary Computer 2hrs.	100	36
4. Environmental Studies 2hrs.	100	36

Note:1. The marks secured in Compulsory papers shall not be counted in awarding the division to a candidate.

2. Non appearing or absent in the examination of compulsory paper will be counted a chance.

B.Sc PART-I

Scheme

Three papers		**Min. Pass Marks: 48**	**Max Marks: 135**
BYS-1	**3 Hrs Duration**	**Min. Pass Marks: 16**	**45 Marks**
BYS-2	**3 Hrs Duration**	**Min. Pass Marks: 16**	**45 Marks**
BYS-3	**3 Hrs Duration**	**Min. Pass Marks: 16**	**45 Marks**
BYS-I-P	**5 Hrs**	**Min Pass Marks: 24**	**Max Marks: 65**

BYS-I: BASIC PRINCIPLE OF YOGA AND ITS RELEVANCE

Pattern of Paper Each paper is divided into 3 sections:

Section A: Consists of 10 compulsory Questions of 1.5 (one and half) mark each. Word limit Max 50 words. Selection of question of Examiner- Maximum 2 from each unit (10X1.5=15)

Section B: Consists of 5 Questions of 3 (three) mark each with internal choice. Students are required to Attempt all five questions. Word limit Max 200 words. Selection of question of Examiner- Maximum 2 from each unit (5X3=15)

Section C: Consists of 5 Essay type Questions of 5 (five) marks each. Students are required to Attempt any 3 questions. Word limit Max 500 words. Selection of question of Examiner- Maximum one from each unit (3X5=15)

Unit-I

Yoga -need of the hour, concept of Yoga, Definition of Yoga, Basics of Yoga, The Four main stream of Yoga, Gyana, Bhakti Raja and Karma Yoga, brief glimpse into each of these streams.

Unit-II

Stress & yoga, yoga for emotion culture, the science of happiness. Yoga ineducation, Yoga & personality

Unit-III

Concept of Health, Health as general understood, defined by WHO, positive Health,Dimenstion of health

Unit-IV

Heath and disease, illness according to yoga, Ayurveda,Ritucharya,Dincharyaand Tridosha.

Unit-V

Defination of Naturopahty, Illness according to Naturopathy , basic principles and tools of naturopathy.

BYS-2: HUMAN BIOLOGY andNUTRITION RELATED BIOCHEMISTRY

Pattern of Paper Each paper is divided into 3 sections:

Section A: Consists of 10 compulsory Questions of 1.5 (one and half) mark each. Word limit Max 50 words. Selection of question of Examiner- Maximum 2 from each unit (10X1.5=15)

Section B: Consists of 5 Questions of 3 (three) mark each with internal choice. Students are required to Attempt all five questions. Word limit Max 200 words. Selection of question of Examiner- Maximum 2 from each unit (5X3=15)

Section C: Consists of 5 Essay type Questions of 5 (five) marks each. Students are required to Attempt any 3 questions. Word limit Max 500 words. Selection of question of Examiner- Maximum one from each unit (3X5=15)

Unit -I

Introduction of cell, tissue, organ systemNervous system, Endocrine system., Musculo-skeletal system, Blood and lymph system, Digestive system

Unit -II

Cardio-Vascular system, Respiratory system.Immune system.Excretory system, Reproductive system, special senses.

Unit -III

Introduction to Nutrition: Food as a source of nutrients, function of food definition of nutrition, nutrient, adequate, optimum and good nutrition, Interrelationship between nutrition andhealth-visible symptoms of good health.Concept of balanced diet. Functional Food Groups: Basic four, Basic five, Basic seven.

Unit- IV

Carbohydrates: Composition, classification, food sources, functions, storage in body, recommended allowances and effects of deficiency and excess. Lipids: Composition classification, food sources,functions role of essential fatty acids, recommended allowances and effects of deficiency and excess. Lipids: composition classification, food sources,fuctions role of essential fatty acids,recommended allowances and effects of deficiency and excess. Proteins: Composition, structure and classification, denaturation of proteins, Importance of essential and non essential amino acidsElementary Knowledge of quality of portions, supplementary value of

portions, foods sources recommended allowances and effects of deficiency. **Energy:** Units of measuring energy, fuel value of food, calculation of energy. Value of diets. Factors contributing to total energy expenditure, BMR and factors affecting it, physical activity, SDA of food. Recommended allowances, effects of deficiency and excess.

Unit-V

Enzymes: Definition chemical nature, classification, co-enzymes & co-factors, deficiency and role. **Minerals :** Role in nutrition, sources, bioavailability, recommended allowances and effects of deficiency of Calcium, Iron, Iodine, Sodium, Potassium and Zinc. **Vitamins :** Definition, Classification, units of measurement functions, sources, factors affecting absorption & utilization, Recommended allowances and deficiency of (a) fat soluble vitamins A, D, E and K, (b) Water soluble Vitamins : Thiamine, Riboflavin, Niacin, folic acid, Pyridoxine and ascorbic acid. **Water:** As a nutrient, function, sources, requirement water balance,effect of deficiency.

BYS-3: INDIAN EPICS

Pattern of Paper Each paper is divided into 3 sections:

Section A: Consists of 10 compulsory Questions of 1.5 (one and half) mark each. Word limit Max 50 words. Selection of question of Examiner- Maximum 2 from each unit (10X1.5=15)

Section B: Consists of 5 Questions of 3 (three) mark each with internal choice. Students are required to Attempt all five questions. Word limit Max 200 words. Selection of question of Examiner- Maximum 2 from each unit (5X3=15)

Section C: Consists of 5 Essay type Questions of 5 (five) marks each. Students are required to Attempt any 3 questions. Word limit Max 500 words. Selection of question of Examiner- Maximum one from each unit (3X5=15)

Unit – I

Provides students with basic elementary and practical knowledge of sanskra, alphabet and phonetics.Grammar and syntax, formation and understanding of simple sentences.Common Samskrta terms used in Literature, relationship with other language.

Unit –II

Historical aspects, life sketch of Narada the author. The science of emotions culture as portrayed in NBS. Smritis(Introduction of Manu and yagyavalkyasmriti) and **the** Historical scenario of Bhagavad –Gita.

Unit –III

The key conflict of duty Vs Ethics of Arjuna. Conflict resolution, Technology - JnanaDhyana (one pointedness of mind, bliss in Yoga, control of mind perfection in Yoga.)

Unit –IV

Bhakti and Karma Yoga stream.(A Glimpse into eighteen chapters of Gita)(II & III chapters)

Unit-V

Impotant shlokas-45,4.36,4.34,2.20,6.25,6.14,6.34.6.35,6.32,6.21,6.28,8.10,6.28,

6.45,5.21,7.16,16.13,16.4,16.5,10.40,10.41,12.8,11.3,11.8,11.9,11.7,11.45,11.52,18.54,18.66,8.5,18.16,12.7,3.1,3.4,3.6,3.7,18.25,18.24,8.23,2.47,4.16,4.17,2.48,2.50,4.18,4.20,3.19,2.51,2.70,6.4,6.6,6.11,4.31,6.17,6.12,6.13,6.25,6.14,6.34,6.35,6.32,6.31,6.28,8.10,6.28,6.45,5.21*)

Practicals (BYS-I-P) B.Sc. Part –I

1. Kriyas (Shatkarma)
2. Surya Namaskar
3. SukshamaVyayama
4. Asana. (Basic set)
5. Eight step. Teaching tech. asana
6. Pranayama
7. Bandhas& Mudras
8. Omker Meditation
9. Relaxation technique[IRT,QRT,DRT]
10. Chanting
11. Yoga game
12. Emotions culture through Music, Patriotic, Service,- related songs
13. Kama yoga – Report writing
14. Presentation

Books for Reference

1. Yoga: Its basis and applications. - Dr.HR.Nagendra, SVYP, Bangalore.
2. Essence of Yoga- Swami Sivananda, The Divine life Society.
3. Light of Yoga- B.K.S Iyengar, Pub: Harper Collins India Pvt Ltd.
4. Yoga Sadhana(Hindi&English),Swami Anandananda,YogSadhna Ashram, Bapu Nagar, Jaipur(Raj.)
5. YogSikhsha(Hindi) Swami SatyanandSaraswati, Yog publication Trust, Mungare, Bihar.
6. Health&Yogasana-SwamiAnandananda, YogSadhna Ashram, Bapu Nagar, Jaipur(Raj.)
7. Pranayama-KalaAurVigyan(Hindi), Dr.H.R.Nagendra, SVYP, Banglore.
8. A Glimpse of Human Body-Dr. Shirley Telles.
9. Yoga for CommanAlliments- Dr.H.R.Nagendra, R.Nagrathan& Robin Monoro, SVYP, Banglore.
10. Yoga Way to Cure Disease, Swami SivanandaSaraswati.
11. YogDarshana(Hindi)-Geeta Press ,Gorakhpur.
12. Yogic Chiktsa(Hindi)Swami Kuva.
13. Yogdipika(Hindi), B.K.S Iyengar, Orient Longman PvtLtd,New Delhi.
14. BhagwatGeeta,Narada Bhakti Sutra,DshoUpnishad,(Hindi)Geeta Press, Gorakhpur.
15. PatanjaliYogsutra (Hindi),Yoga publication Trust, Mungare, Bihar.
16. Basic Book of Sanskrit Bharti.

*For more information : Refer to SVYP, Banglore-560 018.

B.Sc PART-II

Scheme

Three papers	**Min. Pass Marks: 48**	**Max Marks: 135**
BYS-4 3 Hrs Duration	**Min. Pass Marks: 16**	**45 Marks**
BYS-5 3 Hrs Duration	**Min. Pass Marks: 16**	**45 Marks**
BYS-6 3 Hrs Duration	**Min. Pass Marks: 16**	**45 Marks**
BYS-II-P 5 Hrs	**Min Pass Marks: 24**	**Max Marks: 65**

BYS-4: Yoga therapy(Modern & Ancient)

Pattern of Paper Each paper is divided into 3 sections:

Section A: Consists of 10 compulsory Questions of 1.5 (one and half) mark each. Word limit Max 50 words. Selection of question of Examiner- Maximum 2 from each unit (10X1.5=15)

Section B: Consists of 5 Questions of 3 (three) mark each with internal choice. Students are required to Attempt all five questions. Word limit Max 200 words. Selection of question of Examiner- Maximum 2 from each unit (5X3=15)

Section C: Consists of 5 Essay type Questions of 5 (five) marks each. Students are required to Attempt any 3 questions. Word limit Max 500 words. Selection of question of Examiner- Maximum one from each unit (3X5=15)

Unit –I

Defination,Classification,types,sign and symptoms, Causes and yoga therapy: Respiratory-Bronchial asthma, Nasal allergy,Endocrine- Diabetes mellitus, Obesity. Cardio-Vascular-Hypertension, Ischaemic heart disease.Digestive-Acid peptic pain, Irritable bowel syndrome.

Unit –II

Defination,Classification,types,sign and symptoms ,Causes and yoga therapy : cardio-Vascular-Hypertension, Ischemic heart disease. Chronic pain – Arthritis, low back pain, Migraine, Tension, Headache, Cancer.

Unit –III

Defination,Classification,types,sign and symptoms ,Causes and yoga therapy:Reproductive – Menstrual disorders, Infertility, menopause, pregnancy, Eye problems-Error of Refraction, Glaucoma, Psychiatry & Neurology – Anxiety and Depressive Neurosis, Psychosis, Epilepsy, Phobia.

Unit –IV

Remedial measures prescribed there in IAYT (Integrated Approach of Yogatherapy).The role of different Asanas,Pranayarna,Mudras, Bandha and Kiryas.

Unit –V

Concept of Adhi and Vyadhi as found in Yoga Vasistha,The manner of destruction of mind,portrayed in defferent texts of Hatha yoga for dealing with different{Hath yoga Pradipika,Gharandshmita}

BYS-5: YOGA & SPIRITUALITY

Pattern of Paper Each paper is divided into 3 sections:

Section A: Consists of 10 compulsory Questions of 1.5 (one and half) mark each. Word limit Max 50 words. Selection of question of Examiner- Maximum 2 from each unit (10X1.5=15)

Section B: Consists of 5 Questions of 3 (three) mark each with internal choice. Students are required to Attempt all five questions. Word limit Max 200 words. Selection of question of Examiner- Maximum 2 from each unit (5X3=15)

Section C: Consists of 5 Essay type Questions of 5 (five) marks each. Students are required to Attempt any 3 questions. Word limit Max 500 words. Selection of question of Examiner- Maximum one from each unit (3X5=15)

Unit –I

Upanishads the quintessence of Vedas, the basic of Yoga,[Meaning of upanishads,Imporatance, Amritnadopanishad,Ishawasyopainshad,Kathoupnishad,Chandogyaupanishad,Taittiryaupanishad,]

Unit –II

Glimpse of each Upanishads,The style of Upanishad[Shali,bhavBhasha] Harmony, Ego and beyond yogic practive.Thepranavopanishad,Prasnaupanishad, Kenopanishad,Mandukyaupanishad, Mundakaupanishad, Glimpse of each Upainshads.

Unit- III

A general survey of the life sketch, teachings and techniques of founders of various spiritual masters [Viveknand,Dayanand,MahatmaGhandi, Ravindranath Tagore,Arvind, Tilak, Vinobabhave,Ramkrishanaparamhans,]

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Unit –IV

Dharma- concept, Definition,Features,Part-1 Epics[Ramayana, Mahabart, Geeta] Improtance of Dharma, Dharma and Science. Part-II[Hindu Dharma], Ideals of Dharmas-[Guru Dharma, pitra Dharma, shishya Dharma, MatraDharmas,MitraDharma,PutraDharma,NariDharma.]

Unit –V

Comparative religions- Part-I Partially from comparative religionIslam, Christianity. Part-II-Partially from comparative religion other religion other religions, Buddhism, Jainism, Sufism,Dharma according to ancient india- Vedic kal,Uttar Vedic kal,Upanishad,Sutrakal.

BYS-6: Patanjal YOGA TEXTS

Pattern of Paper Each paper is divided into 3 sections:

Section A: Consists of 10 compulsory Questions of 1.5 (one and half) mark each. Word limit Max 50 words. Selection of question of Examiner- Maximum 2 from each unit (10X1.5=15)
Section B: Consists of 5 Questions of 3 (three) mark each with internal choice. Students are required to Attempt all five questions. Word limit Max 200 words. Selection of question of Examiner- Maximum 2 from each unit (5X3=15)
Section C: Consists of 5 Essay type Questions of 5 (five) marks each. Students are required to Attempt any 3 questions. Word limit Max 500 words. Selection of question of Examiner- Maximum one from each unit (3X5=15)

Orientation Patanjali Yoga Sutra.Pantanjali Yoga Pradeepikatext(Part-I).Sutra's 1 to 196.(SmadhiPada&SadhanaPada)

Unit-I 1 to 39 Sutra's.
Unit-II 40 to 79 Sutra's.
Unit-III 80 to118 Sutra's.
Unit-IV 119 to 157 Sutra's.
Unit-V 158 to 195Sutra's.

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Practicals (BYS-II-P) B.Sc. Part –II

1. Advance Asana
2. Advance Kriyas
3. Pranayama – II
4. Cydic Meditation
5. Yoga Game-II
6. IAYT for promotion of positive health [Basic Set]
7. [Karma Yoga II- Min.20 classes]
8. IAYT for common ailments. [Special Technique]
9. Teaching Techniques for disease [Report writing & presentation]
10. Report Writing & Presentation [Topic given by faculty]

Books for Reference

1. Essence of Yoga- Swami Sivananda, The Divine life Society.
2. Yoga Sadhana(Hindi&English),Swami Anandananda,YogSadhna Ashram, Bapu Nagar, Jaipur(Raj.)
3. Health&Yogasana-SwamiAnandananda, YogSadhna Ashram, Bapu Nagar, Jaipur(Raj.)
4. Yoga-Vivekananda Kendra Prakashna,Madras.
5. Pranayama-KalaAurVigyan(Hindi), Dr.H.R.Nagendra, SVYP, Banglore.
6. A Glimpse of Human Body-Dr. Shirley Telles.
7. Yoga for CommanAlliments- Dr.H.R.Nagendra, R.Nagrathan& Robin Monoro, SVYP, Banglore.
8. Yoga Way to Cure Disease, Swami SivanandaSaraswati.
9. YogaicChikatsa(Hindi)SwamiKuva.
10. Yogdipika(Hindi), B.K.S Iyengar, Orient Longman Pvt Ltd,New Delhi.

11. BhagwatGeeta,Narada Bhakti Sutra,DshoUpnishad,(Hindi)Geeta Press, Gorakhpur.
12. PatanjaliYogsutra(Hindi),Yoga publication Trust, Mungare, Bihar.
13. Yoga for Bronchial Asthma,Dr. R.Nagrathana&Dr.H.R.Nagendra,SVYP, Banglore-560 018.
14. Yoga for Arthritis, Dr. R.Nagrathana&Dr.H.R.Nagendra,SVYP, Banglore-560 018.
15. Yoga For Hyper Tension& Heart Disease,
16. Dr. R.Nagrathana&Dr.H.R.Nagendra, SVYP, Banglore-560 018.
17. Yoga For Pregnancy, Dr. R.Nagrathana, Dr.H.R.Nagendra&Dr,Shamantakamani-Narendran, SVYP, Banglore- 560 018
18. Yoga for Diabetic,Dr. H.S.Shrikanta, Dr. R.Nagrathana&Dr.H.R.Nagendra, SVYP, Banglore-560 018.
19. Science of Holistic Living,Vivekanand Kendra Prakashan,Chennai.
20. MuktikeChaarSopaan, Swami StyanandSaraswati, Mungare, Bihar.

*For other References: Refer to SVYP, Banglore-560 018.

B.Sc. Part III

Scheme

Three papers	**Min. Pass Marks: 48**	**Max Marks: 135**
BYS-7 3 Hrs Duration	**Min. Pass Marks: 16**	**45 Marks**
BYS-8 3 Hrs Duration	**Min. Pass Marks: 16**	**45 Marks**
BYS-9 3 Hrs Duration	**Min. Pass Marks: 16**	**45 Marks**
BYS-III-P 5 Hrs	**Min Pass Marks: 24**	**Max Marks: 65**

BYS-7:Brain-Psychology And Naturopathy

Pattern of Paper Each paper is divided into 3 sections:

Section A: Consists of 10 compulsory Questions of 1.5 (one and half) mark each. Word limit Max 50 words. Selection of question of Examiner- Maximum 2 from each unit (10X1.5=15)

Section B: Consists of 5 Questions of 3 (three) mark each with internal choice. Students are required to Attempt all five questions. Word limit Max 200 words. Selection of question of Examiner- Maximum 2 from each unit (5X3=15)

Section C: Consists of 5 Essay type Questions of 5 (five) marks each. Students are required to Attempt any 3 questions. Word limit Max 500 words. Selection of question of Examiner- Maximum one from each unit (3X5=15)

Unit – I

The nervous system, the voluntary and involuntary NS.Sympathetic and the parasympathetic NS.

Unit –II

Cognition, IQ,memory, emotions, creativities functions, memory and learning.

Unit-III

History of Naturopathy, Principals of Naturopathy, five elements-Space, Air, sun, Water, Earth.Foreign Matters-Definition, Origin, Effects on Body, Acute and chronic diseases.

Unit-IV

Definition and clinical features, Eating habit, Raw eating-method andimportance. Aims and Basis principles of Disease Prevention, Development ofPhysical, mental and spiritual health.

Unit-V

Community sanitation and hygiene water supply, environment, health lows for Food Din-charya and Ritu-charya ,health tri-doshavata pitta, kapha, smoking, tea, coffee, drinks.

BYS-8: NATURE CURE METHODS AND PRACTICE

Pattern of Paper Each paper is divided into 3 sections:

Section A: Consists of 10 compulsory Questions of 1.5 (one and half) mark each. Word limit Max 50 words. Selection of question of Examiner- Maximum 2 from each unit (10X1.5=15)

Section B: Consists of 5 Questions of 3 (three) mark each with internal choice. Students are required to Attempt all five questions. Word limit Max 200 words. Selection of question of Examiner- Maximum 2 from each unit (5X3=15)

Section C: Consists of 5 Essay type Questions of 5 (five) marks each. Students are required to Attempt any 3 questions. Word limit Max 500 words. Selection of question of Examiner- Maximum one from each unit (3X5=15)

Unit-I

Hydrotherapy- Physical properties of water, principles of hydrotherapy, physiological effects of water application on skin repiration,digestion,action and reaction. The technique of hydrotherapy water drinking, effusions, irrigation at rose, stomach colon andrectum, chest pack, trunk pack, T-packs, leg local, full wet sheet pack, hip bath, spiral bath, spinal bath, foot bath, vapour bath, and steam bath.

Unit –II

Mud therapy – type of mud, collection and properties of mud, general and local mud applications, the physiological and pathological effects and contraindication.

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Unit –III

Chromo therapy- Types of colors-primary and secondary, chromo Philosophy, chromo hygienic, limitations of chromo therapy, use of colors, limitations of chromo therapy.

Unit- IV

Fasting- definition, difference between fasting and starvation, type of fast, short fast, intermediate fast, long fast, physiological effects of fast, how start fast,how to continue and how to breakfast, methods of fasting- water, juice, saline ,fruit, partial fast, mono diet fast, nutrition and dietetics- Classifications of food and drinks, deficiency diseases, artificial food and there Ill effects, acidic and alkaline food. Digestion, absorption and assimilation.

Unit-V

Value of food in raw state, germinated form and cooked form, customs and manners of eating, combination of food, nutrition and its importance, balanced diet.Theory of massage, therapeutic use of massage, physiological effect of massage-upon skin, muscular system, circulatory system, digestive system and nervous system, massage, manipulations, hacking, stroking,percussion,petrispange,friction,tapotment,vibration and shaking

.

BYS-9: STRESS MANAGEMENT AND YOGA RESEARCH

Pattern of Paper Each paper is divided into 3 sections:

Section A: Consists of 10 compulsory Questions of 1.5 (one and half) mark each. Word limit Max 50 words. Selection of question of Examiner- Maximum 2 from each unit (10X1.5=15)

Section B: Consists of 5 Questions of 3 (three) mark each with internal choice. Students are required to Attempt all five questions. Word limit Max 200 words. Selection of question of Examiner- Maximum 2 from each unit (5X3=15)

Section C: Consists of 5 Essay type Questions of 5 (five) marks each. Students are required to Attempt any 3 questions. Word limit Max 500 words. Selection of question of Examiner- Maximum one from each unit (3X5=15)

Unit –I

Basic challenge of stress, Yogic concept of stress, Eustress and Distress, Physiology of stress. Stress induced problems and yogic management for stress.

Unit –II

Stimulation- Relaxation combine- the core. Recognitionishalf the solution.Stress levels, Stimulations and pointed of awareness. Depth of Perception and expansion of awareness.

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Unit –III

Working through the group, progress in tune with nature, A Holistic life style for the effective stress Management.

Unit –IV

~~Need for research in yoga and Yoga therapy.ResearchMethods Exploratorstudies,Pilotstudies,open ended. Prospective studies,controlstudies,randomizestudies,double blind studies.~~

Introduction:- meaning, object,significance,need,And importance of research and its scope in yoga education. Types of research,formulation and development of research problems,methods, central tendency :- objective of averaging types averages mean,mode,median, Dispersion:- measures of dispersion standard deviation and coefficient of variations .

~~**Unit –V**~~

~~Measurement parameters,error and error analysis.Reportpreparation and presentation,Dissertation,dataacquisition,analysis statistics,presentation format~~

correlation and regression ,meaning and definition of correlation. Types of correlation , methods of determining correlation. Regression analysis :- meaning and use, regression lines, regression equations, regressions coefficient and calculations , difference between correlation and regression .

Practicals(BYS-III-P) B.Sc. Part –III

Part – I Personality Assessment

1. General behavior
2. Regular and Punctuality in the class.
3. Charactor
4. Emotional stability / Maturity
5. Healthy habits and transformation (Internal

Part – II Clinical Project works

(Case study & Parameters of
Min. 8 to 10 Cases)

Part – III Presentation

Books for Reference

1. Essence of Yoga- Swami Sivananda, The Divine life Society.
2. Yoga-Vivekananda Kendra Prakashna,Madras.
3. New Perspective in Stress Management- Dr.H.R.Nagendra, SVYP, Banglore.
4. YogDarshana(Hindi)-Geeta Press ,Gorakhpur.
5. Research Methods, Dr.H.R.Nagendra& Shirley Telles,Vivekanand Kendra Yoga Prakashan,Banglore.
6. Culture and Tradition of North East India, VivekanandKendra,Kanyakumari.
7. Sure Way to Self Realization,SwamiStyanandSaraswati,yoga publication Trust ,Mungare,Bihar
8. Meditation from the Tantras, Swami StyanandSaraswati,yoga publication Trust Mungare,Bihar.
9. New perspective in Stress Management,VKYP,Banglore.

10. GeetaTatavChintan,SwamiAtmanand,LokbhartiPrakashna,Allahabad.
11. VivekanandSahitya, Vol: 1to10,AdwatAshram,Calcutta.
12. Prakartickayurvijayan, Dr. Rakeshjindle.
13. Swathyavratth. Dr. KashiNath and jagrati Sharma.

*For other References: Refer to SVYP, Banglore-560 018.

Maharaja Ganga Singh University

C.E.S.D | Center for Entrepreneurship & Skill Development

Center for Entrepreneurship and Skill Development (CESD)

Programme Structure and Codification of Papers

Full Time, Two Years	MSc (Masters in Yoga Studies and Therapy Management)	Max Internal Marks	Max Theory and Practical Marks
Previous	MYS-1: Philosophical Background of Yoga MYS-2: Principal Upanishads & Yoga Vasishtha MYS-3: Yoga and Health MYS-4: Diet and Dietary Management for Common Diseases MYS-I-P:Combined Practical (Based on theory papers)	25 25 25 25 50	75 75 75 75 100
Final	MYS-5: Sadana and Theory of HathyogaAvamPatanjali Yoga MYS-6: Psychology and its Relevance to Yoga MYS-7: Study of Yogic practices MYS-8: Research Methods and Statistic in Yoga Education MYS-II-P:Combined Practical (Based on theory papers) MYS-D: Dissertation/project/training/review/clinical project/internship/case study	25 25 25 25 50	75 75 75 75 100 100
	Total of Marks		1200

Scheme of the Papers and Marks Distribution

The **Masters in Yoga Studies and Therapy Management** (MSc) is of two years(Previous and Final) duration full time annual course. The course will have 8 theory papers (4 each year) of in all 100 marks (75 external + 25 internal marks) each, a dissertation/project/training/review/clinical project/internship/case study of 50 marks in the second year and combined practical paper based on theory papers of 150 marks (100external + 50 internal marks) in each year. The dissertation/project/training/review/clinical project/internship/case study will be evaluated by an external examiner. An educational tour may be organized for students within or outside the State under the supervision of faculty members.

Scheme of Examinations

1. English/Hindi shall be the medium of instructions and examination.
2. There will be yearend examination. The yearend examinations, evaluation, publication of results, award of marks statements and award of diploma shall be undertaken by MGS University, Bikaner.
3. The system of evaluation shall be as follows:

3.1 Each theory paper will carry 100marks (75marks external + 25marks internal). The evaluation scheme shall comprise external evaluation of 75 marks and internal evaluation of 25 marks. Practical paper will carry 150 marks (100 marks external + 50 marks internal). Any student who fails to participate in classes, viva-voce, practical work will be debarred from appearing in the end semester examination

3.2 The duration of written examination for each paper shall be of three hours and Practical examination shall be for one day duration.

3.3 The minimum attendance required by a candidate will be as per the University rules.

4. With regards to the Dissertation/project/training/review/clinical project/internship/case study, the scheme of evaluation shall be as follows:

4.1 The candidate has to submit report/thesis/dissertation/case study in a spiral/bound form in three copies which would be evaluated by an external examiner. Total marks for Project/case studies/training/dissertation/internship shall be 50.

5. Regular students shall be permitted to appear/reappear/improve in course as per Maharaja Ganga Singh University rules.
6. Pass percentage, award of degree, scope for improvement – as per Maharaja Ganga Singh University rules and regulations.

Affiliation: The Programme shall be governed by the CESD, Yoga, Maharaja Ganga Singh University, Bikaner, Rajasthan

Masters in Yoga Studies and Therapy Management (Two years)

Eligibility:

Graduate in any discipline with One year Regular Diploma/Minimum 3 months Certificate Course in Yoga with a minimum of 48% marks from Government recognized University/Recognized Institution. Or B.Sc. Naturopathy and Yogic Science with minimum 48% marks from Government recognized University/College or B.Y.N.S Five year regular course with minimum 48% marks from Government recognized University/College.

Note : Selection would be made on the basis of aggregate marks, 25% of graduation and 75% of Yoga Diploma/Certificate Courses.

No. of Seats 40

M.Sc (Masters in Yoga Studies and Therapy Management)

Previous (First) Year

Marking Scheme for External

Theory Papers	Duration	Max. Marks
MYS-1: Philosophical Background of Yoga	3 Hrs.	75
MYS-2:Principal Upanishads & Yoga Vasishtha	3 Hrs.	75
MYS-3: Yoga and Health	3 Hrs.	75
MYS-4: Diet and Dietary Management for Common Diseases	3Hrs.	75
MYS-P-I:Combined Practical	1 Day (6Hrs)	100

Detailed Syllabus for Masters in Yoga Studies and Therapy Management (Full Time Two Years)

Previous year

MYS-1: Philosophical Background of Yoga

Instructions to Paper Setters (Theory)

The paper is divided into three units. The question paper will consist of A, B and C sections. A part will consist of ten compulsory questions (at least three questions from each unit) (2 marks each). B part will consist of nine questions (three questions from each unit) and students are required to attempt five questions (5 marks each) selecting at least 1 question from each unit. C part will consist of six questions (2 questions from each unit of syllabus) and students are required to attempt three questions (10 marks each) selecting 1 question from each unit.

Unit- I

General Introduction of Sankhya Philosophy, Theory of causation, forms of satkaryavada, prakrti and it gunas, evolution and arguments for its existence, characteristic of prakrti, objection against prakrti.Purusa, and its gunas, arguments for its existence, plurality of purusas,

relationship between prakriti and purusa, theory of bondage and liberation, types of liberation, practices of yoga.

Unit- II

Geetakeanusaratmakaswaroop, shitha- pragya (ch.II) karma sidhant, Dharamkaswaroop (ch.III), Gyanki again (ch.IV), Sanyaaskaswaroop, Moksha (ch.V), Brahmagyankaupaya, AbhyaasaurBairagya, Dhyana (ch.IV), Maya kaswaroop (ch.VII), Nishkam karma yoga, Bhakti yoga, Gyana yoga (ch.XII), praviti&Nivriti (ch.XIV),

Unit- III

General introduction of Advaita Vedanta, Conception of absolute [Brahman], Conception of soul and individual soul, the nature of soul and individual soul, three states of Jiva, the relations between jiva and Brahman, three bodies of the jiva.Theory of world- Three grades of existence, [Satya], Theory of Maya, functions of Maya, characteristics of Maya, theory of causations-vivartvada, conceptions of God, the proof of existence God Theory of Bondage and liberation-concept, meaning, types of karma, knowledge and action [karma] knowledge and liberation.

Reference Books:

- ShriMadnjagwatGeetaBhashya – AcharyaSankar
- ShriMadnjagwatGeeta- Ramsukh das maharaj
- SankhayaTatvakaumudi – vachaspati Mishra
- Sankhyakarika - Ishwor Krishna Virchit
- H.P. Sinha- Outlie of Indian Philosophy
- N.K. Devraj – Indian Philosophy
- C.D. Sharny – A crtical survey of Indian Philosophy.
- J.S. Vinayaka - Indian philosophy
- H.P. Sinha - Indian Philosophy
- डॉ. डी.एन. सिंह अद्वेतऔरविषिष्टाद्वेतवेदान्त
- Bramhasutrabhasyam chapter 1,2,3,4
- Swami Atmananda- fouryogas, BharatiyavidyaBhavana. Bombay 1966
- Swami Inanananda- Philosophy of yoga, Shri Ramakrishna Ashram, Mysore
- Sing Lalan Prasad. Tntra, concept publishing Company, Delhi – 1976
- Rajkumaripandey- Bhartiya yoga pramparakevividhaAyamaRadha Publication, Delhi-1993
- Fenerstein George. The yoga Tradition: Its History, Literature, philosophy Bhavana Books and prints, Delhi 2002.

MYS-2: Principal Upanishads & Yoga Vasishtha

Instructions to Paper Setters (Theory)

The paper is divided into three units. The question paper will consist of A, B and C sections. A part will consist of ten compulsory questions (at least three questions from each unit) (2 marks each). B part will consist of nine questions (three questions from each unit) and students are required to attempt five questions (5 marks each) selecting at least 1 question from each unit. C part will consist of six questions (2 questions from each unit of syllabus) and students are required to attempt three questions (10 marks each) selecting 1 question from each unit.

Unit:-I

Principal Upanishads Brief Introduction of Ten principal Upanishads as the basis of Yogic contest; Ishavasyopanishad: Concept of Karmanishta; Concept of Vidya and Avidya; Knowledge of Brahman; AtmaBhava; KenaUpanishat: Indwelling Power; Indriya and Antahkarana; Self and the Mind; Intutive realization of the truth; Truth transcendental; Moral of YakshaUpakhyana Katha Upanishad: Definition of Yoga; Nature of Soul; Importance of Self Realization; Prashna Upanishad: Concept of Prana and rayi (creation); Panchapranas; The five main questions; Mundaka Upanishad: Two approaches to Brahma Vidya-the Para and Apara; The greatness of Brahmavidya, The worthlessness of Selfish-karma; Tapas and Gurubhakti, The origin of creation, Brahman the target of Meditation

Unit:-II

Mandukya: Four States of Consciousness and its relation to syllables in Omkara. Aitareya: Concept of Atma, Universe and Brahman.Taittiriya Upanishad Concept of PanchaKosha; Summary of ShikshaValli; AnandaValli; Bhruguvalli.Chandogya Upanishad: Om (udgitha) Meditation; Sandilyavidya, BrihadaryanakaUpanishad : Concept of Atman and Jnana Yoga. Union of Atman and Paramatman

Unit:-III

Yoga Vasishtha Highlights of Yoga Vashitha, Concept of Adhis and Vyadhis; Psychosomatic Ailments; The four Gatekeepers (Pillars) to Freedom; How Sukha is attained the Highest State of Bliss; Practices to overcome the Impediments of Yoga; Development of Satvaguna; Eight limbs of Meditation; JnanakiSaptabhumika

Reference Books

- Geeta press Gorakhpur
- Muktikeupaya- Sami NorajanandBhihar
- Yoga BhayasyVachaspati Mishra
- PatanjalyogpradeepOmanandtisth
- Yoga sutra VadhaspatiTika- Hariharnanda
- Patanjali yoga sutra- Dr.KarmbetkarLonavala.
- Yogvighyaanpradeepika-Dr.Vijey pal shashtri (Styampubilicitionhouse,newdelhi)

MYS-3: Yoga and Health

Instructions to Paper Setters (Theory)

The paper is divided into three units. The question paper will consist of A, B and C sections. A part will consist of ten compulsory questions (at least three questions from each unit) (2 marks each). B part will consist of nine questions (three questions from each unit) and students are required to attempt five questions (5 marks each) selecting at least 1 question from each unit. C part will consist of six questions (2 questions from each unit of syllabus) and students are required to attempt three questions (10 marks each) selecting 1 question from each unit.

Unit :-I

Definition & Importance of Health According to WHO; Dimensions of Health: Physical, Mental, Social and Spiritual; Concept of Health and Disease in Indian Systems of Medicine i.e. Ayurveda, Naturopathy, Yogic Concept of Health and Disease: Concept of Adhi and Vyadhi; Meaning and definitions, Concepts of Trigunas, Pancha-mahabhutas, Pancha-prana and their role in Health and Healing; Concept of Pancha-koshas& Shat-chakra and their role in Health and Healing;

Unit:-II

Role of Yoga in preventive health care – Yoga as a way of life, Heyamdukhamanagatam; Potential causes of Ill-health: Tapatrayas and Kleshas, Physical and Physiological manifestation of Disease: Vyadhi, Alasya, Angamejayatva and Ssvasaprashvasa.Mental and Emotional ill Health: Styana, Samshaya, Pramada, Avirati, Bhrantidarsana, Alabdha-bhumikatva, Anavasthitatva, Duhkha and Daurmanasya •

Unit:-III

Yogic Diet - General Introduction of Ahara; Concept of Mitahara; Classification in Yogic diet according to traditional Yoga texts;; Diet according to the body constitution (Prakriti) – Vata, Pitta and Kapha as also Gunas. • Concepts of Diet Pathya and Apathya according to GherandaSamhita,HathaPradeepika and Bhagavad Gita; Importance of Yogic Diet in YogSadhana and its role in healthy living; Diet according to the body constitution (Prakriti) – Vata, Pitta and Kapha as also Gunas. • Yogic Principles of Healthy Living: Ahara, Vihara, Achara and Vichara; Role of Yogic Positive Attitudes (Maitri, Karuna, Mudita and Upeksha) for Healthy Living, Concept of Bhavas and Bhavanas with its relevance in Health and well-being

Reference Books-

- Health and yogasana (swami anandana, yogsadnaasrambapunagerjaipur)
- Essence of yoga (swami shivananda)
- Yoga sikhsha (swami satyanandsaraswati)

- Bhagwathgeeta (geeta press Gorakhpur)
- GherandaSamhita (lonavala)
- Hatha Pradeepika(Lonavala)
- A Glimpse of Human Body – Dr Shirley Telles.
- Human Anatomy & physiology – Dr. Vrinda Singh
- Guyton A.C (1985): Function of Human Body 4th Edition
- Human Physiology – Chattergee C.C (1992)
- Text book of Physiology – Jain A.K.

MYS-4: DIET AND DIETARY MANAGEMENT FOR COMMON DISEASES

Instructions to Paper Setters (Theory)

The paper is divided into three units. The question paper will consist of A, B and C sections. A part will consist of ten compulsory questions (at least three questions from each unit) (2 marks each). B part will consist of nine questions (three questions from each unit) and students are required to attempt five questions (5 marks each) selecting at least 1 question from each unit. C part will consist of six questions (2 questions from each unit of syllabus) and students are required to attempt three questions (10 marks each) selecting 1 question from each unit.

UNIT I

Definition of the terms: Food, Nutrition, Nutrition and dietetics, Principle of diet therapy, Therapeutic. Nutrition, Planning of Therapeutic diet, Protein, Carbohydrate and Fat: Its functions, sources and effect of deficiency, energy, metabolism, Energy metabolism and water balance.

UNIT II

Minerals-Functions, effect of deficiency and excess and food sources of calcium, phosphorous, Iron, Iodine, Fluorine and sodium. Vitamin functions, food sources, effect of deficiency and excess of fat soluble vitamin A, D, E, K and water soluble vitamin B1,B2,Niacin,Folic acid and Vitamin C.

UNIT III

Planning and Dietary Modification of therapeutic diet for fever,thyphoid ,influenza,jaundice,metabolism of diabetes, diabetes diet prescription, diet for obesity and underweight, diet in disease of cardio vascular system, diet in the disease of liver, diet in disease for kidney, diet in peptic ulcer, food allergy and summary of therapeutic diet.

Reference book:

- SHILS, M.E, Olson ,J.A, Shike ,M and Ross ,A.C.(1999): Modern Nutrition in Health and Disease 9th edition.
- Williams, S.R.(1993):Nutrition andDiet Therapy 7th edition.TimesMirror,Mosbycollege,Publishing.
- Mohan,L.K,andEscolt-students (2000)Krauses food Nutrition Diet Therapy.
- Seth ,Y and Singh K.Diet Planning Through Lifestyle in Health and Disease.
- SrilakshmiS.Dietetics 1999.
- Davison,A,Passmore,R.BrockJ.F.andTruewell,A.S.Human Nutrition and Diets

MYS-I-P Practicals Previous Year

- Paper –I .Asana, Pranayama, Kriya, Bandha Mudra, Relaxation Technique etc.
- (Demonstration + Viva Voce +Teaching Technique)
- Max marks: 100
-
- Lists of Yoga Practices
- ASANA
- 1.Ardhakati Chakrasana 2.Ardha Chakrasana
- 3.Padahastasana 4.Vajrasana
- 5.Sasankasana 6..Paschimatanasana
- 7.Halasana. 8.Sarvangasana .
- 9.Matsyasana. 10.Bhujangasana .
- 11.Salabhasana. 12.ArdhaSirsasana .
- 13.Sirsasana. 14.Padmasana
- 15.Sukhasana 16.Siddhasana
- 17.Siddha yoni Asana .

- PRANAYAMA BANDHA .
- Sectional Breathing – 4,Bhastrika JalandharaBandh
- Nadisudhi, Sheetali , MoolaBandh ,uddiyanbandh
- mahabandha, agnisara
- Sithkari , Sadantaujjaiye

- MUDRA
- Chin Mudra, Chin Maya Mudra, Adhi Mudra , Brahma Mudra, sambhavi Mudra, kaki Mudra, , shanmukhi Mudra,

- KRIYA
- Kapalabhati , Trataka (Joyti, Jatru) jalanati, sutra nati ,dhoti (danda ,vastra, vaman) ,
- MEDITATION Relaxation Technique
- OM Meditation IRT (Instant Relaxation Technique)
- Cyclic Meditation DRT (Deep Relaxation Technique)

- Preksha mediation QRT (Quick Relaxation Technique)
- CHANTING
- Prayer,BhagavatGeeta(Karama yoga ,gyan yoga, raja yoga& Bhakti Yoga) Peace Chant Bhajans&patrotic song etc.

Reference Books

1. Promotion of Positive health (Dr. H.R.Nagendra)
2. Pranayama (Kala &Vigyan) (Dr.H.R.Nagendra)
3. VyasPushpanjali (SVYP) (Dr. H.R.Nagendra)
4. SMET (SVYP, Dr. H.R.Nagendra) For the common ailments all the SVYP, Disease Books

Masters in Yoga Studies and Therapy Management

Final (Second) Year

Marking Scheme for External

Theory Papers	Duration	Max. Marks
MYS-5: Sadana and Theory of Hathyoga	3 Hrs.	75
MYS-6: Psychology and its Relevance to Yoga	3 Hrs.	75
MYS-7: Study of Yogic practices and Dietary Management	3 Hrs.	75
MYS-8: Research Methods and Statistic in Yoga Education	3Hrs.	75
MYS-P-II: Combined Practical	1 Day (6Hrs)	100

MYS-5: Sadana and Theory of HathyogaAvamPatanjali Yoga
Instructions to Paper Setters (Theory)

The paper is divided into three units. The question paper will consist of A, B and C sections. A part will consist of ten compulsory questions (at least three questions from each unit) (2 marks each). B part will consist of nine questions (three questions from each unit) and students are required to attempt five questions (5 marks each) selecting at least 1 question from each unit. C part will consist of six questions (2 questions from each unit of syllabus) and students are required to attempt three questions (10 marks each) selecting 1 question from each unit.

Unit-I

Hatha Yoga Pradipika-Hath yoga kiParibhasha , Abhyaashetuuchitsthaan, Ritukal , SadhanameinSadhakevamBudhaktatva, detail of Yama – Niyama , AsanonkiVidhi ,vahLabh , Pranayama kiparibhasha , PrakarVidhi , benifits& limitations. Shatkarma -Dhoti, Basti, Neti, Nauli, Trataka , kapalabhatikevidhivahLabh , Bandh – Mudra , Mahamudra, Mahabandh,

Mahavedh, Khechari, Udiyaana , Jalandhara, Moolbandha , Viparitkarni , Vajaroli, Shaktichalani, Samadhi, Nadanusandhana , KundalinikaSwaroopevam, jagraatkeUpaya.

Unit- II

Gherandshamhita-SaptaSadhan , Shaktkarma – Dhouti , Basti, Neti, Nauli, Trataka , Kapalbhatikividhi , Sabdhaniyanvahlabh, Asana , Pranayama , Mudrayein , Pratyahara , Dharana,Dhyana& Samadhi kieVivechana, Difference between HathayogaPradipka&GharandShamhita Asana, Pranayama, kriya, adimeinantar.

Unit III

~~General introduction of Advaita Vedanta, Conception of absolute [Brahman], Conception of soul and individual soul, the nature of soul and individual soul, three states of Jiva, the relations between jiva and Brahman, three bodies of the jiva. Theory of world- Three grades of existence, [Satya], Theory of Maya, functions of Maya, characteristics of Maya, theory of causations-vivartvada, conceptions of God, the proof of existence God. Theory of Bondage and liberation-concept, meaning, types of karma, knowledge and action [karma] knowledge and liberation.~~

Yoga its meaning & nature of yoga, concept of chitta,chitta- bhumis,chitta-vrittis,chittavritinirodhaupay, abhyasa and vairagaya as the tools,concept of bhavaprataya&upaypratayaya,chitta-vikshepas (antarayas),ektatvaabhyas,chitta- prasadanam; Types and nature of Samadhi:ritambharapragya and adhyatama- prasada , sampragyat ,asampragyat, sabeeja and nirbeeja Samadhi,

Yogmargkibadhaiye or upaya, abhyasa or vairagye,kriyayog,astangyog, Concept of ishvara, theory of klesha,concept of karmas,nature of dhukha, concept of chaturviyuhavada, Drishyaaurdrashtakaswaroop,sanyogviyogkakaran, dukhkaswaroop,gunnoki char avasthaye,haankaoopaye,pragyakisaptbhumiyaa.

Introduction to astangayoga ,concept of yama and niyama, concept of dharna,dhyana and Samadhi. Siddhiyonkestrota or bhed, Concept of vasana,dharmamegh Samadhi and its result,vivekkhayati,kaivalyakaswaroop.

Reference books

1 Hathayogapradipika –PrakashakKaivalyadhamaLonavlapune
2 GharandSamhita- PrakashakKaivalyadhamaLonavlapune
3 GharandSamhita – SwaniNiranjananda
4 Hath Yoga Pradipika – Swami MuktiBodhananda
5. txnh'klgk; JhokLor& v}srosnkUr dh rkfrZrHkwfedk
6. C.D. Sharma - A critical Survey of Indian philosophy
7. J.S. Vinayaka - Indian philosophy
8. H.P. Sinha- Indian Philosophy

MYS-6: Psychology and its relevance to yoga

Instructions to Paper Setters (Theory)

The paper is divided into three units. The question paper will consist of A, B and C sections. A part will consist of ten compulsory questions (at least three questions from each unit) (2 marks each). B part will consist of nine questions (three questions from each unit) and students are required to attempt five questions (5 marks each) selecting at least 1 question from each unit. C part will consist of six questions (2 questions from each unit of syllabus) and students are required to attempt three questions (10 marks each) selecting 1 question from each unit.

Unit I

Definition of Psychology , Nature of Psychology scope of Psychology , Branches of Psychology subfields of Psychology , Utility of Psychology relation of Psychology to other fields of study , Psychology of human behaviour Psychology of spiritual growth and yogic management.

Unit II

Personality Development, its meaning and nature, Characteristic of personality, ~~Hippocrates, Kretschmer's Sheldon's ,Jung's theories of personality ,trait approach~~, developmental approach and its assessments personality according to yoga text. Education Psychology , ~~Cognitive development and languages~~ ,Motivation , Emotion , IQ its meaning, IQ testing and its controversies , Stress , its concepts , causes and Stress according to Yoga and its Challenges to Modern Science.

Unit III

Psychotherapy, definition, counselling and psychotherapy related fields, guidance clinical psychology, its categories, counsels as hagiology, helping relationship solution to human problems, counselling and guidance expectation, and goals, Approach of counselling and counselling, process of counselling and stages in the counselling process , Special areas in counselling, counselling families, reluctant clients, parents, children, Delinquent marriage, premarital, women, drug addicts, Educational counselling and vocational counselling.

Reference Books

1.Yoga Psychotherapy and its application-by Ganesh shanker.
2.Psychotherapy and Counselling -By a unit of global institute,Kolkata.
3.Counsellingtechniques,interviewing and evaluation method-Do-
4.Yoga Philosophy of Patanjali-AcharyaHarihararananda
5.Psychology East & West-Ajay Swami
6.The synthesis of Yoga –Sri Aurobindro
7.SMET –Dr.H.R.Nagendra,Dr.R .Nagarathna.
8.The Yoga Upanisad- Ayanger.T.B.Srinivas.
9.On the meaning of Transpersonel:Some metaphysical perspectives.
10. Concise Dictionary of Psychology-
11. Robert Frager James Fadian – Personality and personnel growth .
12. C.G Jung - Analytical Psychology: its theory and practice.

MYS-7: Study of Yogic Practices

Instructions to Paper Setters (Theory)

The paper is divided into three units. The question paper will consist of A, B and C sections. A part will consist of ten compulsory questions (at least three questions from each unit) (2 marks each). B part will consist of nine questions (three questions from each unit) and students are required to attempt five questions (5 marks each) selecting at least 1 question from each unit. C part will consist of six questions (2 questions from each unit of syllabus) and students are required to attempt three questions (10 marks each) selecting 1 question from each unit.

Unit-I

Asana- Definition, classification, categories, benefits & limitation. Eight step technique of asana. Technique of asana according to different text.Surya Namaskara-Technique, benefits, limitation and its mudras.Physiological effect of asana and surya-namaskar on human system.

Unit-II

Pranayama- Definition, classification, types, technique of Pranayama, benefits & limitation. Pranayama method according to different schools. Breathing practices, types, techniques, benefits and limitations. Physiological effect of various Pranayama on human body.Meditation-Definition, types, techniques of meditation.Effect of meditation on various system of human body.

UNIT- III

Bandha -Definition, Types, techniques, benefits & limitations. Physiological effects of Bandhaon various system of human body. Mudra- Definition, types, techniques, benefits & limitations. Physiological effects of Mudra on various system of Human body.Shat karma- Definition, classification, categories, benefits & limitations. Physiological effect of various shat karmas on human body.

Reference books

1. SHILS, M.E, Olson ,J.A, Shike ,M and Ross ,A.C.(1999): Modern Nutrition in Health and Disease 9th edition.
2. Williams,S.R.(1993):Nutrition andDiet Therapy 7th edition.TimesMirror,Mosbycollege,Publishing.
3. Mohan,L.K,andEscolt-students (2000)Krauses food Nutrition Diet Therapy.
4. Seth ,Y and Singh K.Diet Planning Through Lifestyle in Health and Disease.
5. SrilakshmiS.Dietetics 1999.
6. Davison,A,Passmore,R.BrockJ.F.andTruewell,A.S.Human Nutrition and Diets
7. PPH – Dr.H.R. Nagendra, Dr Nagratana
8. Asana kyoAurkaise – OM PrakashTiwari
9. Yogasana – Swami Kavalyanand
10. Text book of yoga – Yogeshwar

11. Asana , Pranamaya, band & Mudra
12. Pranamaya – Swami SatyanandaSarswati
13. Yoga in Daily life – Dr Shekar Sharma
14. Light on Yoga- B.K.S Iyengar

MYS-8: Research Methods and Statistic in Yoga Education

Instructions to Paper Setters (Theory)

The paper is divided into three units. The question paper will consist of A, B and C sections. A part will consist of ten compulsory questions (at least three questions from each unit) (2 marks each). B part will consist of nine questions (three questions from each unit) and students are required to attempt five questions (5 marks each) selecting at least 1 question from each unit. C part will consist of six questions (2 questions from each unit of syllabus) and students are required to attempt three questions (10 marks each) selecting 1 question from each unit.

Unit I

Introduction: - Meaning object, Significance, need and important of research and its scope in yoga Education. Types of research, formulation and Development of research problem, methods , central tendency :- objective of Averaging types averages mean and median .

Dispersion:-Measures of dispersion Standard Deviation and Coefficient of Variations. ~~Correlation and Regression, Meaning and Definition of Correlation.Types of correlation, methods of Determining Correction.~~

Unit-II

Correlation and Regression, Meaning and Definition of Correlation.Types of correlation, methods of Determining Correction.Regression Analysis :- meaning and use, regression lines . Regression equations, regressions Coefficient and Calculations, Difference between correlation and Regression.

Unit-III

Statistical Inference I- Sampling, Advantage of Sampling, types of sampling, sampling distribution, sampling Error, Estimation Hypothesis Testing: - Types I and Type II Error, level of significance. Statistical Inference II- test of Significance small and large sample test and (z, t, f and x^2test) Analysis of variance.

Reference Books

1. Research Methods- H.K. kapil.
2. Research Methodology. C.R. Kotar.
3. Statistical method- S.P. Gupta.
4. Statistical psychology and education – garret.
5. VagyanikMalish.-shrisatpal.
6. Research methods – Dr. H.R. NagendrasharlleyTelles V KY P. Bangalore.

MYS:D

Dissertation/project/training/review/ clinical project/internship/case study.Clinical Project Works (minimum 4 cases)/ any experimental studies/topic allotted by the faculty & Presentation

MYS-II-P Practical Final year

SukshamaVyayama, Advance Asana & Management of Yogic Practice for disease & Advance Tech for chronic ailments- PranicEnergisation Technique (PET)

SUKSHAMA VYAYAMA

1. NETRA - SAKTI - VIKASA (IMPROVING THE EYE SIGHT)
2. KOPALA - SAKTI - VARDHAKA (REJUVENATING THE CHEEKS)
3. KARNA - SAKTI - VARDHAKA (IMPROVING THE POWER OF HEARING)
4. GRIVA - SAKTI - VARDHAKA (STRENGTHENING THE NECK) 1
5. GRIVA - SAKTI - VARDHAKA (STRENGTHENING THE NECK) 2
6. GRIVA - SAKTI - VARDHAKA (STRENGTHENING THE NECK) 3
7. SKANDHA - TATHA - BAHU - MULA - SAKTI - VIKASARA(DEVELOPING THE STRENTH OF THE SHOULDER BLADE AND JOINTS)
8. BHUJA BANDHA-SAKTI-VAKASAKA (STRENGTHENING THE UPPER ARMS)
9. KAPHONI-SAKTI-VIKASAKA (STRENGTHENING THE ELBOW)
10. BHUJA-BALI-SAKTI-VIKRASARA(STRENGHTHENING THE FORE ARMS)
11. MANI-BANDHA-SAKTI -VIKASAKA (DEVELOPING THE WRISTS)
12. KARA-PRASTHA-SAKTI-VIKASAKA (DEVELOPING THE BACK OF THE HAND)
13. KARA-TALA-SAKTI-VIKASAKA (DEVELOPING THE BACK OF THE PALMS)
14. ANGULI-SAKTI-VIKASAKA (STRENGTHENING THE FINGER)
15. KATI - SAKTI - VIKASAKA (STRENGTHENING OF THE BACK) 1
16. KATI - SAKTI - VIKASAKA (STRENGTHENING OF THE BACK) 2
17. JANGHA - SAKTI - VIKASAKA (DEVELOPING THE THIGHS) -I
18. JANGHA - SAKTI - VIKASAKA (DEVELOPING THE THIGHS)-II
19. JANGHA - SAKTI - VIKASAKA (DEVELOPING THE KNEES)-III
20. PINDALI - SAKTI - VIKASAKA (DEVELOPING THE CALVES)
21. GULPHA-PADA-PRASTHA-PADA-TALA-SAKTI-VIKASAKA(DEVELOPING THE STRENGTH OF ANKLES & FEET)
22. PADA-MULA-SAKTI-VIKASAKA (DEVELOPING THE STRENGTHS OF THE SOLE)
23. PAD-ANGULI-SAKTI-VAKASAKA (DEVELOPING THE THOES)

ADVANCE ASANA

STANDING POSTURE

1. ARDHAKATI CAKRASANA
2. ARDHA CAKRASANA
3. PADA HASTASANA
4. TRIKONASANA
7. ARDHACHAKRASANA
8. GARURASANA
9. GRIVASANA
10. VRIKSANA

5. PARIVARTTA TRIKONASANA
6. PARSVA KONASANA
11.NATARAJASAN
12.BATYANASANA

SITTING POSTURE

1.VAJRASANA
2.SASANKASANA SUPTA
3.PASCIMATANASANA
4.SUPTA VAJRASANA
5.USTRASANA
6.VAKRASANA/ARDHA MATYASYENDRASANA
7.YOGA MUDRA
8.PADMASANA/BADDHA PADMASANA
9.PADA PRASAR PASCHIMATTANASANA
10.ARDHA PADMA PASCHIMATTANASANA
11.JANU SIRASANA
12.EKAPADA PADMATTANASANA
13.UTHITA JANU SIRASANA.
14.EKAPADA PADMATTANASANA
15.MAYURASANA
16.GOMUKHASANA

PRONE POSTURE

1.BHUJANGASANA
2.SALABHASANA
3.DHANURASANA
4.MAYURASANA
5.HAMSASANA
6.PADMA MAYURASANA
7.PARIPURNA NAVASANA
8.VRISCHIKASANA

SUPINE POSTURE

1.HALASASANA
2.SARVANGASANA
3.MATSYASANA
4.SETUBANDHASANA
5.BADDHA SARVANGASANA
6.EKAPA SETUBHANDHA SARVANGASANA
7.CAKRASANA
8.VIPAREETA KARANI
9.ARDHA PADMASANA
10.KARNA PIDASANA

TOPSY TURVY POSTURE

1.ARDHA SIRASASANA
2.SIRSASANA
3.SALAMBHA SIRSASANA
4.NIRLAMBHA SIRSASANA.

RELAXATION MEDITATIVE

1.TADASANA.
2.PADMASANA
3.DANDASANA.
4.SUKHASANA
5.MAKRASANA.
6.SIDDHASANA

Maharaja Ganga Singh University

C.E.S.D | Center for Entrepreneurship & Skill Development

YOGA

Center for Entrepreneurship and Skill Development (CESD)

Programme Structure and Codification of Papers

One Year	Post Graduate Diploma in Yoga and Naturopathy	Max Internal Marks	Max Theory and Practical Marks
	PGDYN-1 Foundation of Yoga **PGDYN-2Patanjali Yoga** **PGDYN-3 Human Anatomy & Physiology** **PGDYN-4 Yogic management for Diseases** **PGDYN-P Combined Practical** **(Based on theory papers)** **PGDYN-D** Dissertation/project/training/review/ clinical project/internship/case study	**25** **25** **25** **25** **50**	**75** **75** **75** **75** **100** **50**
	Total of Marks		**600**

Scheme of the Papers and Marks Distribution

The PGDYN is of one year duration full time annual course. The course will have four theory papers of 100 marks (75 external + 25 internal marks) each, a dissertation/project/training/review/clinical project/internship/case study of 50 marks and one combined practical paper based on theory papers of 150 marks (100external + 50 internal marks). The dissertation/project/training/review/clinical project/internship/case study will be evaluated at the end of course by an external examiner. An educational tour may be organized for PG diploma students within or outside the State under the supervision of faculty members.

Scheme of Examination

1. English/Hindi shall be the medium of instructions and examination.
2. There will be yearend examination. The yearend examinations, evaluation, publication of results, award of marks statements and award of diploma shall be undertaken by MGS University, Bikaner.
3. The system of evaluation shall be as follows:

3.1 Each theory paper will carry 100marks (75marks external + 25marks internal). The evaluation scheme shall comprise external evaluation of 75 marks and internal evaluation of 25 marks. Practical paper will carry 150 marks (100 marks external + 50 marks internal). Any student who fails to participate in classes, viva-voce, practical work will be debarred from appearing in the end semester examination

3.2 The duration of written examination for each paper shall be of three hours and Practical examination shall be for one day duration.

3.3 The minimum attendance required by a candidate will be as per the University rules.

4. With regards to the Dissertation/project/training/review/clinical project/internship/case study, the scheme of evaluation shall be as follows:

4.1 The candidate has to submit report/thesis/dissertation/case study in a spiral/bound form in three copies which would be evaluated by an external examiner. Total marks for Project/case studies/training/dissertation/internship shall be 50.

5. The candidate has to secure at least 36% marks to pass the examination and 25% marks in each individual paper. Even if he/she fails in one paper/course/practical, he/she will be declared fail. He/she however shall be allowed one more chance to appear in the examinations as ex-student. In such a case, the marks of practical's shall be carried forward for the said purpose and as per Maharaja Ganga Singh University rules and regulations.

Affiliation: The Programme shall be governed by the CESD, Yoga, Maharaja Ganga Singh University, Bikaner, Rajasthan

Post Graduate Diploma in Yoga and Naturopathy

Marking Scheme for External

Theory Papers	Duration	Max. Marks
PGDYN-1: Foundation of Yoga	**3 Hrs.**	**75**
PGDYN-2: Patanjali Yoga	**3 Hrs.**	**75**
PGDYN-3: Human Anatomy & Physiology	**3 Hrs.**	**75**
PGDYN-4: Yogic management for Diseases	**3Hrs.**	**75**
Combined Practical	**1 Day (6Hrs)**	**100**

Detailed Syllabus for Post Graduate Diploma in Yoga and Naturopathy (1 year)

PGDYN-1: Foundation of Yoga

Instructions to Paper Setters (Theory)

The paper is divided into three units. The question paper will consist of A, B and C sections. A part will consist of ten compulsory questions (at least three questions from each unit) (2 marks each). B part will consist of nine questions (three questions from each unit) and students are required to attempt five questions (5 marks each) selecting at least 1 question from each unit. C part will consist of six questions (2 questions from each unit of syllabus) and students are required to attempt three questions (10 marks each) selecting 1 question from each unit.

Unit- I

Historical and Mythological aspects leading to the origin of yoga, history and development of yoga, Definition of yoga in different yoga text and school of thought. Yoga in education, Stress& Yoga, Yoga and Personality, Yoga for emotion culture, science of happiness ,the basis of Yoga.

Unit- II

Yoga in Veda- Jnana, Bhakti, Karma, Dhyana yoga, Yama- Niyama and Pranasadhna.Yoga in Upanishad- Jnana, Bhakti, Karma, Astanga, Sharanga, Nada, Mantra, Dhyana .Nature and types of yoga in Adhyatma- Ramayan, Puranas, & Yoga Vasistha.

Unit- III

Yoga in shat darshana- General introduction, aim and objective of shat darshan with special reference to yoga. Yoga for unity in Diversity, Yoga – the individual and the society.Yoga inTantra- Introduction, Kundalini& shat- chakra-sadhana

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Reference books

1. Swami Atmananda- fouryogas, BharatiyavidyaBhavana. Bombay 1966
2. Swami Inanananda- Philosophy of yoga, Shri Ramakrishna Ashram, Mysore
3. Sing Lalan Prasad. Tntra, concept publishing Company, Delhi – 1976
4. Rajkumaripandey- Bhartiya yoga pramparakevividhaAyamaRadha Publication, Delhi-1993
5. Fenerstein George. The yoga Tradition: Its History, Literature, philosophy Bhavana Books and prints, Delhi 2002.

PGDYN-2: Patanjali Yoga

Instructions to Paper Setters (Theory)

The paper is divided into three units. The question paper will consist of A, B and C sections. A part will consist of ten compulsory questions (at least three questions from each unit) (2 marks each). B part will consist of nine questions (three questions from each unit) and students are required to attempt five questions (5 marks each) selecting at least 1 question from each unit. C part will consist of six questions (2 questions from each unit of syllabus) and students are required to attempt three questions (10 marks each) selecting 1 question from each unit.

Unit-I

Meaning of the word yoga, chapters, objective, and definition. ChittkibhumiKa, chittkiavasthayen, chittkivrathiyaen and its types,Chittvratinirodhkeupaaye.

Unit- II

Ishwarkiavdhaarna ,chittvikshapekekaaran,karmasidhant , Kriyayog,Panchakalesh-swaroop&Types,Sanyam,Vibootiyokaswaroop.

Unit III

Yam,
niyam,aasana,pranayamakaswaroopavamphalDharna.dhyaan,Samadhi,Samadhikebhed,bhandhan aurmoksh,kevalyekaswaroop,kevalyekebhed

Reference books

Muktikeupaya- Sami NorajanandBhihar
Yoga BhayasyVachaspati Mishra
PatanjalyogpradeepOmanandtisth
Yoga sutra VadhaspatiTika- Hariharnanda
Patanjali yoga sutra- Dr.KarmbetkarLonavala.
Yogvighyaanpradeepika-Dr.Vijey pal shashtri(Styampubilicitionhouse,newdelhi)

PGDYN-3: Human Anatomy & Physiology

Instructions to Paper Setters (Theory)

The paper is divided into three units. The question paper will consist of A, B and C sections. A part will consist of ten compulsory questions (at least three questions from each unit) (2 marks each). B part will consist of nine questions (three questions from each unit) and students are required to attempt five questions (5 marks each) selecting at least 1 question from each unit. C part will consist of six questions (2 questions from each unit of syllabus) and students are required to attempt three questions (10 marks each) selecting 1 question from each unit.

Unit-I

Muscular system - Types of muscles, Theory of contraction, categories of muscles, and properties of muscles. Skeletal system - Introduction of skeletal system, function of skeletal system.Types of joints, composition of bone, Types of bones, vertebral column of human body.Respiratory system- Definition of respiration, structure and function, mechanism of respiration, exchange of gases, oxygen transportation, and co-transportation of respiration. Nervous System – Definitions , Role of Nervous System , Structure of neuron , Type of neuron , Morphological and function , Conduction of nervous system (Brain & Spinal cord) Peripheral nervous system , Autonomic nervous system. Immune System - Definition, types of Immunity

Unit-II

Digestive system - definition of digestion, structure and function, mechanism of absorption of various product of digestive system control of digestion in various part of alimentary, hormonal control of digestive system.Circulatory system- structure and function of heart and blood vessels, cardiac cycle, regulation of cardiac output, blood pressure and factor affecting it, Hypertension. Blood & lymph-composition of blood, blood cells, function of blood, lymph, composition of lymph & functions

Unit-III .

Excretory System – Definition , Anatomy & Physiology of Kidneys , Structure and function of nephron , Mechanism of urine formation , Regulation of urine formation Sense organ – Structure & Functions (Eye , Skin, Ear, Nose and Tongue) Physiology of different sense organ Endocrine system – Endocrine gland – structure , function, secretion , regulation of hormonal secretion, mechanism of action of hormone , Emphasis on physiology of diabetes and stress hormones, physiological functions and abnormalities in secretion of pituitary , thyroid , parathyroid , hormones, adrenal and reproductive hormones. Disorders of endocrine glands .Reproductive system – Definition, Types of Reproductive, male reproductive system, Female reproductive system, menstrual cycle, Pregnancy changes during Pregnancy.

Reference books

1. A Glimpse of Human Body – Dr Shirley Telles.
2. Human Anatomy & physiology – Dr. Vrinda Singh

3. Guyton A.C (1985): Function of Human Body 4th Edition
4. Human Physiology – Chattergee C.C (1992)
5. Text book of Physiology – Jain A.K.

PGDYN-4:Yogic management for Diseases

Instructions to Paper Setters (Theory)

The paper is divided into three units. The question paper will consist of A, B and C sections. A part will consist of ten compulsory questions (at least three questions from each unit) (2 marks each). B part will consist of nine questions (three questions from each unit) and students are required to attempt five questions (5 marks each) selecting at least 1 question from each unit. C part will consist of six questions (2 questions from each unit of syllabus) and students are required to attempt three questions (10 marks each) selecting 1 question from each unit.

A Comprehensive study of the definition, classification, types, sigh, symptom and yoga therapy for diseases of the following system:

Unit- I

Respiratory system- Nasal Allergy and Asthma ,Cardiovascular system- Hypertension and coronary artery diseases, Psychiatry Anxiety, depressive neurosis, Insomnia, phobia, OCD (Obsessive

Unit-II

Digestive system- hyperacidity, Irritable bowel syndrome constipation, Gas (Flatulence).Musculo skeletal system - Arthritis, Back pain, ankylosing spondylitis

Unit III

Reproductive system- Infertility, Menstrual disorder, Role of stress in problems of Pregnancy, Menopause. Nervous system-Epilepsy, migraine, Endocrine System- Diabetes, obesity, Thyroid (Hypo & Hyper) .Special senses - eyes (Error of Refraction).

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Reference Books

1. Yoga for common ailments series published by svyp
2. Yoga therapy- by swami kuvalayanand, Lonavala
3. Yoga for different ailments Robinmonro, Nagarathna&Nagendra.
4. Light on pranayama B.K.S. Iyenger
5. Bandh& madras swami geetananda.
6. PPH- SVYP Bangalore

Practicals

1. Surya Namaskar
2. Kriyas (Shatkarma)
3. SukshmaVyayama

4. Asana. (Basic set)
5. Pranayama
1. Bandhas& Mudras
2. Omker Meditation
3. IRT+qrt + DRT
4. Chanting
5. Yoga game
6. Emotions culture through Music
7. Patriotic, Service- related songs
8. Karma Yoga Modules Presentation
    - Report Writing
    - Report Presentation
    - IAYT for common ailments.

- Personality AssessmentClinical project works/ Dissertation/project/training/review/ clinical project/internship/Case study & Parameters (Min. 8 to 10 Cases) (Only for PG Diploma students)
    - Presentation

Reference Books

1. Promotion of Positive health (Dr. H.R.Nagendra)
2. Pranayama (Kala &Vigyan) (Dr.H.R.Nagendra)
3. VyasPushpanjali (SVYP) (Dr. H.R.Nagendra)
4. SMET (SVYP, Dr. H.R.Nagendra) For the common ailments all the SVYP, Disease Books

M.G.S. UNIVERSITY,

BIKANER

SYLLABUS

SCHEME OF EXAMINATION AND COURSES OF STUDY

FACULTY OF ARTS

M.A. DRAWING & PAINTING

M.A. PREVIOUS EXAMINATION – 2021
M.A. FINAL EXAMINATION - 2022

SCHEME OF EXAMINATION

Each theory paper 3 Hrs. duration 100 Marks
Dissertation If any 100 Marks

1. The number of paper and the maximum marks for each paper practical shall be shown in the syllabus for the subject concerned. It will be necessary for a candidate to pass in the theory part as well as in the practical part (Whenever Prescribed) of a subject/Paper sepa rately.
2. A candidate for a pass at each of the Pervious and the Final Examination shall be required to obtain (i) at least 36% marks in the aggregate of all the paper prescribed for the examination and (ii) at least 36% marks in practical (s) whenever prescribed the examina tion, provided that if a candidate fails to at least 25% marks in each individual paper work. Wherever prescribed, he shall be deemed to have failed at the examination not with standing his having obtained the minimum percentage of marks required in the aggregate for the examination. No division will be awarded at the Pervious Examination; Division shall be awarded at the end of the Final Examination com bined marks obtained at the Pervious and the Final Examination taken together, as noted below:
   First Division 60% of the aggregate marks taken together
   Second Division 48% of the Pervious and the final Examination.
   All the rest shall be declared to have passed the examination.
3. If a candidate clears any paper (s) Practical(s)/Dissertation Prescribed at the Pervious and or/final Examination after a continuous period of three years, then for the purpose of working out his division the mini mum pass marks only viz 25% (36% in the case of practical) shall be taken into account in respect of such paper(s) Particle(S) Disserta tion are cleared after the expert of the aforesaid period of three year, provided that in case where a candidate require more than 25% marks in order to reach the minimum aggregate as many marks out of those actually secured by him will be taken into account as would enable him to make the deficiency in the requisite minimum aggregate.
4. The Thesis/Dissertation/Survey Report/Field Work shall be types & written and submitted in triplicate so as to reach the office of the Register at least 3 weeks before the commencement of the theory examinations. Only such candidates shall be permitted to offer dis sertation/Fields work/Survey Report/Thesis (if provided in the scheme of examination) in lieu of a paper as have secured at least 55% marks in the aggregate of all scheme and I and II semester examination taken in the case of semester scheme, irrespective of the number of paper in which a candidate actually appeared at the examination.

M.A DRAWING AND PAINTING
M.A. PREVIOUS

Time: 3 Hours
Theory Paper
Paper I Brief Studies of Eastern and Western Aesthetics 100 Marks
Paper II History of Indian Arts 100 Marks

Practical Paper (Any Two from the Following):
(a) Landscape Painting 80 Marks
(b) Portrait Painting 80 Marks
(C) Print Making 80 Marks
Submission of Work 40 Marks

M.A. Final

Theory Paper (Any two from the Following):

Paper III History & Philosophy of Modern Art 100 Marks
Paper IV Art in Education & Society 100 Marks
Paper V History of Western Art
100 Marks
Dissertation in lieu of Paper 100 Marks

Practical Paper (Any Two from the following):

(D) Study from life (Full figure) 80 Marks
(E) Graphic (Etching or Litho Serigraph) 80 Marks
(F) Composition 80 Marks
Submission of Work 40 Marks
Case Studies 100 marks

M.A. PREVIOUS
PAPER-I BRIEF STUDIES OF EASTERN AND WESTERN AESTHETICS

Time: 3 Hours **100 Marks**

UNITS I

1. Definition of Aesthetics for Eastern and Western Concept of Beauty. सौन्दर्य की पश्चिमी, और पूर्वीय धारणाऐं ।
2. Plato प्लेटो। Aristotle अरस्तु। Auguastine ऑगस्टाइन। Leonardo da vinci. लियोनादो द विनसी। Baumgarten बॉमगार्टन। Hegel हीगेल ।
3. Schelling षैलिंग। Kant कान्ट। Freud फ्रायड Tolsoty टाल्सटाय। Moorris Weitz मूरिज वेज।
4. Croce क्रोचे। G. Santayana जार्ज सेन्टाइना । S.K. Longer एस. के. लौगंर। I.A. Richards आई. ए. रिचर्डस। Roger Fry रोजर फ्राय।
5. Naty Shastra नाट्यषास्त्र। Ras Siddhant रस सिद्धान्त। Vatsyayana वात्स्यायन। Vishnu Dharmottram विश्णु धर्मोत्तरम्। Shaiva षैव । Buddha बुद्ध। Rabindra Nath Tagore रवीन्द्र नाथ टैगोर। A.K. Coomaraswamy आनन्द कुमार स्वामी।

Books Recommended :

1. History of Westerm Aesthetics- by K.G. Gillbert
2. History of Westerm Aesthetics- by K. C. Pandey
3. History of Oriental Aesthetics- by Dr. K.C. Pandey
4. History or Aesthetic by Katherine Gilbert.
5. A Modern Book of Aesthetes by Melvin Rader.
6. Aesthetic Adventure-by William Gaunt.
7. Christian and Oriental Philosophy or Art-By A.K. Coomaraswamy.
8. Transformation of Nature Art-by A.K. Coomaraswamy.
9. Western Aesthetics-by Dr. K.D. Pandey.
10. Estern Aesthetics-by Dr. K.D. Pandey.

PAPER-II-HISTORY OF INDIAN ART
UNITS

Time 3 Hrs. **100 Marks**

1. Indian Painting-Pre-Historic, Mohanjodaroh and Harapa, Jogimara.
2. Ajanta, Bagh, Sigirya, Pal and Jain School.
3. Rajasthani School, Pahari and Mughal.
4. Patna School, Raja Ravi verma, Renaissance, Amrita Shergill. Bengal School Rabindra Nath Tagore, Avnindra Nath Tagore, Yamini Roy, Nand Lal Bose
5. Bombay Group Bendre, K.K. Hebber, S. Chavda, Contemporay Artists, M.F. Husain, K.H. Ara, F.N Suja, Ramkumar, Ramgopal Vijayvargiya.

Books Recommended :

1. Indian Painting-by Percy Brown

2. Indian Painting-by M.S. Randhawa
3. The Art of India-by Stella Kramrisch
4. Indian Painting-by Galbraith
5. कला विकास : डॉ आर.ए. अग्रवाल
6. भारतीय चित्रकला का इतिहास : लेखक अविनाष बहादुर वर्मा
7. भारतीय चित्रकला : लेखक रायकृश्ण दास
8. भारतीय चित्रकला का इतिहास : प्रेमचन्द गोस्वामी
9. भारतीय चित्रकला एवं मूर्तिकला का इतिहास : रीता प्रताप

M.A. PREVIOUS

PRACTICAL PAPER A- LANDSCAPE PAINTING

80 Marks

Time 10 Hours two sessions 2½ hours in two consecutive Days, Landscape painting from sight in oil or water colour with proper handling of medium and Perspective Landscapes of Lanes. City scapes. Sky scapes and Hills capes should be painted. Study of bridges, Lake and light & shadows The Examiner should reach at the centre one hour before the beginning well. Whole the Exam. Should be conducted on the spot.
Size of the Paper : ½ Imperial
Medium - Oil Colour or water Colour

PAPER B- PORTRAIL PAINTING

80 Marks

Time 10 hours. Two Sessions of 2½ hours in two consecutive days. Two sittings every day with a break of 1 hour in between.
The examiner will send in instruction paper to the principal tope opened 24 hours before the fixed date for Examination, in which he or she will clearly explain about the model background etc. The Principal before Head of department of Drawing and Painting will open the instruction paper and handover him so that he or she can make arrangements for the same. Examiner should reach at the centre before the beginning of the of the exams.
size of the paper ½ imperial
Medium : Oil Colour or Water Colour

PAPER -C PRINT MAKING (LINO OR WOOD AND COLOGRAPH)

80 Marks

Size :Size of the graphic should not exceed. 10" × 8"/25×20cm
Time : 10 Hours Two sessions of 2½ hours in two consecutive days two sittings every day with a break of 1 hour in between. Examiner should reach at the centre before the beginning of the Examination. External Examiner and Internal Examiner will prepare the question paper. Which they put at best five topics from daily life.
Candidate will choose one topic form them and prepare a lay-Out on given drawing sheet in Black and white colour and submit to the Examiner in the first sitting and in the end the candidates will Submit their Preliminary Sketches and Block with the Final Prints.

Submission of Works : **40 Marks**

Every Candidate Will have to Submit the following work one month before the commencement of the Annual Examination.
(i) 10 Submission of each practical Paper offered executed either in oil colour or water colour.
Size : Near about ½ Imp. Or larger.
(ii) In Paper B Submission, the candidate will submit 3 cast study in pencil, 2 In Monochrome and 5 in two colours Portraits studied from living models.
(iii) A Sketch-book Containing not less than 50 (Sketches) Paper, Pencil or Colour,-Sketches of Human, animal Study of trees, Lanes, Huts, Rocks Hills & human faces. Size : ¼ Imperial.
Marks on the submission work will be awarded internally by the Head of the Department of Drawing and Painting. The Work of the candidate will be retained by him for one month after the declaration of result and then returned. to the Candidate.
Examination answer sheets (Paintings) will be retained in the department and will be preserved at least for twelve months after the declaration of result. These should not be returned to the candidates.

General Instructions :

(a) Candidate should Pass in Practical as well as in theory papers separately.

(b) Practical Examinations Should be arranged one Month before the commencement of theory Examination paper and three periods for sketching in a week.

(d) The practical Answer books shall be examined by one external and one internal examiner appointed on the recommended of the Head of the department as per exiting Practice.

M.A. FINAL

ANY TWO FROM THE FOLLOWING

Theory Paper III-History and Philosophy of Modern Art

UNITS

Time : 3 Hours **100 marks**

1. The turning point in the 19th century, Neo-classicism, Romanticism
2. Impressionism, Neo-Impressionism and Nabism.
3. Post Impressionist Painting, Fauvism, Cubism and Expressionism
4. Constructivism and Other Significant Post- Cubist Movement
5. Metaphysical Painting. Dada, Surrealism, Abstract art and significant Contemporary Movement.

Books Recomended :

1 Dictionary of 12lth century Art by Phaidon.
2. History of Impressionism-By John Rewalot.
3. Masters of Modern Art-by Alfred H.Bars.
4. Story of Modern Art by Sheldon Cheney
5. Modern Movements Art by R.H. Wilenski
6. Main Streams of Modern art-by John Canaday.
7. आधुनिक चित्रकला का इतिहास और दर्षन लेखक श्री र.वि. साखलकर
8. आधुनिक कला के प्रेणता, लेखक डॉ राजेन्द्र वाजपेयी

PAPER IV-ART IN EDUCATION AND SOCIETY

UNITS

Time 3 Hours **100 marks**

1. The Place of art In General Education. The Educational Value of Art Principles and aims of Teaching art and Art appreciation. What is good Art ?
2. planning art experiences, Visit to museums, Art Galleries Centers of art for painting and new concepts of art education. Organizing are exhibitions. Art and the Community. Art and International Understanding. The Place of art in society. Is art really so useless ?
3. The need and Methods of making society art-conscious social functions of art. How art has served man form the childhood of the human race. Art and Democracy. Democratic value of art.
4. Duties in the artists towards society. How art has helped in modern social life and thought ?
5. Importance of Art of Modern Industry. Art in the homes. Importance of art as a hobby. Art as an instrument for educating the mind.

Book Recommended :

1. Education art Art : Zeigfeld Edwin (UNESCO) 1953
2. Education Through Art : Herbet Read 3. Child Art : Viola
4. Creative and Mental growth : V. Lower elt. (Macmillian & Co.)
5. Sadial function Art: R.K.Mukherji
6. Art of Society : Herbern Read
7. Art in Industry : Herbern Read

PAPER V-STUDY OF WESTERN ART

UNITS

Time 3 Hours **100 marks**

1. Pre historic Painting, Art of Egypt, Art of Crete and mycenia,Greek

Art- Geometrical period to Hellenistic Period.

2. Etruscan and Roman Art, Early Christian Art, Byzantine Art Romanesque Art, Gothic Art.
3. Early Renaissance Period and High Renaissance Period.
4. Baroque Art, Classical Baroque Art of France, British Painting Baroque Art, Rococo Art
5 Neoclassicism, British landscape Painting, Romanticism, Realism, Pre-Raphaelism.

Book Recommended :

1. The Birth of Greek Art- Adre- malraux & Geroge Salles.
3. The Story of Art- Gombrich E.H.
4. The Rock pictures of Europe - Kuhn H.
5. A History of Western Art- Johnlay Sewell.
6. A History of Westen Art - Michaese levey.

Practical Papers

Practical (Any Two of the following) 80 Marks
Paper D Study form life (Full figure) 15 Hours

Duration: 15 Hours in 6 Sitting of 2½ hours each of 3 consecutive days. Two sitting every day with a break of 1 hour in between.
Size of Paper : Imperial size.
Medium : Oil Colour of water colour

Note : The External Examiner will send Practical question papers along with directions before commencement of Practical examination. The Internal examiner and the external Practical examiner will evaluate the practical work on the last day practical examination.

Paper E-GRAPHIC or Litho or Serigraph

80 Marks

Duration : 15 Hours 6 sittings of 2½ each on 3 consecutive days. Two sitting every day with a break of 1 hour in between.
Size of the graphic should not exceed 10"×8"/25×20cms
Candidate will submit their preliminary sketches and block along with the final prints.

Paper-F- Composition (Pictorial)

80 Marks

Duration : 15 Hours 6 Sitting of 2½ hours each consecutive days. Two sittings every day with a break of 1 hour in between. Medium : Oil Water colour or tempera.
The candidate will prepare a composition on a given subject primary sketch of the final composition will be done and submitted after sitting which will be attached to the final composition. Treatment many additional realistic or Modern. At least three figures should be arranged.

Note : The External Examiner will send Practical question papers along with directions before commencement of Practical examination. The Internal examiner and the external Practical examiner will evaluate the practical work on the last day practical examination.

Dissertation Work :

The Dissertation shall be submitted in triplicate to the Head of department at least three weeks before the commencement of the examination only such candidates shall be permitted to offer dissertation who have secured at least 55% Marks in the aggregate in M.A. Previous examination

Submission of Work: 40 Marks

Each Candidate will have to submit the following work one month before the commencement of the annual examination (Final)

(i) 10 Submission of each practical papers offered executed either in oil colour or water colour.

Size Near about full imperial of larger:

(ii) Five Original Compositions based on different modern trends on Imperial size paper or canvas.
(iii) A Sketch book Containing not Less than 50 Pencil or Colour Sketches group of human, Animals figures, huts lanes, Group trees and creative sketches .Size : ¼ Imperial :

Marks On the submission work will be awarded internal by the head of the department of Drawing & Painting. The work of the candidate will be retained by him for one Month after the declaration of the result and then returned to the candidate.

Case Studies : 100 Marks

The Subject of Case Studies work will allotted by the department on base of syllabus for post graduation course. The Students will study on detail through the year under the supervision of lecturer of the department. The student submit the detail analytical Case Studies report with photographs in three copies.

The report must be hand written and it should not be more then 100 pages. This report should be submit 15 days before to the commencement of the practical exam at the department

General Instructions:

(a) Candidate should Pass Practical as well as in theory Paper separately.

(b) Practical Examination should be arranged one month before the commencement of theory examinations. Examination answer sheets will be retained in the department and will be pre served at least for twelve months after the declaration of result. These should not be returned to the candidates.

(c) Three should be 12 Period for each Practical and 6 Period for each Theory Papers plus three period for sketching in a week.

(d) The Practical answer books shall be examined by one external and one internal examiner to be appointed on the recommendation of the Head of the department as per exiting Practice.

(e) The department should also arrange for an educational tour to ancient and modern art centers like ajanta. Elora Elephanta, Khajurao Mahablipuram ,National exhibitions, Modern art galleries, Art College and Places suitable for outdoor