

**M.Sc.(Computer Science) Lateral Entry
EXAMINATION 2020**

Session 2019-20

M.Sc.(Computer Science) Lateral Entry

EXAMINATION 2020

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 **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

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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)

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Paper Code: MCSLE -101

Paper Name : Mathematics for Computer Science

Scheme of Examination

Maximum Marks: 50

Duration: 3 Hours

Minimum Passing Marks: 13

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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's Outline Of Theory and Problems of Discrete Mathematics, 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

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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)

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4. Object-Oriented Software Engineering Using 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

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 Structure 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)

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

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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

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 Runnable Interface

Unit V

Applet: Applet Life Cycle, Applet Tag, Adding Applet to HTML File; Passing Parameters to Applets, Getting Input From User

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 applications , TMH, Sumitabha Das

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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 and Classes, 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, Ondblclick Events, JS Arrays, Working with Arrays, JS Objects, Window object, Document object, JS Functions, getElementById, innerHTML property, innerText 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)

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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

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:

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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.