MCA-101 **MCA–01/ PGDCA-01**

M.C.A. DEGREE EXAMINATION – DECEMBER, 2018.

First Year

COMPUTER FUNDAMENTALS

Time : 3 hours Maximum marks : 75

PART A — (5 × 5 = 25 marks)

Answer any FIVE questions.

1. Brief about generation of computers.

2. Describe the elements of sequential circuits.

3. List and explain various logic and shift operations.

4. With an example, explain the format of microinstruction.

5. Explain the uses of direct and indirect addressing modes.

6. Write about program development tools.

7. Compare RISC versus CISC.

PART B — (5 × 10 = 50 marks)

Answer any FIVE questions.

8. Discuss the various data representation in computer.

9. Explain the function of Secondary memory and I/O peripherals.

10. With a neat sketch, explain the function of ALU organization.

11. Give a note on Micro programmed control organization.

12. Discuss the components of micro computer with a neat sketch.

13. Explain the concept of pipeline vector processing.

14. Describe the operation of data flow architecture.

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MCA–102 **MCA–02**

M.C.A. DEGREE EXAMINATION – DECEMBER, 2018.

First Year

INTRODUCTION TO SOFTWARE

Time : 3 hours Maximum marks : 75

PART A — (5 × 5 = 25 marks)

Answer any FIVE questions.

1. Develop an algorithm to find the biggest number among the given three numbers.

2. Write note on deadlock avoidance.

3. Highlight the features of UNIX operating system.

4. What is Vi screen editor? Explain its uses.

5. Explain the importance of command interpreter in UNIX programming.

6. Outline the responsibilities of system administration.

7. Describe the role of software engineer in software organization.

PART B — ($5 \times 10 = 50$ marks)

Answer any FIVE questions.

8. Describe the functions of Linker and Loader.

9. Explain the various CPU scheduling algorithms.

10. Discuss the structure of UNIX operating system.

11. Explain the syntax of various text manipulation commands.

12. Explain the various operators and expression evaluation in shell programming.

13. Explain the phases of software life cycle with a neat sketch.

14. Write note on 4G1 and natural languages.

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MCA-103 **MCA–03/ PGDCA–02**

M.C.A. DEGREE EXAMINATION – DECEMBER, 2018.

First Year

DATA STRUCTURES THROUGH C

Time : 3 hours Maximum marks : 75

PART A — (5 × 5 = 25 marks)

Answer any FIVE questions.

1. What are the primitive data types in C?

2. List any four Input and Output functions in C.

3. Difference between structures and unions.

4. Explain call by value and call by reference.

5. Compare and contrast linked list and queue.

6. What are the two types of traversals in a graph?

7. Explain the types of file organizations in C.

PART B — (5 × 10 = 50 marks)

Answer any FIVE questions.

8. Write short notes on control structures in C.

9. Write about function definition and declaration.

10. Explain passing pointers and arrays to function with suitable examples.

11. Write short notes on text files and binary files.

12. Explain the queue operations.

13. Explain AVL trees and B-Tree.

14. Describe the sorting techniques.

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MCA–104 **MCA–04/ PGDCA–03**

M.C.A. DEGREE EXAMINATION – DECEMBER, 2018.

First Year

ELEMENTS OF SYSTEM ANALYSIS AND DESIGN

Time : 3 hours Maximum marks : 75

PART A — (5 × 5 = 25 marks)

Answer any FIVE questions.

1. Describe the characteristics of a system.

2. Write about data dictionaries.

3. What is modularization? Explain.

4. Explain the types of code.

5. Outline the need of documentation.

6. Describe the benefits of knowledge based system.

7. Explain the attributes of a good analyst.

PART B — (5 × 10 = 50 marks)

Answer any FIVE questions.

8. With a neat sketch, explain the function of system development life cycle.

9. Explain the types of feasibility.

10. Describe the design process of structured system design.

11. Discuss the procedure for data base design.

12. Explain benchmark testing and software selection criteria.

13. Discuss the techniques for building management information system.

14. Explain the components of multimedia.

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MCA–105 **MCA–05/ PGDCA–04**

M.C.A DEGREE EXAMINATION — DECEMBER 2018.

First Year

INTRODUCTION TO DATABASE MANAGEMENT SYSTEMS

Time : 3 hours Maximum marks : 75

PART A — (5 × 5 = 25 marks)

Answer any FIVE questions.

1. Describe the three views of data.
2. Explain the drawbacks of file management system.
3. Compare sequential and index sequential file organization.
4. Differentiate between RDBMS and DDBMS.
5. Describe the properties of normalization.
6. Highlight the pitfalls of RDBMS.
7. What are the objectives of Knowledge based management system?

PART B — (5 × 10 = 50 marks)

Answer any FIVE questions.

8. Explain the functions of Network model with an example.

9. Draw and E-R model for Library management system.

10. Discuss the multi key file organization.

11. Explain about evaluation of DBMS.

12. Elaborate on types of normal forms.

13. Describe the structure of distributed databases.

14. Write note on client/server computing.

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MCA–106 **MCA–06/ PGDCA–05**

M.C.A. DEGREE EXAMINATION – DECEMBER, 2018.

First Year

INTRODUCTION TO COMPUTER ORGANISATION

Time : 3 hours Maximum marks : 75

PART A — (5 × 5 = 25 marks)

Answer any FIVE questions.

1. Write short notes on binary fixed-point representation.

2. List any five digital logic gates with its truth table and graphic symbol.

3. Draw the block diagram of memory and associated registers and explain.

4. List out any five memory devices and explain briefly.

5. Draw the block diagram of four-bit full adder.

6. Explain the rules of the assembly language program.

7. Write short notes on program loops.

PART B — (5 × 10 = 50 marks)

Answer any FIVE questions.

8. Describe binary, octal and hexadecimal representation with suitable examples.

9. Describe the Read only memories.

10. Explain in detail about the DMA with block diagram.

11. What is mapping process? Explain the types of mapping.

12. Write in detail about micro instruction formats.

13. Describe in detail about the components of a CPU.

14. Discuss in detail about interrupts with necessary diagram.

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MCA–107 **MCA-07/ PGDCA–06**

M.C.A. DEGREE EXAMINATION — DECEMBER, 2018.

First Year

INTRODUCTION TO SOFTWARE ENGINEERING

Time : 3 hours Maximum marks : 75

PART A — (5 × 5 = 25 marks)

Answer any FIVE questions.

1. Define software engineering. List its tasks.

2. Brief about fourth generation techniques.

3. Describe the objectives of project planning.

4. Compare product and process.

5. Explain how to define task set for the software project.

6. Highlight the importance of formal technical Reviews.

7. Write note on modular design.

PART B — (5 × 10 = 50 marks)

Answer any FIVE questions.

8. With a neat sketch, explain the function of Rapid Application Development (RAD) process model.

9. Discuss the various project decomposition techniques.

10. Write about risk projection and risk mitigation.

11. Explain the ways of project scheduling and tracking.

12. Outline the activities involved in software configuration management.

13. Explain the concept of software prototyping and information flow.

14. Elaborate on test case design and art of debugging.

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MCA–108 **MCA–08**

M.C.A. DEGREE EXAMINATION – DECEMBER, 2018.

First Year

COMPUTER ORIENTED NUMERICAL METHODS

Time : 3 hours Maximum marks : 75

PART A — ($5 \times 5 = 25$ marks)

Answer any FIVE questions.

1. Write short notes on sources of error.

2. Write the algorithm for solving a given equation by using bisection method.

3. Solve the system of equations $2x + y = 3$ and $7x - 3y = 4$ by using Gauss elimination method.

4. Find the smallest positive root of the equation $2x^2 - 3x - 6 = 0$ by using Newton–Raphson method.

5. Find a second degree polynomial which best fit the data (1, 4), (2, 5) and (4, 13) by using Lagrange's interpolation Formula.

6. Fit a Straight line to the data given below by using the method of least squares.

x	0	1	2	3	4
y	1	0.8	3.3	4.5	6.3

7. Evaluate $\int_0^6 (1/(1+x))dx$ by using Simpson's 1/3rd rule (Use $h = 1$).

PART B — ($5 \times 10 = 50$ marks)

Answer any FIVE questions.

8. Find a root which lies between 1 and 2 of $x^3 + 2x^2 + 10x - 20 = 0$ by using Regula-falsi method.

9. Using Gauss Jordan method Solve the system of equations $10x + y + z = 12$; $2x + 10y + z = 13$ and $x + y + 5z = 7$.

10. Solve the system of equations $10x - 5y - 2z = 3$; $4x - 10y + 3z = -3$ and $x + 6y + 10z = -3$ by using Gauss Seidel iterative method.

11. Using Newton's divided difference formula find the polynomial to the given data

x	–1	0	1	3
$y = f(x)$	2	1	0	–1

12. From the following table of half - yearly premium for policies maturing at different ages estimate the premium for policies maturing at age x = 63 by using Newton's backward interpolation formula.

Age x	45	50	55	60	65
Premium	114.84	96.16	83.32	74.48	68.48

13. Evaluate the value of $\int_0^1 \left(1/(1+x^2)\right)dx$ by using Trapezoidal rule (Take h = 0.2).

14. Use Runge-Kutta method to find y at $x = 0.1$, given $dy/dx = y - x$, $y(0) = 2$.

MCA–109 **MCA–09/ PGDCA–07**

M.C.A. DEGREE EXAMINATION – DECEMBER, 2018.

First Year

C++ AND OBJECT ORIENTED PROGRAMMING

Time : 3 hours Maximum marks : 75

PART A — (5 × 5 = 25 marks)

Answer any FIVE questions.

1. What are the concepts of Object Oriented Programming?

2. Write any five reserved keywords in C++.

3. Write a note on storage classes and its types.

4. Write the operator precedence rules in C++.

5. Explain character array and multi-dimensional character array.

6. Define recursive function with an example. Brief how it works.

7. Explain UML and context diagrams.

PART B — (5 × 10 = 50 marks)

Answer any FIVE questions.

8. Explain type conversion and type casting with examples.

9. Describe with a diagram of Stream buffer class hierarchy.

10. Explain the following operators with example

    (a) Scope Resolution

    (b) Conditional

    (c) Member

    (d) New and delete.

11. Write short notes on looping control structures.

12. Write about array declaration, initialization and addressing.

13. Explain call by value parameters and call by reference parameters with suitable examples.

14. Explain about exception handling in C++.

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MCA–110 **MCA–10/ PGDCA–08**

M.C.A. DEGREE EXAMINATION – DECEMBER, 2018.

First Year

THEORY OF COMPUTER SCIENCE

Time : 3 hours Maximum marks : 75

PART A — (5 × 5 = 25 marks)

Answer any FIVE questions.

1. Let $U = \{1, 2, 3, ...10\}, A = \{1, 2, 3, 4, 5\}$ and $B = \{2, , 4, 6, 8\}$. Then find (a) $A \cup B$ (b) $A \cap B$ (c) $A - B$ (d) $B - A$ (e) A°

2. Let $f : R \to R$ defined by $f(x) = x^2$ and $g : R \to R$ defined by $g(x) = 2x + 3$. Find $f \circ g$ and $g \circ f$. Are they equal?

3. Construct the truth table for $\sim (p \wedge q) \leftrightarrow (\sim p \vee \sim q)$. Is it a tautology.

4. Establish that

$$(x)(P(x) \to Q(x)) \vee (x)(Q(x) \to R(x)) \Rightarrow (x)(P(x) \to R(x))$$

5. Find the language generated by the regular grammar $G = (N, T, P, S)$ where $N = \{S\}, T = \{a\}$, S, $\{S \to aS, S \to a\}$.

6. Find the language generated by the context free grammar $G = (N, T, P, S)$ where $N = \{S\}, T = \{a, b\}$, $S, \{S \to aSb, S \to ab\})$.

7. Define the terms (a) Regular Graph (b) Complete Graph (c) Degree of a vertex (d) path (e) Connected graph.

PART B — (5 × 10 = 50 marks)

Answer any FIVE questions.

8. Let Z be the set of all integers. Define a relation R on Z by aRb if and only if a-b is divisible by 3. Prove that R is an equivalence relation.

9. Let $f : R \to R$ defined by $f(x) = 5x + 3$. Check whether (a) f is 1-1 (b) f is onto. (c) Find f^{-1} if it exists.

10. Find the PDNF and PCNF of $(\sim P \to R) \wedge (Q \leftrightarrow P)$ by using truth table.

11. Prove that the conclusion $R \vee S$ follows logically from the premises
$C \vee D, (C \vee D) \to \sim H, \sim H \to (A \wedge \sim B)$ and
$(A \wedge \sim B) \to (R \vee S)$.

12. Define a Finite state automata. Explain in detail about its functioning.

13. Explain the process of constructing a Finite state automata by using a regular grammar.

14. Define a tree. Then prove that a tree with n vertices has n-1 edges.

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