

MCA-101

**MCA-01/
PGDCA-01**

**M.C.A. DEGREE EXAMINATION —
JUNE, 2018.**

First Year

COMPUTER FUNDAMENTALS

Time : 3 hours

Maximum marks : 75

PART A — (5 × 5 = 25 marks)

Answer any FIVE questions.

1. Explain in detail elements of combinational circuit.
2. Discuss about RAM with block diagram.
3. Explain basic structure of CPU.
4. Write short notes on Micro operation.
5. Discuss in CPU Registers with neat diagram.
6. Write characteristics of Multiprocessor.
7. Explain in detail of CISC.

PART B — (5 × 10 = 50 marks)

Answer any FIVE questions.

8. Explain about ALU in detail.
 9. Discuss components of Micro computers.
 10. Discuss about various Addressing mode.
 11. Describe RISC Architecture with neat diagram.
 12. Discuss about Multiplexers and Demultiplexers.
 13. Explain Architecture of Microprocessor with neat diagram.
 14. Briefly explain in Interprocessor communications (IPC).
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MCA-102

MCA-02

**M.C.A DEGREE EXAMINATION —
JUNE, 2018.**

First Year

INTRODUCTION TO SOFTWARE

Time : 3 hours

Maximum marks : 75

PART A — (5 × 5 = 25 marks)

Answer any FIVE questions.

1. What is process and what are the steps in process?
2. Explain in detail about Linkers.
3. Write short notes on Command interpreter.
4. Write the role of software engineering.
5. Write short notes on operator in shell programming.
6. Explain the features of UNIX file system.
7. Explain the Project planning tool.

PART B — (5 × 10 = 50 marks)

Answer any FIVE questions.

8. Discuss briefly in Deadlock.
 9. Discuss principles of software engineering.
 10. Write short notes on
 - (a) Algorithm
 - (b) Flow chart
 11. Explain about memory management.
 12. Explain file system and different types of files in UNIX operating system.
 13. Briefly explain Do, For Loops in UNIX with suitable example.
 14. Discuss in detail about trends in S/W development.
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MCA-103

**MCA-03/
PGDCA-02**

**M.C.A. DEGREE EXAMINATION —
JUNE, 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 is meant by library functions? List out its importance.
2. Explain the syntax and use of do-while loop with an example.
3. Write the procedure to insert an element in the middle of an array.
4. What are the various operations possible on stacks?
5. How will you check whether the queue is full or empty? Discuss.

6. What are the different file organizations?
7. Write an algorithm to determine the number of elements in a tree.

PART B — ($5 \times 10 = 50$ marks)

Answer any FIVE questions.

8. List out the logical operators and relational operators available in C and explain their use with suitable examples.
9. Discuss about the storage classes in C. Explain with suitable example.
10. Explain the differences between structure and union.
11. Write an algorithm to concatenate two singly linked lists.
12. Explain in detail about the graph traversal techniques with suitable example.
13. How an AVL tree differ from a binary search tree? How AVL trees are represented in computer memory?
14. Define sorting. Write an algorithm for merge sort explain with suitable example.

MCA-104

**MCA-04/
PGDCA-03**

**M.C.A. DEGREE EXAMINATION —
JUNE 2018.**

First Year

**ELEMENTS OF SYSTEM ANALYSIS AND
DESIGN**

Time : 3 hours

Maximum marks : 75

SECTION A — (5 × 5 = 25 marks)

Answer any FIVE questions.

1. Explain about characteristics of system.
2. Write shorts notes on output devices.
3. Write the procedure for hardware selection.
4. Explain different types of documentation.
5. What are preliminary investigation methods?
6. Write short notes on level of tests.
7. Discuss about Warnier / orr Diagrams.

SECTION B — (5 × 10 = 50 marks)

Answer any FIVE questions.

8. Briefly explain elements of a system.
 9. Explain direct access and sequential file organization.
 10. Discuss in details activity network for post implementation review.
 11. Discuss about the various criteria for software selection.
 12. Write details notes on DFD.
 13. Discuss about different level of quality assurance.
 14. Explain the different types of Feasibility study.
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MCA-105

**MCA-05/
PGDCA-04**

**M.C.A. DEGREE EXAMINATION —
JUNE 2018.**

First Year

**INTRODUCTION TO DATABASE
MANAGEMENT SYSTEM**

Time : 3 hours

Maximum marks : 75

PART A — (5 × 5 = 25 marks)

Answer any FIVE questions.

1. List out the advantages and disadvantages of network data model.
2. What are the differences between data and information?
3. Discuss about the evaluation of DBMS.
4. Explain the various normal forms with an example.
5. Discuss about the importance of Triggers in SQL
6. Explain the features of knowledge based system.
7. Describe about the object oriented system.

PART B — (5 × 10 = 50 marks)

Answer any FIVE questions.

8. Describe the main characteristics of the database approach in contrast with the file oriented approach.
9. Draw the E-R diagram for hospital database management system.
10. Explain the various file organizations for conventional DBMS.
11. What is functional dependency? Write an algorithm to find the minimal cover for a set of functional dependencies with suitable example.
12. Discuss in detail about the operators SELECT, PROJECT, UNION, CREATE and DELETE with suitable example.
13. Write in detail about the components of client/server computing.
14. Compare and contrast between RDBMS and OODBMS.

MCA-106

**MCA-06/
PGDCA-05**

**M.C.A. DEGREE EXAMINATION —
JUNE, 2018.**

First Year

**INTRODUCTION TO COMPUTER
ORGANISATION**

Time : 3 hours

Maximum marks : 75

PART A — (5 × 5 = 25 marks)

Answer any FIVE questions.

1. Convert the Decimal $(464.15)_{10}$ to binary number.
2. Explain about the Logic gates.
3. What is RAM? Explain It.
4. Briefly explain about I/O model.
5. Write short notes on ALU Organization.
6. Explain about the Microinstruction.
7. Write a brief note on Modular program.

PART B — (5 × 10 = 50 marks)

Answer any FIVE questions.

8. Describe about the Generation of computers.
 9. Discuss in detail about Sequential Circuits.
 10. Write a detailed note types of Auxiliary memory.
 11. Discuss in detail about I/O techniques.
 12. Discuss briefly about the instruction format.
 13. Explain in detail about Control unit organization.
 14. Explain in detail about the Assembly language program development tools.
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MCA-107

**MCA-07/
PGDCA-06**

**M.C.A. DEGREE EXAMINATION –
JUNE, 2018.**

First Year

INTRODUCTION TO SOFTWARE ENGINEERING

Time : 3 hours

Maximum marks : 75

PART A — (5 × 5 = 25 marks)

Answer any FIVE questions.

1. List and explain the characteristics of software.
2. Describe the advantages and disadvantages of linear sequential model.
3. Discuss the role of system analyst in project development team.
4. Write about software project standards.
5. What do you mean by software reviews? Explain.
6. Discuss the benefits of behavioral modeling.
7. What are the principles of software testing?

PART B — (5 × 10 = 50 marks)

Answer any FIVE questions.

8. Discuss the phases of software development.
9. With a neat sketch, explain the working of Spiral model.
10. Describe the use of project estimation models.
11. Narrate the activities involved in risk management.
12. Explain the activities of software quality assurance.
13. Write about ISO 9000 quality standards.
14. Explain about unit testing and integration testing.

MCA-108

MCA-08

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

First Year

COMPUTER ORIENTED NUMERICAL
METHODS

Time : 3 hours

Maximum marks : 75

PART A — (5 × 5 = 25 marks)

Answer any FIVE questions.

1. Briefly explain the pitfalls in Computation.
2. Explain about the Floating representation of numbers with suitable example.
3. Solve the system of equations $5x + 4y = 15$ and $3x + 7y = 12$ by using Gauss Jordan method.
4. Find the smallest positive root of the equation $3x - \cos x - 1 = 0$ by using Newton-Raphson method.

5. Using Lagrange's interpolation formula find a second degree polynomial which passes through the points (0, 0), (1, 1) and (2, 20).
6. By the method of least squares find the best fitting Straight line to the data given below :
- | | | | | | |
|-------|----|----|----|----|----|
| x : | 5 | 10 | 15 | 20 | 25 |
| y : | 15 | 19 | 23 | 26 | 30 |
7. Using Trapezoidal rule evaluate $\int_{0.6}^2 y dx$ from the following table :
- | | | | | | | | | |
|-------|------|------|------|------|------|------|-------|-------|
| x : | 0.6 | 0.8 | 1.0 | 1.2 | 1.4 | 1.6 | 1.8 | 2.0 |
| y : | 1.23 | 1.58 | 2.03 | 4.32 | 6.25 | 8.36 | 10.23 | 12.45 |

PART B — (5 × 10 = 50 marks)

Answer any FIVE questions.

8. Find the smallest positive root of the equation $x^3 - 2x - 5 = 0$ by regula-faisi method.
9. Solve the system of equations $x - y + z = 1$, $-3x + 2y - 3z = -6$ and $2x - 5y + 4z = 5$ by using Gauss Elimination method.
10. Solve the system of equations $8x - y + z = 18$, $2x + 5y - 2z = 3$ and $x + y - 3z = -6$ by using Gauss Seidel iterative method.

11. Find the cubic function from the following data by using Newton's divided difference formula.

$$\begin{array}{rcccc} x: & 0 & 1 & 3 & 4 \\ y = f(x): & 1 & 4 & 40 & 85 \end{array}$$

12. From the following data find y at $x = 43$ by using Newton's forward interpolation formula.

$$\begin{array}{rcccccc} x: & 40 & 50 & 60 & 70 & 80 & 90 \\ y = f(x): & 184 & 204 & 226 & 250 & 276 & 304 \end{array}$$

13. Compute the value of $\int_4^{5.2} \log_e x \, dx$ by using Simpson's 1/3 rule (Take $h = 0.2$).

14. Solve $dy/dx = -y$, $y(0) = 1$ to find $y(0.01)$ by using Euler's method.
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MCA-109

**MCA-09/
PGDCA-07**

**M.C.A. DEGREE EXAMINATION —
JUNE, 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. Difference between structured programming and Object Oriented Programming.
2. Write a note about compiling and running a C++ program.
3. Enumerate the types of loops in C++.
4. Write the operator precedence rules in C++.
5. What are the difference between structures and unions?

6. Explain about passing a function to another function.
7. How command line arguments are used in the main() function?

PART B — (5 × 10 = 50 marks)

Answer any FIVE questions.

8. Explain the storage classes in C++.
9. Describe type conversion and types casing with examples.
10. Write short notes on conditional control structures.
11. Explain (a) Nesting loops (b) Infinite loops (c) break and continue statements.
12. Differentiate structures from unions. What is Anonymous union?
13. What are the visibility labels in C++?
14. Explain run-time polymorphism and compile time polymorphism.

MCA-110

**MCA-10/
PGDCA-08**

**M.C.A. DEGREE/P.G.D.C.A.
EXAMINATION — JUNE, 2018.**

First Year

THEORY OF COMPUTER SCIENCE

Time : 3 hours

Maximum marks : 75

SECTION A — (5 × 5 = 25 marks)

Answer any FIVE questions.

1. Show that

$((P \vee Q) \wedge \neg(\neg P \wedge (\neg Q \vee \neg R))) \vee (\neg P \wedge \neg Q) \vee (\neg P \wedge \neg R)$
is a tautology.

2. Explain any two matrix representation of a graph.
3. Construct an automaton M with will accept the language $L = \{b^m ab^n : m \text{ and } n \text{ positive}\}$.
4. Prove that the class of regular sets is closed under homomorphisms and inverse homomorphisms.
5. Define adjacency matrix of the graph G explain with an example.

6. State and prove Lagrange's theorem.
7. Compare recursive and recursively enumerable languages.

SECTION B — (5 × 10 = 50 marks)

Answer any FIVE questions.

8. State and prove pumping lemma for context free languages.
9. Design mealy machine to find out 2's complement of a binary number.
10. Design the DFA to accept all the binary strings over $\Sigma = \{0,1\}$ that are beginning with 1 and having its decimal value multiple of 5.
11. Prove that U , the universal language is recursively enumerable but not recursive.
12. Let $G = (V, T, P, S)$ be a context-free grammar. Then prove that $S \Rightarrow a$ if there is a derivation tree in grammar G with yield x .

13. Prove that if L is accepted by an NFA with ϵ -transitions, then L is accepted by NFA without ϵ -transitions.
 14. Prove that if L is $L(M_2)$ for some PDA M_2 , then L is $N(M_1)$ for some PDA, M_1 .
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