MCA-201 **MCA–01/ PGDCA-01**

M.C.A. DEGREE EXAMINATION – JUNE 2019.

First Year

COMPUTER FUNDAMENTALS

Time : 3 hours Maximum marks : 75

PART A — (5 × 5 = 25 marks)

Answer any FIVE questions.

1. Compare fixed point and floating point number representation.

2. Construct the truth table for three input NAND and NOR gates.

3. List and explain the various arithmetic and register transfer operations.

4. Describe the functions of control unit.

5. Enumerate the characteristics of instruction set.

6. Write about interconnection structures.

7. Highlight the objectives of RISC and CISC Machines.

PART B — (5 × 10 = 50 marks)

Answer any FIVE questions.

8. Elaborate on generations of computers.

9. Discuss the concept of I/O organization.

10. With a neat sketch, explain the structure of CPU.

11. Explain the function of micro programmed control unit.

12. Describe the various addressing modes with examples.

13. Explain about inter process communication.

14. Explain the architecture of any one RISC machine with a neat block diagram.

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MCA – 202 **MCA – 02**

M.C.A. DEGREE EXAMINATION – JUNE 2019.

First Year

INTRODUCTION TO SOFTWARE

Time : 3 hours Maximum marks : 75

PART A — (5 × 5 = 25 marks)

Answer any FIVE questions.

1. Draw a flow chart to perform the matrix addition.

2. Compare multiprogramming versus multitasking

3. Bring out the features of text editor.

4. Brief about file permissions in Unix environment.

5. Explain the parameter passing with an example.

6. Describe the concept of file mounting and unmounting.

7. What are the principles of software engineering

PART B — (5 × 10 = 50 marks)

Answer any FIVE questions.

8. Compare machine, assembly and procedural languages.

9. Write note on I/O device management.

10. Explain the different types of files in Unix.

11. Write a detailed note on Vi screen editor.

12. Explain the various shell programming language constructs.

13. Explain the use of C programming code in shell programming with an example

14. Write note on case tools.

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MCA – 203 **MCA – 03/ PGDCA–02**

M.C.A. DEGREE EXAMINATION – JUNE 2019.

First Year

DATA STRUCTURES THROUGH "C"

Time : 3 hours Maximum marks : 75

PART A — (5 × 5 = 25 marks)

Answer any FIVE questions.

1. Explain constants and variables in C.

2. Write short notes on main() function.

3. What is an array? Distinguish between single and multi-dimensional array?

4. Write a note on storage classes and its types?

5. Compare and contrast stack and queue.

6. Explain singly, two-way and circular linked list.

7. Explain the types of file organizations in C.

PART B — (5 × 10 = 50 marks)

Answer any FIVE questions.

8. Enumerate the types of operators in C with an example for each.

9. Write about the Control Structures in C.

10. Explain call by value and call by reference with suitable examples.

11. Write in detail about random access in files in C.

12. Explain the stack operations.

13. What are the types of graph traversals? Explain with examples.

14. Write about the searching techniques.

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MCA-204 **MCA04/ PGDCA-03**

M.C.A. DEGREE EXAMINATION – JUNE 2019.

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 elements of system analysis.

2. What is Data Flow Diagram (DFD)? Explain the notations used in DFD.

3. Explain the concept of system specifications.

4. Briefly describe the types of file.

5. Explain the activities involved in quality assurance.

6. What is review plan? Explain.

7. Narrate the human problems in automated office.

PART B — (5 × 10 = 50 marks)

Answer any FIVE questions.

8. Discuss the stages involved in project selection.

9. Write about cost benefit analysis and Decision tree.

10. Give an example to illustrate the process of form design.

11. Explain the concept of input design and control.

12. Discuss the types of documentation.

13. Give an overview of computing, communication and database technologies.

14. Explain the concept of evaluation and selection of a system.

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MCA-205 **MCA 05/ PGDCA-04**

M.C.A. DEGREE EXAMINATION – JUNE 2019.

First Year

INTRODUCTION TO DATABASE MANAGEMENT SYSTEM

Time : 3 hours Maximum marks : 75

SECTION A — (5 × 5 = 25 marks)

Answer any FIVE questions.

1. List out the advantages and disadvantages of database management system.

2. Describe the notations used in E-R model.

3. Write about administration of DBMS.

4. Explain the properties of relational algebra.

5. What is functional dependency? Explain.

6. Compare RDBMS and OODBMS.

7. Describe the objectives of client/server database.

SECTION B — (5 × 10 = 50 marks)

Answer any FIVE questions.

8. Explain the three level architecture of DBMS with a neat sketch.

9. Tabulate the comparison of E-R, network, Relational and Hierarchical database models.

10. Discuss the function of sequential file organization.

11. Explain the various types of SQL commands with their syntax.

12. Discuss the design of distributed databases.

13. Write note on object oriented databases.

14. Explain the architecture of client/server database.

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MCA-206 **MCA06/ PGDCA-05**

M.C.A. DEGREE EXAMINATION
JUNE 2019.

First Year

INTRODUCTION TO COMPUTER ORGANISATION

Time : 3 hours Maximum marks : 75

PART A — (5 × 5 = 25 marks)

Answer any FIVE questions.

1. Write a brief notes on various generation of Computers.

2. Write short notes on Error correction and detection codes.

3. Draw the block diagram of memory unit and explain.

4. Briefly explain memory interleaving.

5. Compare RISC and CISC processors.

6. Draw the block diagram of microcomputer system and briefly explain its components.

7. Write short notes on program loops.

PART B — (5 × 10 = 50 marks)

Answer any FIVE Questions

8. Explain the architecture of a basic computer.

9. Explain in detail about the DMA with block diagram

10. Write in detail about any four addressing modes

11. Describe the various basic instruction formats.

12. Write in detail about micro programmed control

13. Write short notes on I/O devices.

14. Discuss in detail about interrupts with necessary diagram.

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MCA-207 **MCA-07/ PGDCA-06**

M.C.A. DEGREE EXAMINATION – JUNE 2019.

First Year

INTRODUCTION TO SOFTWARE ENGINEERING

Time : 3 hours Maximum marks : 75

PART A — (5 × 5 = 25 marks)

Answer any FIVE questions.

1. Discuss the various phases of software development.

2. Write short notes on linear sequential model.

3. Describe the roles of system analyst.

4. Write in detail about project development team structures.

5. Describe in detail about software reviews.

6. Explain in detail about software configuration management.

7. Write short notes on behavioural modeling.

PART B — (5 × 10 = 50 marks)

Answer any FIVE questions.

8. Explain in detail about Spiral model with neat sketch.

9. With neat diagram, explain about incremental software process model.

10. Write in detail about risk identification and management.

11. Describe in about project planning and control.

12. Explain in detail about software quality assurance and its activities.

13. Elaborate on software analysis and software prototyping.

14. Briefly discuss about various testing strategies.

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MCA–208 **MCA–08**

M.C.A. DEGREE EXAMINATION – JUNE, 2019.

First Year

COMPUTER ORIENTED NUMERICAL METHODS

Time : 3 hours Maximum marks : 75

PART A — ($5 \times 5 = 25$ marks)

Answer any FIVE questions.

1. Explain about the pitfalls in computation.

2. Solve the equation $x^3 + x - 1 = 0$ by using Newton-Raphson method.

3. Compare direct and indirect methods of solving linear algebraic equations.

4. Using Lagrange's interpolation formula find $f(4)$ given that

x	0	2	3	6
$f(x)$	659	705	729	804

5. Using Newton forward interpolation formula find $f(1)$ given that

x	0	2	4	6
$f(x)$	–3	5	21	45

6. Evaluate $\int dx/(1+x)$ between the limits 0 and 1 by using Simpson's 1/3rd rule by taking $h = 1$.

7. Using Euler's method solve numerically the equation $y^1 = x + y, y(0) = 1$ for y(0.2) and y(0.4) by taking $h = 0.2$.

PART B — ($5 \times 10 = 50$ marks)

Answer any FIVE questions.

8. Find the smallest positive root of the equation $x^3 - 9x + 1 = 0$ by using bisection method.

9. Solve for a positive root of $x - \cos x = 0$ by using Regula falsi method.

10. Solve the system of equations $10x + y + z = 12$; $2x + 10y = 13; x + y + 5z = 7$ by using Gauss elimination method.

11. Solve the system of equations $8x - 3y + 2z = 20$; $4x + 11y - z = 33$; $6x + 3y + 12z = 35$ by using gauss Jacobi method correct to 2 decimal places.

12. Fit a best fitting straight line to the following data by using the method of least squares.

x	5	10	15	20	25
$f = f(x)$	15	19	23	26	30

13. Find the first derivative of the function tabulated below at the point x 1.5 by using Newton's forward interpolation formula;

x	1.5	2.0	2.5	3.0	3.5	4.0
$y = f(x)$	3.375	7.0	13.625	24.0	38.875	59.0

14. By applying Runge-Kutta method of fourth order find $y(0.1)$ from $y^1 = y - x$, $y(0) = 2$ by taking $h = 0.1$.

MCA–209 **MCA–09 / PGDCA–07**

M.C.A. DEGREE EXAMINATION — JUNE, 2019.

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 tokens and explain its types.

2. Explain stream buffer class hierarchy.

3. What is scope resolution operator? Give an example.

4. Explain how nesting of loops is done with an example.

5. What are the difference between structures and unions?

6. How will you pass a function to another function?

7. Explain UML and Context diagram.

PART B — (5 × 10 = 50 marks)

Answer any FIVE questions.

8. Explain about

   (a) keywords

   (b) identifiers and rules

   (c) constants.

9. Describe type conversion and type casting with examples.

10. Write short notes on

    (a) arithmetic operator

    (b) relational operator

    (c) logical operator

    (d) bitwise operator

11. Explain any four control structures present in C++?

12. Describe multi-dimensional array with

    (a) declaration

    (b) initialization

    (c) addressing

13. How exceptions are handled in C++?

14. Explain function and operator overloading

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MCA – 210 **MCA –10/ PGDCA–08**

M.C.A. DEGREE EXAMINATION — JUNE 2019.

First Year

THEORY OF COMPUTER SCIENCE

Time : 3 hours Maximum marks : 75

PART A — ($5 \times 5 = 25$ marks)

Answer any FIVE questions.

1. Give an example of a functions as a set of ordered pairs which is

   (a) One-one but not onto

   (b) Both one–one and onto.

2. Define any three operations on sets with one example for each.

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

4. Establish that
   $(\exists x)\ (P(x) \wedge Q(x)) \Rightarrow (\exists x)P(x) \wedge (\exists xQ(x))$.

5. Design a Finite State automata that precisely accepts those strings over {0, 1} that contains even number of zeros.

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

7. Define the terms

   (a) Walk

   (b) Parallel edges

   (c) Degree of a vertex

   (d) Circuit

   (e) Isolated Vertex.

PART B — (5 × 10 = 50 marks)

Answer any FIVE questions.

8. Let $A = \{1, 2, 3, 4\}$ and let R be a relation defined on A by $R = \{(1, 1), (1, 2), (2, 1), (2, 2), (2, 3), (3, 2), (3, 3), (4, 4)\}$. Check whether R is an equivalence relation or not.

9. Let $f : R \to R$ defined by $f(x) = 2x$. Check whether

   (a) f is 1–1

   (b) f is onto

   (c) Find f^{-1} if it exists.

10. Prove that the conclusion $R \wedge (P \vee Q)$ follows from the premises $P \vee Q$, $Q \to R$, $P \to M$, and $\sim M$.

11. Construct the truth table of $(P \to (Q \wedge R)) \wedge (P \to (\sim Q \wedge \sim R))$. Then write is PDNF and PCNF.

12. Define a Turing machine and explain the techniques of construction of Turing machine.

13. Given the requlal grammar $G = (N, T, P, S)$ where $N = \{S\}, T = \{a\}, S, \{S \to aS, S \to a\}$. Design a Finite automata which accepts the language L(G).

14. Prove that in an undirected graph the sum of the degrees of all the vertices is always even. Hence prove that the in an undirected graph the number of vertices of odd degree is always even.