PG–807 **MCA–01/ PGDCA-01**

M.C.A. DEGREE/PGDCA EXAMINATION – DECEMBER, 2019.

First Year

COMPUTER FUNDAMENTALS

Time : 3 hours Maximum marks : 75

PART A — (5 × 5 = 25 marks)

Answer any FIVE questions.

1. Describe in detail about number systems.

2. Write short notes on I/O processes.

3. Explain in detail about execution of micro-operation.

4. Describe in detail about ALU organization.

5. Describe the Motorola 68000 microprocessor.

6. Illustrate the concept of interfacing assembly program to HLL program..

7. Write about inter-processor communication.

PART B — (5 × 10 = 50 marks)

Answer any FIVE questions.

8. Illustrate in detail about sequential circuits and interconnection structures.

9. Explain in detail about I/O peripherals and techniques.

10. Describe in detail about micro programmed control unit.

11. Elaborate on basic and advanced structure of CPU.

12. Explain the various types of addressing modes.

13. Write notes on RISC objectives and CISC objectives.

14. Explain RISC architecture and provide comparison of various RISC architectures.

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PG-808 **MCA–02**

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

First Year

INTRODUCTION TO SOFTWARE

Time : 3 hours Maximum marks : 75

PART A — (5 × 5 = 25 marks)

Answer any FIVE questions.

1. Provide the various symbols used in flow chart and with their purposes.

2. Describe in detail about I/O device management.

3. List the various features of UNIX operating system.

4. Write short notes on Line editors.

5. Explain in detail about command interpreter.

6. Describe how to add user accounts.

7. Describe the role of software engineer.

PART B — (5 × 10 = 50 marks)

Answer any FIVE questions.

8. Illustrate in detail about memory management and file management.

9. Describe in detail about CPU scheduling.

10. Write short notes on file permissions and user privileges.

11. Explain the structure of UNIX operating system.

12. Elucidate the shell programming language constructs and its operators.

13. Explain in detail about software life cycle.

14. Describe in detail about the qualities of a software product.

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PG-809 **MCA-03/ PGDCA-2**

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

First Year

DATA STRUCTURES THROUGH C

Time : 3 hours Maximum marks : 75

PART A — (5 × 5 = 25 marks)

Answer any FIVE questions.

1. Briefly explain the primitive data types available in C.

2. Explain if and switch control structures.

3. Describe call by value with an example.

4. How will you define stack and queue structure? Explain.

5. Explain depth-first search with an example.

6. What is binary tree? How will you represent it in memory?

7. Explain any two sorting techniques.

PART B — (5 × 10 = 50 marks)

Answer any FIVE questions.

8. Explain various operators present in C.

9. Compare and contrast structure and union.

10. Discuss about text and binary files.

11. Write about queue operations.

12. How will you add and delete an element in doubly linked list. Give pseudocode.

13. Discuss AVL and B-tree with an example for each.

14. What is file organization? Explain its types.

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PG-810 **MCA-04/ PGDCA-03**

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

First Year

ELEMENTS OF SYSTEMS ANALYSIS AND DESIGN

Time : 3 hours Maximum marks : 75

PART A — (5 × 5 = 25 marks)

Answer any FIVE questions.

1. Write short notes on decision tables and decision trees.

2. Describe about preliminary investigation of a problem.

3. Explain about structured design of a system.

4. Write short notes on form design.

5. Illustrate in detail about knowledge based system.

6. Describe in detail about quality assurance.

7. Describe the components of multimedia.

PART B — (5 × 10 = 50 marks)

Answer any FIVE questions.

8. Write in detail about problem classification and definition.

9. Explain in detail about cost benefit analysis and fact finding techniques.

10. Illustrate in detail about output system design.

11. Write in detail about file organisation and design.

12. Explain in detail about communication and database technologies.

13. Explain the different levels of test and testing plan.

14. Describe the hardware and software requirements for multimedia system.

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PG-811 **MCA-05/ PGDCA-04**

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

First Year

INTRODUCTION TO DATABASE MANAGEMENT SYSTEM

Time : 3 hours Maximum marks : 75

PART A — (5 × 5 = 25 marks)

Answer any FIVE questions.

1. Write in detail about three views of data.

2. Compare file system and database management system.

3. Describe the concept of file organization.

4. Discuss about administration of DBMS.

5. Illustrate the structure of distributed database.

6. Write short notes on object oriented DBMS.

7. Compare and contrast between KBMS and DBMS.

PART B — (5 × 10 = 50 marks)

Answer any FIVE questions.

8. Draw the architecture of DBMS and explain it in detail.

9. Briefly explain about E-R model and relational database model.

10. Describe in detail about the methods of file organization.

11. Discuss in detail about normalization techniques.

12. List the various data manipulation statements with syntax and purposes.

13. Write in detail about client/server database management system.

14. Describe in detail about knowledge base management system.

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PG–812 **MCA–06/ PGDCA–5**

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

First Year

INTRODUCTION TO COMPUTER ORGANISATION

Time : 3 hours Maximum marks : 75

PART A — (5 × 5 = 25 marks)

Answer any FIVE questions.

1. Briefly explain about evolution of computers.

2. Discuss about interconnection techniques.

3. Explain about random access memory.

4. Write about structure of CPU with a diagram.

5. Draw the block diagram of two-bit full adder and sub tractor.

6. Briefly explain Motorola 68000 microprocessor.

7. What is interrupt and its need?

PART B — (5 × 10 = 50 marks)

Answer any FIVE questions.

8. Describe error-detection and error-correction codes.

9. Explain ROM and its types.

10. Discuss about I/O model and its techniques.

11. Describe various instruction formats.

12. Write in detail about micro programmed control.

13. Discuss about microcomputer architecture with suitable diagram.

14. Explain COM programs and EXE programs.

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PG-813 **MCA-07/ PGDCA-06**

M.C.A. DEGREE / PGDCA EXAMINATION – DECEMBER 2019.

First Year

INTRODUCTION TO SOFTWARE ENGINEERING

Time : 3 hours Maximum marks : 75

PART A — (5 × 5 = 25 marks)

Answer any FIVE questions.

1. Describe the components and characteristics of software.

2. Write short notes on incremental software process model.

3. Discuss in detail about planning objectives.

4. Write short notes on risk management.

5. Write in detail about formal technical reviews.

6. Discuss in detail about art of debugging.

7. Write short notes on test case design.

PART B — (5 × 10 = 50 marks)

Answer any FIVE questions.

8. Briefly describe about the various phases of software development.

9. Explain in detail about spiral model with neat diagram.

10. Write in detail about decomposition techniques and project estimation models.

11. Discuss in detail about ISO 9000 quality standards.

12. Illustrate in detail about project scheduling and tracking.

13. Discuss in detail about software analysis concepts and principles.

14. Explain in detail about black box testing and white box testing.

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PG – 814 **MCA–08**

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

First Year

COMPUTER ORIENTED NUMERICAL METHODS

Time : 3 hours Maximum marks : 75

PART A — (5 × 5 = 25 marks)

Answer any FIVE questions.

1. Explain how floating point numbers are represented in Computers.

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

3. Briefly explain how do you solve a system of linear equations by using Cramer's rule.

4. Apply Lagrange's interpolation formula to find $f(2)$ from the data given below

x	0	1	4	5
$f(x)$	4	3	24	39

5. Using Newton backward interpolation formula find f(5.5) given that

x	3	4	5	6
$f(x)$	6	24	60	120

6. Evaluate $\int \log_e x\,dx$ between the limits 4 and 5.2 by using Simpson's 1/3rd rule by taking $h = 0.2$.

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 × 10 = 50 marks)

Answer any FIVE questions.

8. Solve the equation $x^3 + x^2 - 1 = 0$ for the positive root correct to 2 decimal places by using fixed point iteration method.

9. Find the real root of $3x - \cos x - 1 = 0$ by using Newton-Raphson method.

10. Solve the system of equations $3x + y - z = 3$;

$2x - 8y + z = -5$; $x - 2y + 9z = 8$ by using Gauss elimination method.

11. Solve the system of equations $4x + 2y + z = 14$; $x + 5y - z = 10$; $x + y + 8z = 20$ by using Gauss Seidel iterative method correct to 2 decimal places.

12. Find the age corresponding to the annuity value 13.6 from the given table by using Lagrange's inverse interpolation formula.

Age (x)	30	35	40	45	50
Annuity value (y)	15.9	14.9	14.1	13.3	12.5

13. Find the first derivative of the function tabulated below at $x = 50$ and at $x = 56$ by using Newton's forward interpolation formula and Newton's backward interpolation formula respectively.

x	50	51	52	53
$y = f(x)$	3.6840	3.7084	3.7325	3.7563
x	54	55	56	
$y = f(x)$	3.7798	3.8030	3.8259	

14. Apply fourth order Runge-Kutta method to find $y(0.1)$ given that $y^1 = x + y, \quad y(0) = 1$ by taking $h = 0.1$.

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PG–815 **MCA–09/ PGDCA–7**

M.C.A. DEGREE EXAMINATION — DECEMBER, 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 the concepts present in Object Oriented Programming?
2. How precedence is assigned to operators in C++?
3. Explain break and continue statements with an example.
4. Define multi-dimensional array with an example.
5. What are visibility labels and its types?
6. Define virtual functions. Give any two rules.
7. Write about compiling and running a C++ file.

PART B — (5 × 10 = 50 marks)

Answer any FIVE questions.

8. Explain data types present in C++. Give its hierarchy.

9. What are storage classes available in C++?

10. Explain the following operators

    (a) Scope Resolution

    (b) Conditional

    (c) Value

    (d) Member.

11. How will you compare increment and decrement operation of while and do-while loop? Give example for each.

12. Differentiate structures from union. What is anonymous union?

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

14. Write about run-time polymorphism and compile-time polymorphism.

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PG – 816 **MCA–10/ PGDCA–8**

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

First Year

THEORY OF COMPUTER SCIENCE

Time : 3 hours Maximum marks : 75

PART A — (5 × 5 = 25 marks)

Answer any FIVE questions.

1. Consider a relation R on the set containing A = { 1, 2, 3, 4, 5 6 } defined by R = $\{(a,b)/|a-b|=2\}$.

   (a) List the elements of R

   (b) List the elements of R^{-1}

   (c) Draw the graph of R

   (d) Write the matrix of R

   (e) List the elements of R ° S.

2. Let $f : R \to R$ defined by $f(x)=2x-5$ and $g:R\to R$ defined by $g(x)=\cos x$. Find $f\circ g$ and $g\circ f$. Are they equal.

3. Prove that $P \to (Q \to R) \Rightarrow (P \to Q) \to (P \to R)$.

4. Show that $(T \wedge S)$ can be derived from the premises $P \to Q, Q \to \sim R, R, P \vee (T \wedge S)$ by using indirect method of proof.

5. What are the techniques of Turing machine construction?

6. Find the language generated by the context free grammar $G = (N, T, S, P)$ where $N = \{S\}, T = \{a, b\}, S$ -Starting symbol and $P = \{S \to abb, S \to aSbb\}$.

7. Define the term degree of a vertex. Hence prove that the number of vertices of an odd degree in an undirected graph is always even.

PART B — (5 × 10 = 50 marks)

Answer any FIVE questions.

8. Let $U = \{1, 2, 3, 4, 5, 6\}$ and let $A = \{1, 3, 5\}$; $B = \{1, 2, 6\}$; $C = \{2, 4, 5\}$. Find (a) $A \cup B$ (b) $A \cap B$ (c) $A - B$ (d) B^c (e) Define a relation R from A to A by $(a, b) \in R$ if and only if $a \leq b$. Check whether R is an equivalence relation or not.

9. Given an example of a function $N \to N$ as a set of ordered pairs which is
   (a) one-one but not onto
   (b) onto but not 1-1
   (c) Both one-one and onto
   (d) neither one-one nor onto

10. Define tautology. Hence prove that

$$((P \vee Q) \wedge \sim (\sim P \wedge (\sim Q \vee \sim R))) \vee (\sim P \wedge \sim Q) \vee (\sim P \wedge \sim R)$$

is a tautology.

11. Prove that $R \wedge (P \vee Q)$ is a valid conclusion from the Premises $(P \vee Q), Q \to R, P \to M$ and $\sim M$ by using direct method of proof.

12. Prove that every regular language is accepted by a Finite State Automata.

13. Design a deterministic Finite State automata which will accepts those strings over $\Sigma = \{a, b\}$ where the number of b's is divisible by 3.

14. (a) Prove that in a simple digraph the length of any elementary path is less than or equal to n - 1 where n is the number of vertices. (6)

    (b) Prove that a given graph G is a tree if and only if there is only one elementary path between every pair of vertices. (4)
