

(DMCA101)

ASSIGNMENT - 1

M.C.A. DEGREE EXAMINATION, MARCH 2023

First Year

**INFORMATION TECHNOLOGY
MAXIMUM : 30 MARKS**

ANSWER ALL QUESTIONS

1. Name and describe the components of an information system.
2. Describe the design and functioning of the central processing unit.
3. Explain how software has evolved and trends for the future.
4. Identify seven telecommunications applications and describe how they help the organization attain Competitive advantage.
5. Explain the purpose of Intranets and Extranets.
6. Describe opportunities for strategic use of information systems.
7. Describe how information resources are managed.
8. Distinguish between primary and secondary storage.
9. Discuss the general trends in hardware technology

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ASSIGNMENT - 2

M.C.A. DEGREE EXAMINATION, MARCH 2023

First Year

INFORMATION TECHNOLOGY
MAXIMUM : 30 MARKS

ANSWER ALL QUESTIONS

1. Differentiate between the two major types of software.
2. Discuss traditional data file organization and its problems.
3. Differentiate among the three types of distributed processing.
4. Write a short note on electronic mail.
5. What is one-to-one Web Marketing?
6. What is Register?
7. What is Multithreading?
8. List three most common data models.
9. What is spread sheet?

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ASSIGNMENT - 1

M.C.A. DEGREE EXAMINATION, MARCH 2023

First Year

PROGRAMMING WITH C++
MAXIMUM : 30 MARKS

ANSWER ALL QUESTIONS

1. (a) Discuss different operators are supported by C++.
(b) Write a C++ program to find the sum of diagonal elements in 2 – dimensional arrays.
2. Explain declaration of class and object. Write a program for calculating the total marks and grade of the 40 students in a class.
3. What is constructor? Explain characteristics of constructors and types of constructor.
4. Illustrate early binding and late binding with suitable C++ code.
5. (a) Write a function template for finding the minimum value contained in an array.
(b) What is Virtual function? What are the rules for Virtual functions?
6. Describe different data types in C++.
7. Explain about function overriding with example.
8. Illustrate multiple inheritance with suitable example.
9. What is the difference between pointer and reference variable?

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M.C.A. DEGREE EXAMINATION, MARCH 2023

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PROGRAMMING WITH C++
MAXIMUM : 30 MARKS

ANSWER ALL QUESTIONS

1. What is abstract class? How to the protected visibility specifiers to a class member?
2. Describe different unformatted I/O operations.
3. Describe the various file mode options available.
4. Write a C++ program that demonstrate number divided by zero exception.
5. Define operator overloading.
6. What is purpose of inline function?
7. Define encapsulation.
8. Define exception.
9. Define typecasting.

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ASSIGNMENT - 1

M.C.A. DEGREE EXAMINATION, MARCH 2023

First Year

COMPUTER ORGANIZATION
MAXIMUM : 30 MARKS

ANSWER ALL QUESTIONS

1. What is the key distinguishing feature of a microprocessor?
2. List and briefly define the PCIe protocol layers.
3. How are data read from a magnetic disk and data written onto a magnetic disk?
4. (a) What is the sign-extension rule for twos complement numbers?
(b) How can you form the negation of an integer in twos complement representation?
5. Discuss the principle behind instruction pipelining and how it works in practice.
6. What are the four main functions of a computer?
7. What is a stored program computer?
8. List and briefly define two approaches to dealing with multiple interrupts.
9. Explain serpentine recording.

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M.C.A. DEGREE EXAMINATION, MARCH 2023

First Year

COMPUTER ORGANIZATION
MAXIMUM : 30 MARKS

ANSWER ALL QUESTIONS

1. Define the terms track, cylinder, and sector.
2. Represent the following decimal numbers in both binary sign/magnitude and twos complement using 16 bits: + 512; -29.
3. What are the four essential elements of a number in floating-point notation?
4. What is the function of condition codes?
5. Define embedded systems.
6. Define MBR.
7. What is the typical disk sector size?
8. Define mantissa.
9. What is Delayed branch?

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ASSIGNMENT - 1

M.C.A. DEGREE EXAMINATION, MARCH 2023

First Year

DATA STRUCTURES
MAXIMUM : 30 MARKS

ANSWER ALL QUESTIONS

1. Discuss about algorithm development steps. Write an algorithm to find maximum and minimum element of given list of elements.
2. Explain about different string matching algorithms.
3. Explain the representation of a linked list in memory and also explain how to insert and delete list in a circular linked list with an example.
4. Develop a binary search tree resulting after inserting the following integer keys 49, 27, 12, 11,33,77,26,56,23,6 (a) Check whether the tree is almost complete or not? (b) Determine the height of the tree (c) Write post order and preorder traversals.
5. Explain heap sort algorithm. Apply heap sort algorithm to sort following list of elements in ascending order: 9, 3, 5, 27, 4, 67, 18, 31, 13, 20, 39, 21. Clearly show the sorting process at each step.
6. Describe linear and non - linear data structures.
7. Write about Abstract data model.
8. How the memory is allocated for two dimensional arrays?
9. What is binary tree? Explain the different types of binary trees.

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M.C.A. DEGREE EXAMINATION, MARCH 2023

First Year

DATA STRUCTURES
MAXIMUM : 30 MARKS

ANSWER ALL QUESTIONS

1. Write an algorithm for linear search.
2. Explain the operations of queue with an example.
3. Covert the prefix expression $-/ab*+bcd$ into infix expression
4. Explain deletion in an AVL tree with a suitable example.
5. Define pointer.
6. Define record.
7. What is double linked list?
8. Give the applications of stack.
9. Define B-tree.

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ASSIGNMENT - 1

M.C.A. DEGREE EXAMINATION, MARCH 2023

First Year

OPERATING SYSTEMS
MAXIMUM : 30 MARKS

ANSWER ALL QUESTIONS

1. (a) What are the functionalities of Operating Systems? Explain in detail.
(b) How many different states a process has? Explain when a process changes the state with a state diagram?
2. Explain in detail Readers and Writers Problem of Synchronization.
3. Compose FCFS, SJF and Round robin algorithms by computing average waiting time. There are 5 processes with CPU burst time as 10, 5, 17, 25, 6 and arrival times are 0, 1, 3, 2, 7 units. Assume time quantum for round robin scheduling as 5.
4. Explain the indexed and linked file allocation methods. Discuss the advantages and Disadvantages in those methods.
5. (a) Compare the performance of write operations achieved by a RAID level 5 organization with that achieved by a RAID level 0 organizations
(b) Discuss various types of Disk storage attachments.
6. What are the different types of operating systems?
7. Write the principles of protection? And explain the access matrix in detail.
8. What is a scheduler? List and describe different types of schedulers.
9. Write a procedure for handling the page fault in demand paging.

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M.C.A. DEGREE EXAMINATION, MARCH 2023

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OPERATING SYSTEMS
MAXIMUM : 30 MARKS

ANSWER ALL QUESTIONS

1. Write short notes on I/O buffering.
2. How can a system recover from a deadlock? Explain.
3. Differentiate physical and logical memory.
4. Describe SSTF Disk Scheduling scheme.
5. Define thread.
6. Define page fault.
7. Define role-based access control.
8. Define semaphores.
9. Define the terms seek time.

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ASSIGNMENT - 1

M.C.A. DEGREE EXAMINATION, MARCH 2023

First Year

DATABASE MANAGEMENT SYSTEMS

MAXIMUM : 30 MARKS

ANSWER ALL QUESTIONS

1. What is information system? Describe different components of information system and also give various types of information system.
2. What is normalization? Explain about different normal forms with example.
3. Discuss about hierarchical, network and relational data models with suitable example.
4. What is meant by PC - FOCUS? Explain about PC - FOCUS manipulation and PC – FOCUS description.
5. What is locking? Discuss different types of locking mechanisms in DBMS.
6. Describe various symbols used to represent database action diagrams.
7. Explain one-to-one and many-to-one association between files with example.
8. What is pointer? Write about different types of pointers.
9. Describe the ring and invert list data structures.

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ASSIGNMENT - 2

M.C.A. DEGREE EXAMINATION, MARCH 2023

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DATABASE MANAGEMENT SYSTEMS

MAXIMUM : 30 MARKS

ANSWER ALL QUESTIONS

1. State and explain database design steps.
2. Describe different DDL commands in Relational model with syntax.
3. Briefly explain about integrated database management system (IDMS).
4. Describe the different transaction properties.
5. Define Primary key.
6. What is decision support system?
7. Define conceptual data model.
8. What is relational algebra?
9. Define Concurrency.

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ASSIGNMENT - 1

M.C.A. DEGREE EXAMINATION, MARCH 2023

First Year

ACCOUNTS AND FINANCE
MAXIMUM : 30 MARKS

ANSWER ALL QUESTIONS

1. What are the advantages of Double Entry System?
2. What is meant by Trial Balance? Prepare a model of Trial Balance with imaginary figures.
3. Define Cost. Explain about classification of costs.
4. Discuss in detail about Functions of Finance.
5. Define 'Working Capital'. How do you identify the requirement of working capital in a manufacturing organisation?
6. Accounting concepts.
7. Single Entry System.
8. BRS.
9. RBD.

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ASSIGNMENT - 2

M.C.A. DEGREE EXAMINATION, MARCH 2023

First Year

ACCOUNTS AND FINANCE

MAXIMUM : 30 MARKS

ANSWER ALL QUESTIONS

1. Trading Account.
2. Fixed Cost.
3. Need for Financial Analysis.
4. Liquidity Ratio.
5. Three columned Cash Books.
6. P & L A/c.
7. Variable Cost.
8. Finance Manager.
9. Fixed Capital.

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ASSIGNMENT - 1

M.C.A. DEGREE EXAMINATION, MARCH 2023

First Year

DISCRETE MATHEMATICS
MAXIMUM : 30 MARKS

ANSWER ALL QUESTIONS

1. (a) Prove that any propositions p, q, r the compound proposition $\{p \rightarrow (q \rightarrow r)\} \rightarrow \{(p \rightarrow q) \rightarrow (p \rightarrow r)\}$ is tautology.
(b) Test the validity of the following argument :
If I study, I will not fail in the examination
If I don't watch TV in the evenings, I will study
I failed in the examination.
Therefore, I must have watched TV in the evenings.
2. (a) What is extended Pigeon hole principle. Show that if any 30 students are selected, then you may choose a subset of 5 so that all were born on same day of the week.
(b) Solve the recurrence relation :
 $a_{n+2} + 3a_{n+1} + 2a_n = 3^n, n \geq 0.$

3. (a) Let $A = \{1, 2, 3, 4\}$ and relation $R = \{(1, 2), (2, 1), (2, 3), (3, 4), (4, 4)\}$. Find matrix of transitive closure of R by using Warshall's algorithm.
- (b) On the set Z of all integers, a relation R is defined by aRb if and only if $a^2 = b^2$. Verify that R is equivalence relation. Determine the partition induced by this relation.

4. (a) Determine the co-efficient of x^{20} in $(x^2 + x^3 + x^4 + x^5 + x^6)^5$.

- (b) In any group $(G, *)$, by proving the inverse of every element is unique. Show that

$$(a * b)^{-1} = b^{-1} * a^{-1}, \forall a, b \in G$$

5. (a) Draw the logic circuit for the expression $X = ABC + A'C' + B'C'$.

- (b) Draw the K-maps of these sum-of-products expansions in three variables :

$$xyz + xyz' + x'yz' + x'y'z$$

6. Show that $(p \rightarrow (q \rightarrow r)) \equiv ((p \rightarrow q) \rightarrow (p \rightarrow r))$.

7. Prove the laws of idempotent, commutative, associative and absorption in a lattice.

8. Solve the recurrence relation using generating function :

$$a_n - a_{n-1} = 3(n-1), n \geq 1 \text{ and where } a_0 = 2.$$

9. From 6 boys and 4 girls, 5 are to be selected for admission for a particular course. In that how many ways can this be done if there must be exactly 2 girls?

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ASSIGNMENT - 2

M.C.A. DEGREE EXAMINATION, MARCH 2023

First Year

DISCRETE MATHEMATICS
MAXIMUM : 30 MARKS

ANSWER ALL QUESTIONS

1. Let $X = \{1, 2, 3, 4\}$ and $R = \{(x, y) \mid x > y\}$. Draw the graph of R and also give its matrix representation.
2. Describe the properties of relations.
3. Show that $a.b + a'.b' = (a' + b).(a + b')$ in Boolean algebra.
4. Determine the number of integer solutions to the equation $x_1 + x_2 + x_3 + x_4 = 7$, where $x_i > 0 \forall i = 1, 2, 3, 4$.
5. Define sub group.
6. Define conjunctive normal form.
7. What is meant by Boolean lattice?
8. Find how many different words that can be formed with the letters in the word : "SUCCESS"?
9. Define POSET.