

**MCA [Management] -2020 Pattern**  
**Sample Questions**

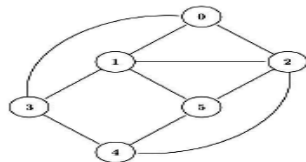
**Semester-I**

**IT11: Java Programming**

1. What is Constructor? Explain how to implement constructor overloading.
2. How to implement Multi Threading Concept.
3. What is Multithreading?
4. Explain Life Cycle of thread and ways to create thread.
5. What are the access modifiers available in java?
6. What is the difference between String and StringBuffer class?
7. Write a program using Collections in java such as ArrayList, Queue or Set.
8. Design a GUI based application using AWT and Event Handling
9. Write a Program to modify records in table and display it using JDBC.
10. Create a login page which has username and password ,if it is correct then perform the arithmetic operations in MainMenu.jsp

**IT12: Data Structure and Algorithms**

1. Create AVL tree by inserting following data:  
69,80,73,40,33,70,1,86,
2. Construct a Binary tree from the given traversals  
Inorder: G D H B E I A C J F K  
Preorder: A B D G H E I C F J K
3. Find out DFS and BFS solution of the following graph



4. Explain the merge sort algorithm in detail with its complexity advantage of quick sort over merge sort
5. Discuss Binary search algorithm with example
6. Explain in detail N queen Problem
7. Solve  $w=(2,4,6,9)$  and  $p=(10,10,12,18)$   $m=15$  0/1 Knapsack problem
8. Explain Tower of Hanoi
9. Implement the stack using linked list
10. Implement the circular queue.

### **IT13 :Object Oriented Software Engineering**

1. Draw the use case diagram for the process sale and specify actors, use case and scenario
2. Health Care Ltd is a system that has the facility of new patient registration & admission as OPD and as an emergency case, availability of ICU, availability of rooms (as per room type like private or general), doctor availability, information related to staff shifts.
  - A) collaboration daigran
  - B) Sequence Diagram
3. Prepare SRS for a Courier Management system
4. Draw an Activity Diagram & 1 GUI screen for Online Pizza Ordering System
5. Explain Rational Unified Process Model.
6. Explain Spiral Model
7. Explain Agile Models
8. Discuss Elements of GUI Design.
9. Explain Agile Process
- 10 Explain Scrum

## **IT-14: Operating Systems Concepts**

1. Explain Types of RTOS
2. Explain Uniform Memory Access (UMA)
3. Explain Deadlock
4. Explain Virtual Memory Concept
5. Discuss File System of Ubuntu
6. Explain various CPU scheduling algorithms in detail.
7. How many page faults occur for FIFO, LRU and Optimal page replacement algorithms for the following reference string with 3 page frames? State which algorithm gives you the minimum no of page faults.  
1 2 3 2 1 5 2 1 6 2 5 6 3 1 3 6 1 2 4 3
8. Explain Types of Multiprocessors Systems in details.
9. Explain Process States
10. Explain Demand Paging

## **IT15 Network Technologies**

- 1) Explain CRC method
- 2) Explain IPV4 Address in detail
- 3) Explain Asymmetric Algorithm
- 4) Explain Berkeley Sockets
- 5) Explain VOIP
- 6) Explain SMTP and its supplementary protocol
- 7) Explain one of the Interior gateway protocol and difference between RIP and OSPF
- 8) Short notes on
  - a) HDLC protocol

- b) TCP and UDP Connections
  - c) SMTP,
  - d) IMAP4 & MIME
- 9) Discuss Major System Calls Used with Sockets
- 10) Explain Socket Abstraction

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**Semester-II**

**IT21: Python Programming**

1. Explain any Four of the following:
  - a) Features of Python
  - b) Modules in Python
  - c) Mutable & immutable
  - d) Explain break, continue and pass of Python
  - e) Lambda Function
2. Explain conditional statements in Python
3. Explain how to access Strings, also various methods associated with it
4. What do you mean by function? Explain function and it's type with suitable example
5. What is dictionary? Explain with suitable example
6. Write a program to open a textfile 'emp1' and 'emp2' and store all the information of both the files in 'emprecord' file
7. Write a program to validate date pattern using regexp (2022-05-11)
8. Write a program to create a derived class current\_account from Account class derived class consist two method deposit and withdraw display the deposit and withdraw amount
9. Write a program to perform basic CRUD operations with MongoDB
10. Short notes on
  - a) Series in pandas
  - b) Visualization Tools
  - c) Universal Array Function

## **IT22 :Software Project Management**

1. Explain COCOMO model in detail
2. Explain Agile Manifesto and Agile Principles
3. Explain any Two Agile Tools
4. Explain Techniques for estimating Story Points and Elaborate Product Vision and Product Roadmap
5. Explain Sprint Burndown Chart and Reports
6. Explain Scrum Master
7. Dynamic System Development Method
8. Benefits of Agile Project Management
9. Define Software Project. Explain Software Project management Process in detail
10. Write Short Notes
  - a) CMM Levels
  - b) MS-Project
  - c) Quality Metrics

## **MT21: Optimization Techniques**

1. Minimize  $Z = -2x - 3y - 4z$

Subject to  $3x + 2y + z \leq 10$   $2x + 5y + 3z \leq 15$   $x, y, z \geq 0$

2. The Required data for a small project consisting of different activities are given

Activity	Dependence	NT (days)	NC(Rs.)	CT(days)	CC(Rs.)
A	--	6	300	5	400
B	--	8	400	6	600
C	A	7	400	5	600
D	B	12	1000	4	1400
E	C	8	800	8	800
F	B	7	400	6	500
G	D,E	5	1000	3	1400
H	F	8	500	5	700

Find if the project is to be completed in 21 days with minimum crash cost, which activities should be crashed by how many days.

3. A shop owner has 3 alternative strategies, that he can use for business purpose. Each of these follows 4 possible states. The conditional profit pay offs for each strategy-state combination are as under.

Strategy	States			
	N1	N2	N3	N4
S1	30	10	10	8
S2	40	-15	5	7
S3	50	20	-6	10

Find optimal decision under.

i) Maximax criterion.

ii) Regret criterion.

4. Determine optimal strategy and find value of game

		B's Strategy			
		B1	B2	B3	B4
A's Strategy	A1	2	-2	4	1
	A2	6	1	12	3
	A3	-3	2	0	6
	A4	2	-3	7	1

5. Distinguish between PERT and CPM

6. In a factory, there are six jobs to perform, each of which should go through two machines A and B, in the order A, B. The processing timings (in hours) for the jobs are given here. You are required to determine the sequence for performing the jobs that would minimize the total elapsed time, T. What is the value of T?

Job	1	2	3	4	5	6
Machine A	1	3	8	5	6	3
Machine B	5	6	3	2	2	10

7. We have five jobs, each of which must go through the two machines A and B .Processing times in hours are given in the table below



Job	1	2	3	4	5
Machine A	5	1	9	3	10
Machine B	2	6	7	8	4

Determine the sequence for the five jobs that will minimize the elapsed time.

8. Explain Markov Chains with example

9. Describe Steady state Probabilities and its implications

10. Discuss Types of Decision-making environment

## **IT23Advanced Internet Technologies**

1. What is SVG ? explain any two components of SVG with suitable example
2. Write a PHP script for retrieving top 10 records from the database. Assume suitable data.
3. Write a PHP program to display all the records of "employee " database from the personal table #assume table has 10 records with following fields eid, name ,address, pin , phone , email .
4. What do you mean by Asynchronous API?
5. Why use Node.js?
6. Explain callback in Node.js.
7. How does an Angular application work?
8. What is AOT compilation? What are the advantages of AOT?
9. What is the Box model in CSS? Which CSS properties are a part of it?
10. What are the different types of Selectors in CSS?

## **IT24-Advanced DBMS**

1. Discuss the Problems associated with concurrency Control.
2. Explain Normalization and type of normalization Form.
3. Discuss Key elements of parallel database processing:
4. Discuss Codd's Rule with suitable example.
5. Differentiate between RDBMS, OODBMS and ORDBMS with suitable example.
6. Explain Log based recovery and its need.
7. Discuss in detail about role-based access control for multilevel security.
8. Explain 3 Phase Commit Protocol for DDBMS
9. What is Deadlock? Explain the Deadlock mechanism in detail.
10. Explain the structure of Relational Data Model with suitable example.
11. Write Short Notes on: -
  - a) Generalization,
  - b) Specialization,
  - c) Aggregation.
  - d) Cloud based servers
  - e) ACID properties
  - f) Fragmentation and Replication
  - g) Multimedia Database Architecture
  - h) Types of NOSQL

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**Semester-III**

**IT31-Mobile Application Development**

1. Explain Android Architecture in detail.
2. What is intent? What are the different types of intents? Explain any single type with example.
3. Write an application in android to turn on and off the Bluetooth.
4. Apply CRUD operation in android with proper example.
5. Describe file system in Android.
6. Explain the use of Layouts in android.
7. Explain following widgets
  - a. Button
  - b. EditText
  - c. Spinner
8. Describe advantages of using React Native?
9. How to debug React Native Applications
10. Explain Architecture of Flutter

### **IT32- Data Warehousing and Data Mining**

1. Explain Text Mining and web mining with suitable example.
2. What is Genetic Algorithm?
3. Apply K-means clustering algorithm to divide following data-set into two clusters.

<b>ID</b>	<b>X</b>	<b>Y</b>
11	1	1
12	1.5	2
13	3	4
14	5	7
15	3.5	5
16	4.5	5
17	3.5	4.5

Assuming initial centroids  $C1=\{1,1\}, C2=\{5,7\}$

- 4 Perform KNN classification method on following dataset and predict the class for  $X:(\text{Maths}=6, \text{CS}=?), K=3$

<b>Maths</b>	<b>CS</b>	<b>Result</b>
4	3	Fail

6	7	Pass
7	8	Pass
5	5	Fail
8	8	Pass

5. A database has 5 transactions. Let min sup = 60% and min conf = 80%. TID items bought

T100 {M, O, N, K, E, Y}

T200 {D, O, N, K, E, Y}

T300 {M, A, K, E}

T400 {M, U, C, K, Y}

T500 {C, O, O, K, I, E}

Find all frequent item sets using Apriori.

6. Explain Data Warehouse Architecture. What is ETL?

7. Suppose a company wants to design a data warehouse to facilitate the analysis of moving vehicles in an online analytical processing manner. The company registers huge amounts of auto movement data in the format of (Auto ID, location, speed, time). Each Auto ID represents a vehicle associated with information (e.g., vehicle category, driver category), and each location may be associated with a street in a city. Assume that a street map is available for the city. Represent a data warehouse/star schema to facilitate effective online analytical processing in multidimensional space.

8. Explain classification and Clustering.

9. Discuss Hypercube & Multicubes

10. Explain ETL .

### **IT33:Software Testing and Quality Assurance**

1. Explain Building Blocks of SQA.
2. Write a detailed test plan for Online Food Ordering Mobile APP. The application functionalities are: User registration, login, check restaurants, dishes, price, delivery time, availability etc...
3. Explain BBT and WBT software testing techniques with suitable examples.
4. Define SQA and its activities.
5. Role of testing and its effect on quality
6. Explain V model with different V & V techniques.
7. What is CAST?
8. Explain Appium architecture in detail.
9. Explain Black Box Testing Techniques.
10. Write Short Notes(Any 3)
  - a) Software Reliability
  - b) Defect Life Cycle
  - c) Cyclomatic Complexity
  - d) Static Vs. Dynamic Testing
  - e) QA Vs. QC

### **IT-34 Knowledge Representation and Artificial Intelligence: ML, DL**

1. Briefly describe the meaning of knowledge representation and knowledge acquisition.
2. What procedure is followed for knowledge acquisition?
3. Explain inference rules with example.
4. Translate the following sentence into formulas in predicate logic and clause form
  - a). John likes all kind of food.
  - b) Apples are food.
  - c) Chicken is food.
  - d) Anything any one eats and is not killed by is food.
  - f) Bill eats peanuts and is still alive
  - g) Sue eats everything Bill eats.
5. Determine whether the following argument is valid. "If I work whole night on this problem, then I can solve it. If I solve the problem, then I will understand the topic. Therefore, I will work whole night on this problem, then I will understand the topic"
6. Consider the argument," All dogs bark. Some animals are dogs. Therefore, some animals bark".  
Determine whether the conclusion is a valid consequence of the premises.
7. Explain what is Machine Learning?
8. Discuss Different Types of Machine Learning?
9. Explain a) Support Vector Machines b) Naïve Bayes Classification
10. Explain Field Programmable Gate Array (FPGA)



## **IT35-Cloud Computing**

1. Challenges, characteristics and Applications of Cloud Computing
2. Explain Cloud Service Models: SAAS , IAAS, PAAS,
3. Explain Characteristics of Virtualized Environments Types of Virtualization.
4. Explain Network and storage virtualization
5. Service Oriented Architecture in detail.
6. Explain Web Services: SOAP and REST
7. Explain Cloud Bursting features, applications and cloud bursting Architecture in detail
8. Explain Cloud Deployment Models in detail.
9. Explain Edge Computing Concepts
10. Explain Cloud Governance.

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**Semester-IV**

**IT41-DevOps**

1. What is DevOps?
2. Explain the Importance of Linux in DevOps with suitable example.
3. Explain the GIT. Differentiate between CVCS and DVCS with suitable Example.
4. What is branching? Explain the various steps in creating for the Branches.
5. Explain the various commands needed to test connection between knife and workstation.
6. Explain the various steps that are needed to create Environment also mention how to add servers to the environment.
7. What is the need for Creating Roles also mention the steps for adding Roles to an organization?
8. Explain the steps for creating the Data Bags using CLI and Chef Console.
9. What is Docker? Differentiate between Docker and Virtualization with suitable example.
10. Write Short Notes on: -
  - a) Group ID
  - b) AWS ECS
  - c) Container Routing
  - d) Maven Plugins
  - e) Cookbooks
  - f) Creating Repository
  - g) RPM and YUM

## **BM-41 PPM and OB**

1. What is a Group? Explain in detail the stages of group formation with an example.
2. Explain Social responsibility of management
3. Explain the different factors to be consider for team building.
4. Discuss the Maslow's need Hierarchy theory .
5. Explain different Decision making styles.
  
6. Explain the Five stage Conflict Process
  
7. What is Johari window?
  
8. Define Leadership and explain the different types of leadership styles in detail.
  
9. Explain Herbert Simon's Model
  
10. Discuss – “Management has to adopt scientific approach to solve problems.”