

Total No. of Questions : 5]

SEAT No. :

PE4188

[Total No. of Pages : 2

[6554]-1001

F.Y.M.C.A. (Management)

PPR 501 MJ-IT-11 : PYTHON PROGRAMMING

(2024 Pattern) (Semester - I)

Time : 2½ Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*

Q1) Solve any Two.

[2×5=10]

- a) Write a program to accept number and Repeatedly find the sum of digits until you get a single digit result.
Example : 9965 → 9+9+6+5 → 29 → 2 + 9 → 11 → 1+1 → 2
- b) Write a program to create a list of words from a given string that contain more than 2 vowels.
Input : "Python programming is fun. I like Python programming very much".
Output : ['programming', 'programming']
- c) What is set? Demonstrate union, Intersection. Difference and Symmetric difference of sets.
- d) Write a program to find all the indices of a substring in the given string.

Q2) Solve any Two.

[2×5=10]

- a) Write a user defined function nMax () which will return the maximum between the entered numbers. Also write a main program to take input and display output.
- b) Write a python program that prompts the user to input two numbers and raises a Type Error exception if the inputs are not numerical.
- c) Create a generator which will generate the next prime number from the number passed.
Example-If the number passed is 14, then the next prime number is 17.
- d) Explain the use of any five functions from the date time module with suitable example.

P.T.O.

Q3) Solve any Two.

[2×5=10]

- a) What is inheritance? Explain multilevel inheritance with suitable example.
- b) Write a program to check if a password is strong.
The password must have:
 - i) At least 8 characters
 - ii) At least one uppercase letter
 - iii) At least one lower case letter
 - iv) At least one digit
 - v) At least one special character (@, #, \$, %, &)
- c) Write a multithreading program, where one thread prints square of a number and another thread prints cube of numbers. Also display the total time taken for execution.
- d) What is operator overloading? Explain with suitable example.

Q4) Write a MongoDB program to create a vehicles collection with fields: VehicleID, Model, Type, Price, Mileage.

[10]

Perform the following :

- a) Insert 5 vehicle documents.
- b) Find vehicles with price between 20000 and 50000
- c) Update the Mileage of the vehicle whose Vehicle ID is 2.
- d) Display top 3 Vehicles according to price.
- e) Display vehicles with highest Mileage.
- f) Find all vehicles of Type 'SUV'.
- g) Display all vehicles in descending order of price.

Q5) Solve any Two.

[2×5=10]

- a) Explain the use of Django Rest Framework (DRF) for building APIs.
- b) Write a short note on Django Admin interface .
- c) Create a Django form class contact Form with fields: name, email and message and display it in an HTML template.
- d) Write a Django model with a foreign key relationship between Author and Book tables.



Total No. of Questions : 5]

SEAT No. :

PE-4189

[Total No. of Pages : 2

[6554]-1002

M.C.A. (Management)

**DSA502MJ-12 : DATA STRUCTURE AND ALGORITHMS
(2024 Pattern) (Semester - I)**

Time : 2½ Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *All questions carry equal marks.*
- 2) *All questions are compulsory.*

Q1) a) Write an algorithm to find and print sum and average of array elements. **[6]**

b) Explain memory allocation & indexing of a 1-D array. **[4]**

OR

c) Write an algorithm to insert an element at the beginning of the list. **[6]**

d) Write an algorithm to concatenate two strings. **[4]**

Q2) a) Write an algorithm to print sum of even and odd node elements in singly link list. **[6]**

b) Differentiate between singly Link List & Doubly Link List. **[4]**

OR

c) Write an algorithm to insert an element in the doubly link list at a given position. **[6]**

d) Explain in brief applications of a circular linked list. **[4]**

Q3) a) Write an algorithm to perform all operations of a stack using linked list. **[6]**

b) Explain applications of queue with suitable example. **[4]**

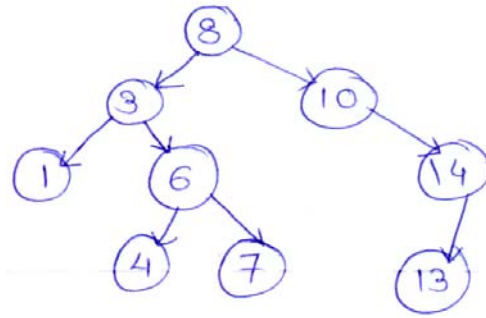
OR

c) Convert the following infix expression to postfix expression using stack
 $A * (B * C + D * E) + F$ **[6]**

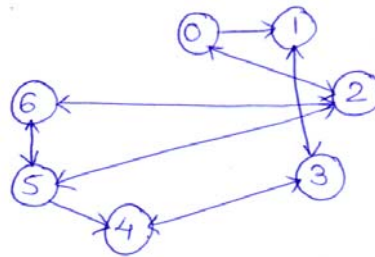
d) Differentiate between stack and queue. **[4]**

P.T.O.

- Q4) a)** For the given binary search tree write recursive algorithms to print the inorder, preorder and post order traversals. [6]

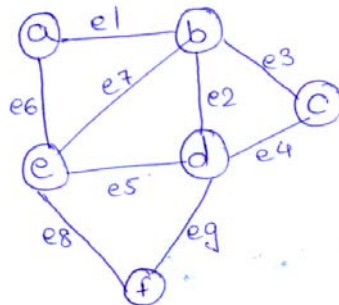


- b)** In the given directed graph find out in-degree, out - degree and total degree of graph. [4]



OR

- c)** Create an AVL tree by inserting the values 48, 72, 36, 8, 79, 22, 84, 66. Write a recursive algorithm to explain the insertion and balancing process using proper rotation techniques. [6]
- d)** Give the Adjacency Matrix and linked list representation of undirected graph. [4]



- Q5) a)** Write an algorithm to sort given array using merge sort. [6]
20, 18, 23, 38, 5, 11, 9, 21, 30, 4.
- b)** Discuss Min heap and max heap with suitable example. [4]

OR

- c)** Consider the array : 7, 10, 13, 17, 20, 23, 26, 29, 32. Element to search : 29 apply interpolation search algorithm. [6]
- d)** Discuss Hash functions with suitable example. [4]



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SEAT No. :

PE4190

[Total No. of Pages : 2

[6554]-1003

M.C.A. - I (Management)

ADB 503 MJ-IT-13 : ADVANCED DBMS

(2024 Pattern) (Semester - I)

Time : 2½ Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*

Q1) A university registrar's office maintaining data about the following entities; Course, including number, title, Credits, Syllabus and prerequisite Course offering including course number, year, semester section number, instructor, timing and calssroom. Students including student-id, name and program and instruction, including identification number, name, department and title. Further the enrollment of student in courses and grades awarded to students in each course they are enrolled for must be appropriately modeled.

- a) Construct the E-R Diagram for following case study [7]

OR

Design the normalized database upto 3NF using above case study
(Described it structured and corytramb) [7]

- b) Attempt any one. [3]
- i) What is data independence with its types?
 - ii) Explain specialization with example.

Q2) a) Explain the term transaction with ACID properties. [5]

- b) Explain lock based pratical with example. [5]

OR

- c) What is deadlock? Explain 4 necessary conditrony. [5]
- d) What is Schedule? Explain its types. [5]

P.T.O.

Q3) a) Why is recovery needed in database? Explain any one of based recovery technique with example. [5]

b) What type of encryption is used by public key infrastructure of by digital certificates? [5]

OR

c) Explain shadow paging in details. [5]

d) Explain Database security in DBMS and its importance. [5]

Q4) a) Explain Inter operational and Intra operational parallelism its details. [5]

b) Explain 2PC commit practical in DDBMS with example. [5]

OR

c) Explain the following term fragmentation and Replication in DDBMS. [5]

d) How Load balancing is active in parallel Database. [5]

Q5) Attempt any two. [10]

a) Explain the features of NOSQL and MongoDB.

b) What is firebase and its uses.

c) Employee (Eid, name, DOJ, Skill)

Dept (Did, Name, Location)

Relation between Employee and Department in many to many.

Solve the following queries using above database.

i) Display all employee who join before 31-Dec-2023

ii) Display employee whose name end with "Kar"
e.g Sudhakar, Dinkar etc.

iii) Display employee name along with deptname.



Total No. of Questions : 5]

SEAT No. :

PE-12203

[Total No. of Pages : 2

[6554]-1003CR
M.C.A.
ADB 503 MJ : ADVANCED DBMS
(2024 Pattern) (Semester - I)

Time : 2½ Hours]

[Max. Marks : 50

Instructions to the candidates :

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicates full marks.*

Q1) a) Case Study :

Organization made up of various departments each having a name, identifying no; and an employee who is the manager. A department may be located in different place. Information about employee includes name, identification number, birth date, address, gender, & salary, each employee is assigned to one department. The date the manager is appointed to a department is also tracked. Employees may be directly supervised by another employee. Each project with in the organization is controlled by some department employees (not necessarily from the controlling dept) are assigned to project information about project includes project name no : and location. Hours spent by employees on each project are also ket. Draw the E-R diagram for the above case & explain the notations & relationship

[7]

OR

Normalize the database with its structure and constraint for the above case study up to 3 NF.

[7]

b) Attempt any one :

[3]

- i) What is data Independent?
- ii) Write a codd rules (any 3).

Q2) a) Explain the states transaction diagram of transaction.

[5]

b) Explain the 2-PL protocol in details.

[5]

OR

c) Write the log-based recovery techniques with example?

[5]

d) Explain the problems in Concurrency control approaches.

[5]

P.T.O.

- Q3)** a) Explain the dead lock concept with example. [5]
b) Explain the database backup systems in details. [5]
OR
c) Write short note on the mandatory access controls. [5]
d) Write short note on Grant & revoking privileges with example. [5]
- Q4)** a) Explain the Inter-query & Intra-Query Parallelism system. [5]
b) Explain different between homogeneous & Heterogeneous database. [5]
OR
c) Explain the parallel database architecture. [5]
d) What is DDBMS? Explain DDBMS Architectures. [5]
- Q5)** Attempt any (two)
- a) Explain the NO-SQL concepts. [5]
b) Write short note on mongo DB & Fire Database. [5]
c) Write the syntax of DDL commands. (any three) [5]



Total No. of Questions : 5]

SEAT No. :

PE-4191

[Total No. of Pages : 4

[6554]-1004

M.C.A. (Management)

BST504MJ : BUSINESS STATISTICS

(2024 Pattern) (Semester - I)

Time : 2½ Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) All questions are compulsory.
- 2) Use of scientific (non-programmable) calculator is allowed.
- 3) Figures to the right indicate full marks.

Q1) a) Solve any one : [5]

- i) Write a note on Scope and Applications of Statistics.
- ii) Write a note on various methods of data collection used in business research.

b) Solve any one : [5]

- i) Represent the following data of Family 'A' by a pie diagram.

Items of Expenditure:	Food	Rent	Clothing	Education	Lighting	Misce.	Saving
Expenditure:	540	180	180	90	40	40	10

- ii) The following data shows the results of statistics of B.Sc.-I examination of Pune university held in November 2001, 2002.

Year	I Class	II Class	Failed
2001	100	300	300
2002	120	400	200

Construct a multiple bar diagram to illustrate the above information.

Q2) a) Solve any one : [5]

- i) Calculate the Q1 and Q3

Weight	10-19	20-29	30-39	40-49	50-59
No. of Apples	3	8	4	2	1

P.T.O.

- ii) Calculate the Median of the given data

Sales Volume	10	20	30	40	50	60
Number of Days	8	23	45	65	75	80

- b) Solve any one : [5]

- i) Calculate Mean Deviation about mode from the following series.

X	10	11	12	13	14
f	3	12	18	12	3

- ii) The weight of 10 ampicillin ampoules in grams is as follows:

12, 13, 12, 14, 13, 14, 15, 14, 12, 11

Calculate Standard Deviation (SD), variance, and coefficient of variation

- Q3)** a) Solve any one : [5]

- i) The probability that a student passes in Mathematics is 0.7, in Statistics is 0.6, and in both subjects is 0.5. Find the probability that 1) student passes in at least one subject, 2) students pass in only mathematics, 3) students pass in only statistics.

- ii) Out of 7 men and 5 women, a committee of 4 is to be formed. Find the number of ways the committee can be formed if it must include at least one woman.

- b) Solve any one : [5]

- i) Heights of students in a college are normally distributed with mean 165 cm and standard deviation 5 cm. Find the probability that a student chosen at random has height

1) between 162 cm and 173 cm

2) greater than 174 cm.

- ii) The number of typing errors per page in the first edition of a textbook follows a Poisson distribution with mean 0.7. Determine the probability that a randomly chosen page in the first edition of this textbook contains 1) exactly 2 typing errors, 2) no error.

Q4) Solve any one :

[10]

- i) Find Karl-Pearson's Coefficient of Correlation between population and pollution.

Populatin in lakhs (X)	10	11	12	13	14
Pollution (Y)	3	12	18	12	3

- ii) A study of wheat prices at Mumbai and Kanpur yield the following data

	Mumbai	Kanpur
Arithmetic mean	35	36
Standard Deviation	0.326	0.207

Correlation coefficient between the prices at Mumbai and Kanpur is 0.774. Estimate the price at Kanpur if the price at Mumbai is Rs.40 using the above data

Q5) Solve any one :

[10]

- i) Apply the method of link relatives to the following data and calculate seasonal indices.

Quarterly Figures

Quarter	1995	1996	1997	1998	1999
I	6.0	5.4	6.8	7.2	6.6
II	6.5	7.9	6.5	5.0	7.3
III	7.8	8.4	9.3	7.5	8.0
IV	8.7	7.3	6.4	8.5	7.1

- ii) A local garden supply store recorded the number of bags of fertilizer (in 1000s) that it sold each month for three years. The data is recorded in the table below.

Month	Year 1	Year 2	Year 3
January	1	3	2
February	2	3	4
March	3	2	3
April	15	11	13
May	13	11	12
June	10	12	9

July	11	9	10
August	9	8	8
September	9	8	12
October	4	4	4
November	4	4	5
December	2	2	1

- a) Calculate the seasonal index for each month.
- b) Identify the average, above-average, and below-average seasons.



Total No. of Questions : 5]

SEAT No. :

PE4192

[Total No. of Pages : 3

[6554]-1005

M.C.A. - I (Management)

SEP 505 MJ : SOFTWARE ENGINEERING AND

PROJECT MANAGEMENT

(2024 Pattern) (Semester - I)

Time : 2½Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *Draw neat diagram wherever necessary.*
- 3) *Figures to the right indicate full marks.*

Q1) a) A reputed hotel chain wants to automate its day-to-day operations such as room booking, guest check-in/check-out, billing, and staff management. Currently, most of these activities are performed manually, leading to inefficiency, delays, and errors. To overcome these issues, the management has decided to develop a Hotel Management System (HMS) that will provide an integrated solution for handling hotel activities through a web and mobile platform.

The system should allow customers to search and book rooms online, receptionists to manage bookings and generate bills, and administrators to manage rooms, staff, and reports. The software must be secure, reliable, and easy to use.

As a system analyst, prepare Software Requirements Specification (SRS) for the proposed Hotel Management System as per IEEE format. **[10]**

OR

b) A reputed educational institution aims to design and implement a comprehensive College ERP (Enterprise Resource Planning) System to automate and integrate its academic and administrative processes. At present, various departments such as Admissions, Academics, Examination, Finance, and Library operate independently, leading to data redundancy, delays, and lack of coordination.

The proposed College ERP System will serve as a centralized platform connecting students, faculty, administrators, and management, ensuring smooth information flow and efficient operations. The system will include modules for student registration, attendance, examination management, fee payment, staff management, and report generation.

Prepare software requirement specification (SRS) in detail as per IEEE format. **[10]**

P.T.O.

Q2) a) A college's Training and Placement Cell aims to develop an online system to manage and streamline student placements and company interactions. The proposed Placement Management System will allow students to register by entering their personal details, academic qualifications, and skill sets. Students can also update their profiles when necessary. Companies/Organizations can register on the platform by providing details about their job openings, eligibility criteria, and other requirements. The system also provides a search facility that allows: **[10]**

- i) Companies to search for suitable candidates based on qualifications or skills.
- ii) Students to search and apply for relevant job opportunities. Draw Use case and Class diagrams for the above case

OR

b) Draw an activity diagram for the following case: **[5]**

A reputed educational institution plans to develop an Online Examination System to conduct assessments efficiently in a digital environment. The system should enable students to register, attempt exams, and receive instant results, while allowing administrators and examiners to manage exams securely and systematically.

The system allows students to:

- i) Log in using valid credentials
- ii) View available exams
- iii) Start and attempt an examination within the given time limit
- iv) Submit the completed test
- v) View their results and feedback after evaluation

The administrator or examiner can:

- i) Create and schedule exams
- ii) Upload questions and set marking schemes
- iii) Monitor ongoing exams
- iv) Publish results

c) Draw Sequence and Collaboration Diagram for sending invitation of programme through telegram. **[5]**

Q3) a) Suppose a project was estimated to be 400 KLOC. Calculate the effort and development time for each of the three model i.e., organic, semi-detached & embedded. **[10]**

OR

b) Compute the function point, productivity, documentation and cost per function point for the following data **[10]**

- Number of user inputs (Avg) = 24
- Number of user outputs (LOW) = 46

- Number of inquiries (high)= 8
- Number of files (Avg) = 4
- Number of external interfaces (Low)= 2
- Effort=36.9p-m
- Technical documents = 265 pages
- User documents = 122 pages
- Cost = \$7744 month
- Various processing complexity factors are: 4, 1, 0, 3, 3, 5, 4, 4, 3, 3, 2, 2,4,5.

Q4) a) Amazon is one of the world's largest e-commerce platforms that enables users to conveniently shop for a wide range of products including electronics, apparel, groceries, books, and household essentials from the comfort of their homes. The system seamlessly connects customers, sellers, delivery agents, and administrators through an integrated mobile and web platform.

As a user of the Amazon system, identify and describe user stories for different user roles Customer, Seller, Delivery Agent, and Administrator. Each user story should represent a key functionality or user requirement that enhances convenience, efficiency, or user experience. **[5]**

b) Describe Agile principles and explain the roles of Scrum Master, Product Owner, Development Team. **[5]**

OR

c) Swift Food is an online food ordering and delivery platform that connects customers, restaurants, and delivery partners through a unified mobile and web application. The main goal of the system is to provide fast, affordable and convenient food delivery to customers while helping restaurants expand their reach and ensuring smooth coordination with delivery personnel.

As a user, identify and describe five user stories for the same. **[5]**

d) Summarize Agile Project Life cycle with Suitable diagram **[5]**

Q5) Write short note on (any two) **[10]**

- GitHub
- Project Backlog
- Agile Tools
- Software Configuration Management



Total No. of Questions : 5]

SEAT No. :

PE-4193

[Total No. of Pages : 2

[6554]-1006
F.Y. M.C.A. (Management)
FCC510MJ - Fundamentals of Cloud Computing
(2024 Pattern) (Semester - I)

Time : 2½ Hours]

[Max. Marks : 50

Instructions to the candidates :

- 1) *All questions are compulsory.*
- 2) *All questions carry equal marks.*

Q1) a) Define cloud computing. Explain its evolution. **[5]**

b) Compare cluster computing Vs. Grid computing. **[5]**

OR

c) Discuss containers. Compare containers with virtual machines. **[5]**

d) Discuss the advantages and disadvantages of cloud computing for businesses and individuals. **[5]**

Q2) a) Explain the different cloud deployment models. **[5]**

b) Explain cloud service models in detail. **[5]**

OR

c) Explain storage as a service and Database as a service in detail. **[5]**

d) Describe the types of cloud storage. **[5]**

P.T.O.

- Q3)** a) What is a Hypervisor? Explain the difference between Type-1 and Type-2 hypervisor. [5]
- b) Explain Xen Hypervisor and its Para-virtualization approach. [5]

OR

- c) Define Machine Image. Explain how VMS are created and managed using machine images. [5]
- d) Describe open - source virtualization managers. [5]
- Q4)** a) Discuss the concept of service oriented architecture. [5]
- b) Explain the concept of Multi Cloud Environment. [5]

OR

- c) What is a Service Level Agreement. [5]
- d) Explain Edge Computing with example. [5]
- Q5) Case study :**

A bank plans to migrate its core banking system to a cloud platform. The system requires high security disaster recovery and real-time transaction processing.

Questions :

- a) Which cloud platform would you recommend and why? [5]
- b) How can cloud bursting be used to handle peak transaction loads during holidays or end-of-month processing? [5]



Total No. of Questions : 5]

SEAT No. :

PE-4194

[Total No. of Pages : 3

[6554]-1007

F.Y. M.C.A. (Management)

EC-11-3-FDS512MJ : FUNDAMENTAL OF DATA SCIENCE
(2024 Pattern) (Semester - I)

Time : 2½ Hours]

[Max. Marks : 50

Instructions to the candidates :

- 1) All questions are compulsory.
- 2) Each question carry equal marks.

Q1) Solve any 2 (two) :

[10]

- a) Explain the evolution of Data Science as a discipline.
- b) Describe the various methods of Data Collection for a Data Science Project.
- c) Discuss the social impact of Data Science in the field of Public Policy and Governance.
- d) Explain the ethical considerations in Data Science.

Q2) Solve any 1 (one) :

[10]

- a) Perform LU Decomposition for the matrix $A = \begin{bmatrix} 2 & 1 \\ 1 & 1 \end{bmatrix}$.

- b) Compute the Eigenvalues of the Matrix $A = \begin{bmatrix} 3 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 1 \end{bmatrix}$

Are the Eigenvectors Linearly Independent?

Q3) Solve any 2 (two) :

[10]

- a) Describe the 'GROUP BY' function in Pandas with a suitable example.
- b) Explain the process of Data Integration. What are the potential issues that can arise?
- c) Discuss Exploratory Data Analysis (EDA)? Why is it a crucial step in a Data Science project?
- d) Propose a data processing model for **Amazon Inventory Management**, detailing how data is collected, cleaned and processed.

P.T.O.

Q4) Solve any 1 (one) :

[10]

- a) Consider the following Dataset and code and Answer the below Questions

Dataset : Monthly Temperature Data (°C)

```
temperature = np.array ([  
    [12, 15, 18, 22, 25, 28, 30, 29, 26, 21, 16, 13], # City A  
    [08, 10, 15, 20, 25, 30, 33, 32, 28, 22, 15, 10], # City B  
    [15, 17, 19, 21, 23, 25, 26, 26, 24, 21, 18, 16] # City C  
])
```

Questions :

- i) Calculate the annual average temperature for each city
 - ii) Find the hottest month for each city
 - iii) Calculate the temperature range (max-min) for each city
 - iv) Identify cities with average temperature $> 20^{\circ}\text{C}$
 - v) Find the month with highest average temperature across all cities
- b) Consider the following code and Answer the below Questions

```
import pandas as pd  
  
employee_data = {  
    'Emp_ID': ['E001', 'E002', 'E003', 'E004', 'E005'],  
    'Name': ['Alice', 'Bob', 'Charlie', 'Diana', 'Eve'],  
    'Department': ['IT', 'HR', 'IT', 'Finance', 'HR'],  
    'Salary': [75000, 65000, 80000, 90000, 60000],  
    'Experience': [5, 3, 7, 10, 2],  
    'Age': [30, 28, 35, 42, 25]  
}  
  
df = pd.DataFrame(employee_data)
```

Questions :

- i) Find the average salary by department
- ii) Filter employees with salary > 70000
- iii) Add a new column. 'Bonus' as 10% of salary
- iv) Find the employee with maximum experience
- v) Group by department and calculate average age and salary

Q5) Solve any 1 (one) :

[10]

- a) Consider the following code and Answer the below Question

E-commerce Customer Data

```
age_groups = ['18-25', '26-35', '36-45', '46-55', '56+']
```

```
purchase_frequency = [15, 25, 18, 12, 8]
```

```
avg_spending = [1200, 2500, 3200, 2800, 2000]
```

```
customer_satisfaction = [3.8, 4.2, 4.5, 4.3, 4.0]
```

```
product_categories = ['Electronics', 'Clothing', 'Books', 'Home', 'Beauty']
```

```
category_sales = [35000, 28000, 15000, 22000, 18000]
```

Questions :

Write a python code to plot **dual-axis plot** showing purchase frequency and average spending by age group

- b) Consider the following code and Answer the below Question **Company Department Data**

```
departments=['IT', 'HR', 'Finance,' 'Marketing,' 'Operations']
```

```
male_employees = [45, 15, 20, 25, 35]
```

```
female_employees = [30, 25, 18, 22, 28]
```

```
salary_ranges = ['20-30K', '30-40K', '40-50K', '50-60K', '60K+']
```

```
employee_count = [25, 40, 35, 20, 15]
```

Questions :

Write a python code to plot **stacked bar chart** showing gender distribution across departments



Total No. of Questions :5]

SEAT No. :

PE4195

[Total No. of Pages : 2

[6554]-1008

F.Y.M.C.A. (Management)

ICE513MJ-E11-4 : INTRODUCTION TO CYBER SECURITY

(2024 Pattern) (Semester-I)

Time :2½ Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *Question number should be clearly mentioned.*
- 3) *Draw neat labeled diagram wherever necessary.*

Q1) a) What is cyberspace how it is different from cybercrime? **[5]**

b) Differentiate between white, black and grey hat hacking. **[5]**

OR

a) Explain various type of cybercrimes. **[5]**

b) Differentiate between Cyber bullying and cyberstalking **[5]**

Q2) a) The Megabiz Corp, is a global player in the e-commerce industry with serveral offices across the world. The breach resulted in a data compromise that impacted customer trust, led to financial losses, and highlighted serveral critical flaws in their network security As an information security expert discover various network vulnerabilities. **[5]**

b) What is Digital footprint? What are its different types compile and explain in brief? **[5]**

OR

a) Kickstart Cooperation Ltd. is a company providing customer and internet banking facilities. Its main customers are some of the biggest banks of USA. Its employees, who have access to all the financial accounts, personal data and ATM card information of approximate 20 million clients of these banks. You have been deputed as Security Administrator and have been allocated the duty to examine the possible security breaches which might occur. What are the different types of threats and vulnerabilities you might identify? **[5]**

b) “The Advanced Persistent Threat pursues its objectives repeatedly over an extended period”. Interpret. **[5]**

P.T.O.

- Q3)** a) The Indosoft trading company is implementing e-SCM, e-CRM and ERP system for their daily operations. You have been asked to identify thefts and frauds w.r.t. above e-SCM, e-CRM and ERP system. [5]
- b) Demonstrate various Financial Frauds. [5]

OR

- a) Government authority is planning to implement online voting system for all types elections of their country. You have been deputed as an IT Security Administrator to identify the possible thefts and frauds in this online voting system. Identify possible thefts and frauds in this context. [5]
- b) List out various Techniques of Identify Theft. [5]

- Q4)** a) Demonstrate various Legal issues in software piracy. [5]
- b) Compile various offences and penalties under IT Act 2000. [5]

OR

- a) Discuss copyright, trademark and patent laws and challenges in digital environment in India. [5]
- b) Illustrate the features of Information Technology Act, 2000. [5]

Q5) Write Short notes. (any two)

- a) Windows password auditor [2×5=10]
- b) Information security policies
- c) BS7799
- d) ISMS



Total No. of Questions : 5]

SEAT No. :

PE4196

[Total No. of Pages : 2

[6554]-1009

F.Y.M.C.A. (Management Faculty)

WDE 511 MJ-EC-11-2 : WEB DEVELOPMENT

(2024 Pattern) (Semester - I)

Time : 2½ Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *All questions are carry equal marks.*

Q1) a) Demonstrate Audio and video tag with appropriate example. **[5]**

b) Apply CSS3 for following. **[5]**

- i) Body background color yellow
- ii) Hyper link without underline.
- iii) Text having 18 font size & color Red
- iv) Anchor active Red, visited blue current Green.
- v) Convert a paragraphs text to capital letters using CSS.

OR

c) Draw line & Rectangle using canvas in htmls? **[5]**

d) What is Bootstrap? Explain feature of Bootstrap. **[5]**

Q2) a) Discuss different techniques for responsive images & media with example? **[5]**

b) Demonstrate Fluid layout techniques with suitable example. **[5]**

OR

c) Write a CSS code using Media queries to manage paragraph layout. **[5]**

d) Write a code to implement web font and icon fonts for responsive design. **[5]**

P.T.O.

- Q3)** a) Create PHP script to upload image and display the uploaded image on separate page. [5]
 b) Implements session based counter that tracks how many times user has visited a specific page? [5]

OR

- c) Explain MVC framework. [5]
 d) How restless API integration works in codeIgniter. [5]

- Q4)** a) Perform the following operations on customer table with suitable fields using MYSQL [10]
 i) Create customer table with constraints
 ii) Insert 5 records.
 iii) Update record of customer whose cust-Id is 201 (update Phone No. & email ID)
 iv) Delete customer records whose city is Pune.

OR

Table user

[10]

b)	id	user name	email	password
	101	James	j@gmail.com	J@123
	102	Smith	S@gmail.com	S@123
	103	King	K@gmail.com	K@123
	104	Ward	W@yahoo.com	W@123

Write my sql queries for following statements

- i) Create the above table with primary key id. and with proper constraints.
 ii) Insert the above records.
 iii) Change the email address of word with W@gmail.com.
 iv) Delete the record whose name is king.
 v) Show the records in ascending order with username.

- Q5)** Solve any two. [10]

- a) Explain File handling in codeIgniter.
 b) Discuss import and export databases using MySQL for deployment purpose.
 c) Explain cookies in codeIgniter.
 d) Explain CSS3 pseudo classes.



Total No. of Questions :5]

SEAT No. :

PE4197

[Total No. of Pages : 2

[6554]-2001

F.Y. M.C.A. (Management)

JPR551MJ-IT 21 : JAVA PROGRAMMING

(2024 Pattern) (Semester-II)

Time :2½ Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) All questions are compulsory.*
- 2) Figures to the right indicate full marks.*

Q1) Attempt any two

- a) Define class student with suitable attributes and methods. Display the student details. **[5]**
- b) Create an abstract class shape with method area(). Inherit this class for creating square class.Display area of square. **[5]**
- c) Write a function using lambda expression to calculate to cube of a given number. **[5]**
- d) Explain use of final keyword for class, data members,methods. **[5]**

Q2) Attempt any two

- a) Explain Thread Life Cycle with suitable diagram. **[5]**
- b) Accept age from user. If age is negative throw Invalid Age exception. (user defined) **[5]**
- c) Demonstrate synchronized keyword with example. **[5]**
- d) Write a program to demonstrate Hashset. Create a Hashset and perform operations add and remove elements. **[5]**

Q3) Attempt any one

- a) Create a Servlet which checks username and password, if it is correct, display message "Successful login," else display appropriate error message (without JDBC) **[10]**
- b) Demonstrate session management using cookies. **[10]**

P.T.O.

Q4) Attempt any one

- a) Create a jsp page to accept roll no.of a student,update mobile number in the student table. Display the updated details. Assume suitable structure. **[10]**
- b) Explain any 5 implicit objects of JSP. **[10]**

Q5) Attempt any one

- a) Create a spring mvc form to read registration details for placement drive with spring validation and display it. **[10]**
- b) Explain Spring mvc flow and Inversion of control (IoC) **[10]**



Total No. of Questions : 5]

SEAT No. :

PE-4198

[Total No. of Pages : 6

[6554]-2002

M.C.A. (Management)

**MT-21-OTE-552 MJ : OPTIMIZATION TECHNIQUES
(2024 Pattern) (Semester - II)**

Time : 2½ Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *Use of statistical table and non-programmable calculator is allowed.*
- 3) *Figures to right indicate full marks.*

Q1) A) Solve the following (Any One) :

[8]

- i) A furniture manufacturing company plans to make two products - chairs and tables from its available resources which consists of 400 board feet of mahogany timber and 450 manhours of labor. It knows that to make a chair requires 5 board feet and 10 man-hours and charges a cost of Rs.45/-, while each table uses 20 board feet and 15 man-hours and charges a cost of Rs. 80/- The problem is to determine how many chairs and tables the company can make keeping within its resources constraints so that it minimizes the cost. Formulate a linear programming model and find an initial basic feasible solution.
- ii) A company produces three kinds of dolls A, B and C. Their monthly production is 1000 units, 2000 units and 3000 units respectively. The dolls are sold through departmental stores X, Y and Z. 1500 units are to be supplied to each of the stores every month.

However, store Z does not want any doll of type A. Profit per unit on the dolls sold to each of the stores is given below.

	Stores		
DOLLS	X	Y	Z
A	15	10	0
B	16	8	9
C	12	9	11

Suggest optimum policy schedule and find the relevant profit.

P.T.O.

B) Explain the following (Any One) : [2]

- i) Optimum Solution
- ii) Feasible Solution in LPP

Q2) A) Solve the following (Any One) : [5]

- i) A manufacturing company processes 6 different jobs on two machines A and B. Number of units of each job and its processing times on A and B are given below. Find the optimal sequence, the Total minimum elapsed time and idle time for each machine

Job	Number of Units of each job	Processing time Machine A	Processing time Machine B
1	3	5	8
2	1	6	4
3	2	6	11
4	4	8	7
5	1	9	12
6	2	6	14

- ii) Find the sequence that minimizes the total time required in performing the following job on three machines in the order BAC. Processing times (in hours) are given in the following table.

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

Also find Total elapse time and Idle time for each machine.

B) Solve the following (Any One) : [5]

- i) A bank operates with a single teller and experiences customer arrivals following a Poisson distribution with an average of 12 customers per hour. The teller takes on an average 4 minutes to serve each customer.
- a) Calculate the utilization factor of the system.
 - b) What is the probability that there are 0 customers in the system (i.e., the system is empty)?
 - c) Compute the expected number of customers in the system at any given time.

- ii) Arrivals at a telephone both are considered to be Poisson at an average time of 6 min between one arrival and the next. The length of the phone call is distributed exponentially, with a mean of 5 min.

Determine :

- Expected waiting time in the queue.
- Expected waiting time in the system.
- Expected number of units in queue that from time to time.

Q3) A) Solve the following (Any One) : [5]

- i) Three companies, A, B and C, compete against each other. The transition matrix T for people switching each month among them is given by the following transition matrix.

	A	B	C
A	0.1	0.3	0.6
B	0.2	0.6	0.2
C	0.10	0.25	0.65

Find the long term distribution?

- ii) In certain market, only two brands of ice creams A, B are sold. Given that a man has last purchased brand A, there is 80% chance that he would buy brand B in next purchase. While if man purchase brand B, there is 90% chance that he would buy same brand A in next purchase.

- Develop transition probability matrix.
- Draw transition diagram.

B) Solve the following (Any One) : [5]

- i) The daily demand for Milk bottles, based on past experience, is given as follows:

Daily Demand	10	20	30	40	50
Cumulative Probability	0.10	0.40	0.65	0.85	1.00

A manager decides to keep 45 Milk bottles in stock. Using the following random numbers: 69, 45, 58, 74, 82, 25, 72, 44, 75, 12, estimate the average balance stock.

- ii) Over 130 days' period, the daily demand of a certain commodity shows the following frequency distribution pattern.

Simulate the demand for 10 days using the random numbers 67, 84, 01, 77, 90, 14, 15, 74, 44, 77. Also find the average demand

Daily Demand	1	2	3	4	5
No. of days	26	13	39	13	39

Q4) A) Solve the following (Any One) : **[8]**

- i) Consider a CPM network with the following project data:

Activity	Duration (days)	Predecessor(s)
A	4	None
B	7	None
C	6	B
D	5	B
E	12	A
F	4	A
G	4	F
H	6	C, E, G
I	2	F

- Draw a network diagram
 - Calculate Critical Path (Perform Forward Pass and Backward Pass calculations)
 - Calculate Free Float for each activity
- ii) Given the following information

Activities	1-2	1-3	1-4	2-6	3-5	4-5	4-7	5-6	5-7	6-8	7-8
Optimistic Time	6	1	1	1	1	1	2	4	4	2	2
Pessimistic Time	8	9	7	3	9	9	8	4	10	14	8
Most Likely Time	7	2	4	2	2	5	2	4	4	5	2

- Construct the project network
- Find the critical path (Perform Forward Pass and Backward Pass calculations) and project variance
- If the probability of completing the project is 0.84, find the expected project completion time?

B) Explain the following (Any One) : [2]

- i) Critical Path
- ii) Earliest Finish Time and Latest Start Time

Q5) A) Solve the following (Any One) : [5]

- i) A grocery receives its weekly supply of eggs every Thursday morning. This shipment must last until the following Thursday when a new shipment is received. Any eggs left unsold by Thursday are destroyed. Eggs sell for \$10 per hundred and cost \$7 per hundred.

The weekly demand for eggs at this grocery varies from week to week. From past experience, the following probability distribution is assigned to weekly demand:

Demand (hundreds of eggs):	11	12	13	14	15
Probability:	0.1	0.2	0.3	0.3	0.1

This pattern of demand remains stable throughout the year. The demand for eggs is not seasonal, and the trend is flat. The problem is: How many eggs should be ordered for delivery every Thursday?

- ii) The following matrix gives the payoff of different conditions (events) E1, E2, E3 and E4 against strategies (alternatives) (A1, A2, A3, A4). Indicate the decision under regret approach if $P(E1) = 0.25$, $P(E2) = 0.35$, $P(E3) = 0.25$, $P(E4) = 0.15$

Find the regret table from the following pay-off table and suggest optimum strategy.

Events / State of Nature / Outcomes	Actions / Strategies			
	A1	A2	A3	A4
E1	20	40	-20	60
E2	30	50	20	320
E3	-20	10	30	310
E4	60	30	110	45

B) Solve the following (Any One) :

[5]

i) Find the optimum strategies of the player in the following game, also find

a) Value of game

b) Optimum strategy for Player A

c) Optimum Strategy for Player B

		Player B		
Player A		B 1	B 2	B 3
	A1	30	40	-80
	A2	0	50	-20
	A3	90	20	50

ii) Find the optimum strategies of the player in the following game, also find

a) Value of game

b) Optimum strategy for Player A

c) Optimum Strategy for Player B

		B		
A		B 1	B 2	B 3
	A1	7	8	5
	A2	6	10	-6
	A3	5	-5	4



Total No. of Questions :5]

SEAT No. :

PE4199

[Total No. of Pages : 2

[6554]-2003

F.Y.M.C.A. (Management)

STQ-553-MJ: SOFTWARE TESTING & QUALITY ASSURANCE

(2024 Pattern) (Semester-II)

Time : 2½ Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*
- 3) *Draw diagrams wherever necessary.*

Q1) a) Describe software Quality Assurance and its challenges. **[5]**

b) Illustrate ISO 9000 standards in SQA **[5]**

OR

c) Distinguish between software quality assurance and software quality control. **[5]**

d) Define Reliability and explain the measures Availability, ROCOF, POFOD **[5]**

Q2) a) Explain the Testing Principles. **[5]**

b) Illustrate V model phases. **[5]**

OR

c) Discuss any five non-functional testing types. **[5]**

d) Differentiate between Re-testing and Regression Testing. **[5]**

Q3) a) You are asked with testing an Age Verification system that accepts the age of a person. The system allows users who are between 18 and 60 years old to access certain features.

Using the Boundry value Analysis technique. **[5]**

i) Determine the number of test cases required to test the above functionality.

ii) Specify the test cases, including representative values and their expected outcomes.

b) Describe static analysis tools and explain its importance. **[5]**

OR

P.T.O.

- c) For the given code, calculate the cyclomatic complexity. [5]
- ```

Read A
If A>0 Then
 If A=21 Then
 Print "Key"
 End If
End If

```
- d) Differentiate between black box and white box testing. [5]

**Q4)** An online learning platform, Knowledge provides interactive courses, video lectures and quizzes. It supports user roles such as students, instructors and administrators. The platform includes features like personalized learning recommendations, discussion forum, progress tracking and integration with third party tools like payment gateways.

- a) Write a test plan for the following sections of the IEEE 829 test plan template for the above application. [10]
- Scope of testing
  - Objectives
  - Risks
  - Strategy
  - Approach

OR

- b) Write suitable test cases for the above application. [10]

- Q5)** a) How can a testing tool be successfully introduced and integrated into an organizations workflow? [5]
- b) Discuss the selenium components-WebDriver and TestNG. [5]

OR

- c) Explain the benefits of JIRA in software Test management. [5]
- d) Narrate the stages of Defect Life cycle with a diagram. [5]



Total No. of Questions : 5]

SEAT No. :

PE-4200

[Total No. of Pages : 2

[6554]-2004

F.Y. M.C.A. (Management)

RMW-554 MJ : RESEARCH METHODOLOGY  
(2024 Pattern) (Semester - II)

Time : 2½ Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) All questions carries equal marks.
- 2) Draw neat diagrams wherever necessary.
- 3) Scientific calculator is allowed.

**Q1)** a) Define Research Methodology and explain its significance in academic and professional contexts. [5]

b) Compare Qualitative and Quantitative research with suitable example.[5]

OR

c) Describe Research Process and Steps explain with diagram. [5]

d) Explain common research methods used in computer applications, providing relevant examples. [5]

**Q2)** a) Elaborate types of research with example. [5]

b) Explain Data Collection methods with suitable example. [5]

OR

c) Write note on Ethics in Research. [5]

d) Define research design with suitable diagram. [5]

**Q3)** a) What is sampling discuss the process of sampling.

Calculate the sample size for a population of 100000. Take confidence level as 95% and margin of error as 5%. [10]

OR

b) Elaborate Probability sampling techniques with advantages and disadvantages. [10]

P.T.O.

**Q4) a)** Discuss Chi - square test.

From the data given below about treatment of 250 patients suffering from a diseases, state whether the new treatment is superior to the conventional treatment.

| Treatment    | Favourable | Non- Favourable | Total |
|--------------|------------|-----------------|-------|
| New          | 140        | 30              | 170   |
| Conventional | 60         | 20              | 80    |
| Total        | 200        | 50              | 250   |

For the above example Formulate null and alternate hypothesis and apply Chi-square test.

(consider: chi - squared value 0.05 significance level at degree of freedom 1 is = 3.84) **[10]**

OR

b) Two types of drugs were used on 6 and 5 patients for reducing their weight.

Drug A was imported & Drug B was Local. The decrease in weight (in kg) after using the drugs for 90 days was given below.

Drug A: 8,10,12,9,14,13

Drug B: 7,9, 14,12,8

Is there significant difference in effectiveness of Drug?

Apply two sample t - test for the above example (consider t value at 0.05 significance = 2.262). **[10]**

**Q5) a)** A MCA student is writing his research report on “Cybersecurity trends and threats”. He has completed his research but is unsure how to structure report. Based on the standard structure of a research report, suggest an appropriate structure for finalizing his research report. **[10]**

OR

b) Prepare an outline for a research on topic “Role of AI in Education “ with proper title , objectives , hypothesis , Research Gap , Data Collection sampling, Result and Discussion and Conclusion. **[10]**



Total No. of Questions : 5]

SEAT No. :

PE-4201

[Total No. of Pages : 2

[6554]-2005

F.Y. M.C.A. (Management)

CCM-560 MJ : CLOUD COMPUTING MANAGEMENT  
AND SECURITY

(2024 Pattern) (Semester - II)

Time : 2½ Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) All questions are compulsory.
- 2) All questions carry equal marks.

**Q1)** a) Define Quality or Service (QoS) and its importance in cloud computing. [5]

b) Define cloud security and explain its significance in cloud environments. [5]

OR

c) Explain the stages of Data Migration in cloud environments. [5]

d) Explain how Multi-Factor Authentication (MFA) enhances access security. [5]

**Q2)** a) Define Data Warehousing and explain its components with suitable diagram. [5]

b) Define a cloud-native file system and its significance in cloud computing. [5]

OR

c) Define high-performance data processing and its importance in big data analytics. [5]

d) Discuss how graph database models in Amazon Neptune differ from traditional models. [5]

P.T.O.

- Q3)** a) Define Virtual Private Network (VPN) and its role in cloud security. [5]  
b) Describe the key components of Identity and Access Management (IAM). [5]

OR

- c) Discuss the role of Intrusion Detection and Prevention System (IDPS) in cloud environments. [5]  
d) Explain the role of AWS Key Management Service (KMS) in cloud security. [5]

- Q4)** a) What are the key steps in Disaster Recovery Planning and Execution?[5]  
b) Describe the different types of database backups available in AWS. [5]

OR

- c) Solve the following case study with appropriate explanation.  
A financial services company faced a data breach when their AWS RDS backups were publicly exposed due to misconfiguration of S3 Bucket policies. How can IAM policies and encryption improve backup security? [10]

**Q5)** Write short notes (Any Two) : [10]

- a) Amazon Light sail.  
b) AWS EC2 Autoscaling.  
c) AWS Lambda  
d) Amazon EC2.



Total No. of Questions : 5]

SEAT No. :

PE-4202

[Total No. of Pages : 3

**[6554]-2006**  
**M.C.A. (Management)**  
**ECS563MJ : Essentials of Cyber Security**  
**(2024 Pattern) (Semester - II)**

*Time : 2½ Hours]*

*[Max. Marks : 50*

*Instructions to the candidates :*

- 1) All questions are compulsory.*
- 2) All questions carry equal marks.*
- 3) Neat diagrams must be drawn wherever necessary.*
- 4) Figures to the right indicate full marks.*
- 5) Your answers will be valued as a whole.*

**Q1) a)** Define the term “cybersecurity” and explain its evolution over the past few decades. **[5]**

b) Why is the CIA triad skill a fundamental model despite the increasing complexity of modern cyber security threats? **[5]**

OR

c) Explain the concept of threat landscape & it’s significance in cybersecurity. **[5]**

d) How can organizations use security management frameworks to assess vulnerabilities and implement effective controls. **[5]**

**Q2) a)** Tech corp experienced a series of small but concerning data breaches over the past years, leading to the loss of customer trust & potential financial penalties. They lacked a clear, comprehensive information security policy and various departments operated with different standards.

What are the various EISP components they should consider to overcome this scenario? **[7]**

b) Differentiate between BCP & DRP. **[3]**

OR

**P.T.O.**

- c) Heritage solutions, A global technology consulting firm with over 5000 employees offers services such as software development, IT infrastructure management and cloud solutions to clients across various industries. The company has recently faced increasing cyber security threats, including a series of phishing attacks that targeted employees and a growing concern about unauthorised access to sensitive client data. The firm's IT infrastructure is extensive & includes internal networks cloud services, end user devices and several proprietary systems used for software development & client management. Firm's existing cyber security policies were generic and didn't provide enough details to adequately secure each system in their diverse network environment. As a result, the company faced several challenges.

How heritage solutions will overcome the challenges by implementing system specific security policy (Sys SP) to address the unique security needs of each system in their corporate network? [7]

- d) What are the key components of secured data transfer in cyber space? [3]

**Q3)** a) Explain risk management in the context of cyber security. [5]

- b) What is the significance of privacy in the digital age and how it is different from confidentiality w.r.t cyber security. [5]

OR

- c) Enlist and explain the main types of cybersecurity tools & technologies used to protect against cyber threats. [5]

- d) Explain the concept of honeypots in cyber security. [5]

**Q4)** a) An IT firm developing application for health care sector facing several security issues and challenges since their establishment. As a cyber security expert examine all possible cyber attacks they face as well as the impact of these attacks. Underline the legal consequences for the different types of issues you found during the investigation. [7]

- b) What are the key components of comprehensive cyber security policy? [3]

OR

- c) A criminal steals a smartphone and misuses it for a range of illegal activities. Being cyber security expert find out all possible ways in which the smart phone can be used by the thief. Also highlight upon the consequences and the steps taken to investigate and resolve the case. [7]
- d) Enlist all possible cyber crimes and allied punishments as per the cyber law. [3]
- Q5)** a) Discuss digital Forensics life cycle with suitable diagram? [5]
- b) What is the process of conducting a Forensic analysis of an email? [5]

OR

- c) What are the major challenges faced by digital Forensics investigators when dealing with encrypted data? [5]
- d) Define threat management and discuss the importance w.r.t cybersecurity. [5]



Total No. of Questions : 5]

SEAT No. :

PE-4203

[Total No. of Pages : 2

[6554]-2007

**M.C.A. (Management Faculty)**

**JS 561MJ : JAVASCRIPT**

**(2024 Pattern) (Semester - II)**

*Time : 2 ½ Hours]*

*[Max. Marks : 50*

*Instructions to the candidates :*

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate marks.*

**Q1) Attempt any Two.**

**[2 × 5 = 10]**

- a) Write Javascript code using function that accept string as argument and returns the number of vowels in given string. **[5]**
- b) Write Javascript program that demonstrate all Javascript iterative statement. **[5]**
- c) Demonstrate Javascript local and Global variables with suitable example. **[5]**

**Q2) Attempt any Two.**

**[2 × 5 = 10]**

- a) Write a program in Javascript that performs keyboard event handling in details. **[5]**
- b) Write a Javascript program to validate following string: MC123-#01, using regular expression. **[5]**
- c) Explain the concept of state in React Component with suitable examples. **[5]**

**Q3) Attempt any Two.**

**[2 × 5 = 10]**

- a) Write a Javascript program that uses a promise to simulate an asynchronous operation that resolves after 2 seconds with the message "operation successful ". Use then () to handle the resolved value and print the message to the console. **[5]**

**P.T.O.**

- b) Write a Javascript class named circle with a property radius and a method calculate circumference ( ) that returns circumference of the circle. Create instance of the circle class and call the method. [5]
- c) Discuss polymorphism with suitable examples. [5]

**Q4) Attempts any Two. [2 × 5 = 10]**

- a) Create a generator function that yields even number starting from 2. Display the first 5 values on the webpage using DOM. [5]
- b) Create a program in Javascript that modify the content of first item in a list and delete last item when separate buttons are clicked. [5]
- c) Demonstrate JSON working with iterators using suitable examples. [5]

**Q5) Attempt any One. [1 × 10 = 10]**

- a) Design and implement a simple To-Do list application using React. The application should allow users to add, edit and delete tasks. Use state management and conditional rendering to manage task status (completed/pending).
- b) Design react App using usestate, use Effect and use Context hooks. Fetch and display a list of users from API use effect & usestate. Implement any theme toggle using use Context.



Total No. of Questions : 5]

SEAT No. :

PE-4204

[Total No. of Pages : 3

**[6554]-2008**  
**M.C.A. (Management)**  
**MLT 562 MJ : MACHINE LEARNING TECHNIQUES**  
**(2024 Pattern) (Semester - II)**

*Time : 2½ Hours]*

*[Max. Marks : 50*

*Instructions to the candidates :*

- 1) *All questions are compulsory.*
- 2) *Scientific calculator is allowed.*
- 3) *Assume dataset wherever necessary.*

**Q1) a)** Differentiate Between Machine Learning and statistical Learning. [5]

b) Explain Evaluation matrix : Accuracy, Precision, Recall & F1 score. [5]

OR

c) Discuss the bias - variance tradeoffs with suitable example. [5]

d) Explain Unsuperised learning and discuss concept of clustering. [5]

**Q2) a) i)** In a binary classification, a classifier correctly predicts 90 instances as positive, incorrectly predicts 15 instances as positive, correctly predicts 90 instances as negative and incorrectly predicts 10 instances as negative Build a confusion matrix and calculate Accuracy and precision. [5]

ii) A small business, wants to analyze the impact of its advertising budget on monthly revenue. Consider the following dataset. [5]

| Advertising spend<br>(₹ 1000r) | Monthly Revenue<br>(₹ 1000s) |
|--------------------------------|------------------------------|
| 10                             | 25                           |
| 20                             | 45                           |
| 30                             | 65                           |
| 40                             | 85                           |
| 50                             | 105                          |

Predict the revenue if the company spends ₹ 60,000 on advertising

OR

*P.T.O.*

b) Consider the following data set.

[10]

| Confident | Studied | Sick | Result |
|-----------|---------|------|--------|
| Yes       | No      | No   | Fail   |
| Yes       | No      | Yes  | Pass   |
| No        | Yes     | Yes  | Fail   |
| No        | Yes     | No   | Pass   |
| Yes       | Yes     | Yes  | Pass   |

Find out whether the object with attribute confident = Yes, Sick = No will 'Fail' or 'Pass' using Bayesian classification.

**Q3) a)** Given the points A(3, 7), B (4, 6), C(5,5), D(6,4), E(7,3), F(6,2), G (7, 2) & H(8,4). Find the core points, border points and outlier using DBSCAN clustering algorithm. Take Eps = 2.5 and Minpts = 3

OR

b) Apply k-means clustering (with  $k = 3$ ) on the following dataset of 2D points. Use the Euclidean distance metric and initialize the centroids at  $C_1 = (1, 2)$ ,  $C_2 = (3, 5)$  and  $C_3 = (6, 4)$

Dataset

| Points | P1 | P2 | P3 | P4 | P5 | P6 |
|--------|----|----|----|----|----|----|
| x      | 1  | 2  | 3  | 5  | 6  | 7  |
| y      | 2  | 4  | 6  | 5  | 4  | 3  |

**Q4) Solve any two :**

a) Consider the following parameter for Q-learning problem ;

[5]

Learning rate  $\alpha = 0.3$

Reward  $r_1 = -5$

Current Q - value  $Q(s_t, a_t) = 2$

Next state's Q value  $Q(s_{t+1}, a_{t+1}) = 3$

Discount factor  $r = 0.95$

How would you update the Q-value for state action pair  $(s_t, a_t)$ ?

b) Describe the working of graph based method in semisupervised learning.[5]

c) Discuss the exploration and exploitation tradeoff in reinforcement learning. [5]

**Q5) a)** A real estate company wants to develop a machine learning model to predict house prices based on various features as below price (Target), location, House size in sq. ft, Number of Bedrooms, year built, parking space, Nearby schools rating. Considering these features perform the following operations. **[10]**

- i) Develop machine learning model in python for above problem
- ii) Identify independent variables and dependent variables
- iii) Explain the importance of data preprocessing before training the model.

OR

**b)** A Banking firm wants to develop a machine learning model to classify loan applications as “Approved” as “Rejected” based on applicants details such as income, credit score, employment status, existing debts, and loan amount requested. Perform the following operations for above case.

- i) Which algorithm is suitable for this case & why? Explain
- ii) Discuss any 3 data preprocessing techniques for the given data
- iii) Develop machine learning model in python for above case/problem.



Total No. of Questions : 5]

SEAT No. :

PE-4205

[Total No. of Pages : 2

**[6554]-2009**

**M.C.A. (Management)**

**AWD 565 MJ : Advance Web Development**

**(2024 Pattern) (Semester - II)**

**Time : 2½ Hours]**

**[Max. Marks : 50**

**Instructions to the candidates :**

- 1) All questions are compulsory.**
- 2) Figures to the right indicate full marks.**

**Q1) a)** Write NodeJS code to perform all asynchronous operations for a given file. **[5]**

b) Create a typescript class named rectangle with properties width & height. Implement a method calculate area that returns the area of rectangle. **[5]**

**OR**

c) Demonstrate the use of url module in NodeJS with example. **[5]**

d) Explain the role of modules & ambients in typescript with suitable example. **[5]**

**Q2) Solve any two :**

**[2 × 5 = 10]**

a) Illustrate angular routing with an example for navigating between home & about-us pages.

b) Explain the concept of pipes in Angular Implement a custom pipe to capitalize word in a sentence.

c) Demonstrate the use of bootstrap in angular with suitable example.

**P.T.O.**

**Q3) Solve any Two :**

**[2 × 5 = 10]**

- a) Create a service in Angular that provides product data & inject it into a component.
- b) Create a reactive form using nested form groups and validate the data on form submission.
- c) Explain async pipe in angular & how does it simplify working with observables.

**Q4) Solve any Two :**

**[2 × 5 = 10]**

- a) Create a static page in Next. JS that displays students information (Assume suitable fields.)
- b) Differentiate between client-side & server-side navigation in Next. JS
- c) Built a multi-component Next. JS application with css modules.

**Q5) Solve any two :**

**[2 × 5 = 10]**

- a) Explain REPL in NodeJS.
- b) Elaborate directives in Angular with suitable example.
- c) Explain methods in Angular premises, with suitable example.
- d) Explain. API routes in Next.JS with suitable example.



Total No. of Questions : 5]

SEAT No. :

PE-4206

[Total No. of Pages : 2

**[6554]-2010**

**F.Y.M.C.A.**

**MANAGEMENT**

**ECS 564 MJ : Essentials of Cloud Computing and Security  
(2024 Pattern) (Semester - II)**

*Time : 2 ½ Hours]*

*[Max. Marks : 50*

*Instructions to the candidates :*

- 1) *All questions are compulsory.*
- 2) *All questions carry equal marks.*

- Q1)** a) Explain how security policies are implemented in cloud computing. [5]
- b) Describe network - level security and its role in cloud infrastructure. [5]

**OR**

- c) Define the concept of cloud Information Security. Explain its significance in cloud computing. [5]
- d) Describe the concept of AAA (Authentication, Authorization, and Accounting) in cloud access management. [5]
- Q2)** a) Explain the steps for creating and deploying a web application using AWS Elastic Beanstalk. [5]
- b) What is an omni cloud? How does it differ from a multi - cloud environment.[5]

**OR**

- c) Difference between cloud computing and Grid Computing . [5]
- d) What is cloud AI? Explain its role in transforming cloud services. [5]

*P.T.O.*

- Q3)** a) Describe the key components of a block chain and their roles. [5]  
b) Explain how Edge computing enhances real time processing in IoT applications. [5]

**OR**

- c) Solve the below case-study with appropriate explanation. IBM Food Trust uses blockchain technology to provide end-to-end supply chain transparency in the food industry. [10]

How blockchain improves food safety, reduces waste, and enhances trust among stakeholders.

- Q4)** a) What is commoditization of data centers? Describe its role in cloud computing. [5]  
b) Discuss the impact of automation and standardization in cloud optimization. [5]

**OR**

- c) What is resource pooling in cloud computing. How does it benefits cloud server providers & users. [5]  
d) Evaluate different Resource Shairing models and their impact on cloud cost efficiency. [5]

**Q5)** Write Short Notes. (Any Two) [10]

- a) Application hosting in GCP  
b) Cloud Migration  
c) Key factors for selecting cloud provider  
d) Common deployment models



Total No. of Questions : 5]

SEAT No. :

PE-4207

[Total No. of Pages : 3

[6554]-2011

M.C.A. (Management Faculty)

EIS567MJ : ESSENTIALS OF INFORMATION  
SECURITY

(2024 Pattern) (Semester - II)

Time : 2½ Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) All questions are compulsory.
- 2) Draw neat labeled diagram wherever necessary.

- Q1) a) What is Domain Name system? Explain its purpose. [5]
- b) Explain the role and importance of virtualization in Information Security. [5]

OR

- c) What is information assurance? Why do we need information assurance. [5]
- d) Explain Microsoft security principles in short. [5]

- Q2) a) Describe the different types of Information Security threats to an organisation. [5]
- b) How do reporting techniques in IT auditing help to identify and address the security vulnerabilities in an organisation. [5]

OR

- c) Explain various roles of IT auditing in ensuring information security. [5]
- d) How does information assurance differ from information security? How do both contribute to the overall security posture of an organisation. [5]

P.T.O.

**Q3) a)** A Tech - startup is growing rapidly and handling sensitive customer data, API keys and intellectual property. However, the company does not have a documented security policy, leading to data leak, weak passwords and insider threats. The CEO has now asked the security team to come up with formal information security policy.

i) What are the essential key elements of security policy to be developed.

ii) How newly developed policy is going to ensure the application security for this start-up. [7]

b) Write short note on : Application Security. [3]

OR

c) Imagine you are the Chief Information Security Officer (CISO) of an organisation. You are supposed to apply the principles of information security governance to create a framework that ensures the security policies and practices are aligned with the organisations overall business goals and compliance requirements.

i) Enlist all possible principles of information security governance.

ii) What are the key elements of information security policy to be considered. [7]

d) Write short note on security architecture in information system. [3]

**Q4) a)** Employees of a government agency received fake emails pretending to be from senior officials, asking them to click on malicious links. As a result hackers gained the access to classified government documents and citizen records. The agency did not have security awareness training policy and employees were not trained to identify various security threats.

i) Identify the various attacks from above scenario.

ii) How concrete email security policies are playing an important role to prevent such attacks. [7]

b) Write short note on Denial of Service Attack (DoS). [3]

OR

- c) A leading bank suffered data breach where cyber criminals stole a sensitive customer data including account details & credit card information. The investigation revealed that attackers exploited weak passwords, unpatched software, vulnerabilities and poor access control. The bank did not have a robust information security policy in place to prevent such incidence.
- i) Which security threats were exploited in this case.
- ii) How the bank is going to implement security policies to mitigate future network attacks. [7]
- d) Write short note on email security. [3]
- Q5)** a) Examine various security parameters for wireless network. [5]
- b) Illustrate threats to network communication. [5]

OR

- c) Illustrate various network security attacks. [5]
- d) Demonstrate various safety measures to ensure operating system security in network. [5]



Total No. of Questions : 5]

SEAT No. :

**PE-4208**

[Total No. of Pages : 3

**[6554]-2012**

**F.Y. M.C.A. (Management)**

**PBI 566 MJ: POWER BI**

**(2024 Pattern) (Semester - II)**

*Time : 2½ Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) Neat digrams must be drawn wherever necessary.*
- 2) Figures to the right indicate full marks.*
- 3) Assume suitable data, if necessary.*

**Q1) Solve Any Two :**

- a) How does Power BI connect to various data sources? [5]
- b) Differentiate between a star schema and a snowhoke schema. [5]
- c) Apply conditional column in Power BI to categorized data based on sales dataset. [5]
- d) Assume the data set content missing values and duplicate records apply appropriate Data cleaning technique. [5]

**Q2) Solve Any Two :**

- a) Analyse how the CALCULATE function works with filtering context.[5]
- b) Analyze the AVERAGE DAX Function to calculate the average sales amount per customer. [5]
- c) Explain the use of slicers and filters in Power BI. [5]
- d) Explain DAX operater with example. [5]

**P.T.O.**

**Q3) Solve Any Two :**

- a) Explain how the KPI visuals contribute to business decision making in Power BI. [5]
- b) Explain the role of Book mark and the selection pane creating interactive report. [5]
- c) Compare and contrast the paginated reports and inter active reports.[5]
- d) Analyse the importance of Grouping and Binding in Power BI. [5]

**Q4) Solve Any Two :**

- a) Use unpivot function to transform column base data set into row base format. [5]
- b) Apply error handling techniques in 'M' query to replace missing values with default values. [5]
- c) Use Power Query to transform a data set a new column that calculate cummulative sales. [5]
- d) Explain merging and appending queries in 'M' query. [5]

**Q5) Solve Any one :**

**[10]**

- a) An educational institution wants to use Power BI to monitor student performance and academic progress. The administration faces difficulties in analyzing student grades attendance trends and subject wise performance. They also wish to identify students who need additional academic support create a Power BI solution for this problem.
  - i) Write steps/code to connect with academic database (e.g.student records, subject wise marks attendance logs)
  - ii) Write steps/code to clean the data (e.g. remove duplicates format grade values handle missing attendance)
  - iii) Write 2 DAX measures to calculate academic performance (e.g. average grades, attendance percentage)
  - iv) Write 2 M queries for filtering under performing students and merging subject & performance data.
  - v) Draw a sample Power BI dash board per the save.

OR

- b) Reliance Industry Limited (RIL), one of India's largest e-commerce platforms, wants to optimize its sales customer experience and supply chain using data driven insights. The company is facing challenges in tracking real time sales, managing inventory efficiently and improve customer satisfaction to address these challenges RIL asked you to implement Power BI for data visualization and analytics. So provide the solution related to :
- i) Write steps/code to connect with the data.
  - ii) Write steps/code to perform some basic data cleaning tasks.
  - iii) Write atleast 2 DAX function for solving the problems mentioned above.
  - iv) Write 2 M queries to perform any type of filtering, sorting, grouping etc.
  - v) Draw a sample Power BI dashboard for the same.



Total No. of Questions : 5]

SEAT No. :

PE-4209

[Total No. of Pages : 2

[6554] - 3001

S.Y.M.C.A. (Management Faculty)

OBE601MJ : Organizational Behaviour

(2024 Pattern) (Semester - III)

Time : 2 ½ Hours]

[Max. Marks : 50

Instructions to the candidates :

- 1) All questions are compulsory.
- 2) Draw neat diagram wherever necessary.

- Q1) a) Explore how the personal, environmental and psychological factors affecting individual behaviour? [5]
- b) What is perception? Describe the factors influencing perception and the perceptual process. [5]

OR

- c) How can understanding the Big Five Personality Traits help managers to improve team performance and workplace dynamics? [5]
- d) How does emotional intelligence help in teamwork? [5]
- Q2) a) Ms. Vaishali a project manager in a reputed IT firm, has been working under continuous pressure to meet tight deadlines. Over the past few weeks, he has started experiencing symptoms such as anxiety, sleeplessness and irritability. Her team members have observed a noticeable decline in his performance, communication and overall attitude at work. The increasing workload and constant pressure have begun to affect both his personal and professional well-being. [10]

Identify sources of stress, types of stress, impact of stress and suggest stress management strategies for the same.

OR

- b) Analyze the five stages of conflict. Being a team member you are having conflicts among the team how you as an individual can resolve the conflicts? [10]

P.T.O.

- Q3) a)** Apply the decision-making process to address challenges arising in natural disaster management and the farming sector. Explain each step of the process with suitable examples. How can the associated risks and uncertainties be identified, minimized and resolved effectively? **[10]**

**OR**

- b) As a project manager, you might be required to take different decisions. Please specify different decision taking environments and decision making process in detail. **[10]**

- Q4) a)** Ms. Meena is a renowned entrepreneur who built a thriving technology start-up through his perseverance, strategic vision, and consistent effort. Discuss how Maslow's Hierarchy of Needs theory can be related to and interpreted through the various stages of Ms.Meena's personal and professional growth. **[10]**

**OR**

- b) In a project team, members often make independent decisions without consulting others, resulting in miscommunication, conflicting outcomes, and unclear responsibilities.
- Apply your understanding of individual and group decision-making to analyze this situation. **[10]**
  - Explain how the decision-making process can be improved through effective communication, coordination and collaboration to achieve better project results.

- Q5) Write Note on (Any Two)** **[10]**

- a) Emotional Intelligence and Effective Leadership.
- b) Key characteristics of an Agile Leader.
- c) Impact of Artificial Intelligence on Organizational Culture.
- d) Sustainability and Green Organizational changes.



Total No. of Questions : 5]

SEAT No. :

PE-4210

[Total No. of Pages : 2

[6554]-3002

M.C.A. (Management)

**DAA602MJ : DESIGN AND ANALYSIS OF ALGORITHMS  
(2024 Pattern) (Semester - III)**

*Time : 2½ Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *Each question has an internal choice.*
- 3) *Assume any suitable data if necessary.*
- 4) *Use of non programmable calculator is allowed.*

**Q1)** Answer any two questions :

- a) What are Asymptotic notations? Explain Big O, Omega and Theta notations with suitable mathematical and graphical representations. [5]
- b) Differentiate between divide & conquer strategy and Greedy method. [5]
- c) Explain KMP algorithm with an example. [5]

**Q2)** a) Write an algorithm for Randomized Quicksort. [5]

- b) Apply Min Max algorithm to find both minimum & maximum element in the given array.

[22, 13, -5, -8, 15, 60, 17, 31]

Show recursive division & calculate comparison. [5]

OR

- c) Solve the given recurrence relation using Master's theorem. [10]

i)  $T(n) = 2T(n/2) + n$

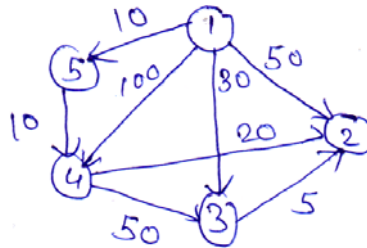
ii)  $T(n) = 9T(n/3) + n^2$

**P.T.O.**

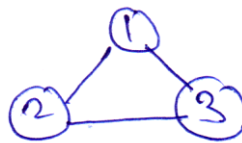
- Q3)** a) Find an optimal solution for the given Knapsack problem instance  $n = 4$  objects and the capacity of Knapsack  $m = 15$ , profits = (10, 5, 7, 11) and weight = (3, 4, 3, 5). [5]
- b) Find an optimal binary merge pattern to merge files whose lengths are 20, 30, 10, 5, 30. [5]

OR

- c) Apply Dijkstra's algorithm to find the length of shortest paths from source vertex 1 to all remaining vertices in the given digraph. [10]



- Q4)** a) Given 2 strings  $X = \text{"STONE"}$  and  $Y = \text{"LONGEST"}$  find the LCS using Dynamic programming. [5]
- b) Draw a state space tree for the given graph with nodes  $(n) = 3$  and colors  $(m) = 3$  using graph coloring algorithm. [5]



OR

- c) Explain the Backtracking approach used in solving the subset sum problem. [10]

**Q5)** Answer any two questions :

- a) Explain Deterministic and Non-Deterministic algorithm. [5]
- b) Write short note on Approximation algorithm. [5]
- c) Explain Genetic Algorithm (GA) with suitable example. [5]

\*\*\*

Total No. of Questions : 5]

SEAT No. :

PE-4211

[Total No. of Pages : 2

**[6554]-3003**  
**M.C.A. (Management)**  
**CAS-610-MJ: CLOUD API's AND SERVICES**  
**(2024 Pattern) (Semester - III)**

*Time : 2½ Hours]*

*[Max. Marks : 50*

*Instructions to the candidates :*

- 1) *All questions are compulsory.*
- 2) *All questions carry equal marks.*

**Q1)** a) Explain the role of cloud API's in cloud computing with suitable examples. [5]

b) Explain the benefits of cloud API's [5]

OR

c) Describe the stages of API's lifecycle management process. [5]

d) What are GraphQL and SOAP API's with example. [5]

**Q2)** a) Illustrate cloud API development using Azure functions with example.[5]

b) Compare different API security mechanisms and discuss best practices to protect API's [5]

OR

c) Describe the working of OAuth 2.0,JWT and API keys. [5]

d) Describe the features of JMeter and its role in API testing. [5]

**Q3)** a) Explain how AI and ML services are provided in the cloud by Google cloud. [5]

b) Compare AWS recognition and Azure computer vision in terms of Features and Applications [5]

OR

c) Describe the features of Google Natural Language API with examples.[5]

d) How do speech recognition and synthesis API's such as AWS polly and Google Speech-to- Text work. [5]

**P.T.O.**

- Q4)** a) Discuss security challenges of cloud API's and their impact on cloud-based applications. [5]
- b) Explain event-driven programming in the cloud with reference to Azure Event Grid. [5]

OR

- c) Explain serverless databases like firebase and DynamoDB. [5]
- d) Compare Monolithic and Microservices Architectures. [5]
- Q5)** a) Discuss how cloud API's are used in healthcare systems for data sharing and patient services. [5]
- b) Discuss the future of cloud API's with respect to automation and AI-driven development. [5]

OR

- c) Solve the following case study :

ShopEase, a fast-growing e-commerce company, wanted to improve customer engagement and sales through real-time personalization. The management realized that customer review and browsing history could be used to offer better product recommendations and targeted offers, but they lacked the infrastructure to process and analyze this data efficiently.

Questions:

- i) The main challenges faced by Shop Ease were related to scalability, data processing and response time. [5]
- ii) Another major challenges was integrating artificial intelligence models with the existing API infrastructure while ensuring the privacy of user data and compliance with security regulations. [5]



Total No. of Questions :5]

SEAT No. :

**PE4212**

[Total No. of Pages : 3

**[6554]-3004**

**S.Y.M.C.A. (Management)**

**EPS613 MJ : END-POINT SECURITY**

**(2024 Pattern) (Semester-III)**

*Time : 2½ Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) All questions are compulsory.*
- 2) Figures to the right indicate full marks.*

**Q1) Solve any two**

- a) Define endpoint security and list three types of endpoints, explaining their importance in organizational data protection. **[5]**
- b) Describe how data loss prevention (DLP) Functions as endpoints protection technology and why it is crucial for compliance in organizations. **[5]**
- c) Evaluate the effectiveness of antivirus/antimalware software for endpoint protection, using criteria like threat detection rates **[5]**

**Q2) a)** Define the three main types of network security controls and provide an example of each, explaining their role in endpoint protection. **[5]**

- b) Compare SSL/TLS and IPsec protocols analyzing their use cases, strengths, and limitations for secure endpoint communications. **[5]**

**OR**

- c) CASE Study **[10]**

A medium-sized IT company, Technova solutions, suffered a data breach when a junior software developer accessed confidential client data from the internal CRM database. The company had granted all developers administrative access to the database for convenience. No role based access controls (RBAC) were implemented.

**P.T.O.**

Discuss the following Questions.

- i) Which access control principle was violated
- ii) How could Role-Based Access control (RBAC) have prevented this breach?
- iii) What administrative measures should the company adopt?
- iv) How can logging and monitoring help in such cases?

**Q3) Solve any Two**

- a) What is multi-factor authentication (MFA)? List its components and describe its importance in addressing password weaknesses [5]
- b) Evaluate the effectiveness of file-level encryption for protecting sensitive data on endpoints, using criteria like performance and granularity [5]
- c) Explain the Break down role of VPNs in encrypted communications, identifying how they integrate with endpoint authentication. [5]

**Q4) Solve any two**

- a) Recall the importance of patch management and list three tools for automated patching, with examples of their configuration. [5]
- b) Compare CIS Controls and ISO/IEC 27001 standards, analysing their applications and differences in endpoint security for hybrid environment [5]
- c) Analyse challenges in minimizing attack surfaces on IoT devices, using hardening techniques and patch management as examples. [5]

- Q5)**
- a) Evaluate the effectiveness of VPNs for securing remote endpoints, using criteria like encryption strength and ease of use. [5]
  - b) Analyse the role of IoT in emerging endpoint security trends, including challenges, AI/ML applications, and integration with NGEP. [5]

OR

c) CASE STUDY

[10]

Sunrise Institute of technology introduce a BYOD policy allowing students and faculty to use their personal devices to access online learning platforms, internal portals, and digital libraries. After a few months, the IT department noticed increased malware infections unauthorized File sharing, and network slowdowns, some students even accesses restricted administrative data due to weak access control.

- i) Identify the major security challenges faced by the Institute after implement BYOD
- ii) Explain how Access control models (RBAC, MAC, or DAC) could help prevent unauthorized access.
- iii) Suggest technical and administrative controls that the institution can apply to secure its BYOD environment.



Total No. of Questions :5]

SEAT No. :

**PE4213**

[Total No. of Pages : 2

**[6554]-3005**

**S.Y.M.C.A. (Management)**

**MAD 611 MJ : MOBILE APPLICATION DEVELOPMENT**

**(2024 Pattern) (Semester-III)**

*Time : 2½ Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*

**Q1) Describe Android Architecture in detail. [10]**

OR

a) Explain web view in detail. [5]

b) Write a short note on - Linear Layout [5]

**Q2) Write an android application to check username & Password are correct. If credentials are matched show “welcome Home” Screen to user. (use Intent) [10]**

OR

What is menu? Explain different types of menus. [10]

**Q3) Write an android application with SQLite database for voter Registration cancellation consider = V\_id, V\_name, V\_gender V\_mobile as a field. Delete the record for the V\_id provided by user. [10]**

OR

Write an android activity that fetches all user records from firebase & displays them on a list view. [10]

**P.T.O.**

**Q4)** Explain component based architecture of react native in detail. **[10]**

OR

a) What is JSX? Explain JSX with syntax. **[5]**

b) Write a short note on-state management in react native. **[5]**

**Q5)** Describe flutter Architecture in detail. **[10]**

OR

Create a registration form using text field, checkbox, & Radio Button in flutter. Display the entered data in a dialog. **[10]**



Total No. of Questions :5]

SEAT No. :

**PE4214**

[Total No. of Pages : 2

**[6554]-3006**

**S.Y.M.C.A. (Management)**

**TAB612 MJ : TABLEAU**

**(2024 Pattern) (Semester-III)**

*Time : 2½ Hours]*

*[Max. Marks :50*

*Instructions to the candidates:*

- 1) *All questions are Compulsory.*
- 2) *Figure to the right indicate full marks.*
- 3) *Draw neat Diagram wherever necessary.*

**Q1) Solve any Two**

**[2×5=10]**

- a) Explain the role of data pivoting in Tableau and why it is useful for data preparation?
- b) What types of data sources can tableau connect to natively? Provide examples.
- c) Explain the how data blending differs from joins in Tableau, including scenarios where one might be preferred over the other with example?
- d) What are dimensions and measures in Tableau? Provide examples for each.

**Q2) Solve any two**

**[2×5=10]**

- a) Describe how data blending works in Tableau and why it is useful for combining data from multiple sources? Provide examples.
- b) Explain LOD expressions to calculate a custom metric (e.g., average sales per customer across regions) in a tableau worksheet, and describe the formula and expected output.
- c) Break down the process of cross-database joins in Tableau, identifying potential challenges and how data blending can mitigate them, with example.
- d) Compare data merging techniques (joins vs. unions) in Tableau, analyzing their strengths and weaknesses for different data scenarios.

**P.T.O.**

**Q3) Solve any two** **[2×5=10]**

- a) What are the key elements of a Tableau dashboard, and how do they contribute to data visualization?
- b) Describe the process of creating a heat map in Tableau and elaborate typical use cases.
- c) Design a dashboard layout for a Sales Performance Analysis using KPI indicators and Heat Maps. Explain the steps involved from worksheet creation to dashboard formatting.
- d) Critique a sample dashboard for its use of advanced visualizations does it effectively communicate KPIs, and what improvements would you suggest?

**Q4) Solve any two** **[2×5=10]**

- a) Explain the geospatial analytics in Tableau and list tools for creating custom territories.
- b) Describe time-based data analysis in Tableau, including functions for data hierarchies and calculations.
- c) Compare LOD expressions and table calculations in Tableau, analyzing their applications for different analytical needs.
- d) Explain the use of dynamic data filters for comparative time analysis in Tableau with example?

**Q5) Solve any two** **[2×5=10]**

- a) Explain the importance of user authentication and security in Tableau Server deployment.
- b) Evaluate the security features of Tableau Server, and how effective are they for protecting sensitive enterprise data?
- c) Explain the process of creating and managing groups and roles in Tableau Server.
- d) Describe the common TSM commands used for server configuration and management with example.



Total No. of Questions : 5]

SEAT No. :

**PE4215**

[Total No. of Pages : 3

**[6554]-3007**

**S.Y.M.C.A.**

**CMM 614 MJ : CLOUD MIGRATION & MANAGEMENT  
(2024 Pattern) (Semester - III)**

*Time : 2½ Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*

- Q1)** a) Discuss common risk in cloud migration & how to manage them? [5]  
b) List the key drivers for cloud migration and what are the main challenges faced in cloud migration? [5]

OR

- c) Explain significance of pre-migration planning & post - migration optimization. [5]  
d) Explain ROI assessment in cloud migration with example? [5]

- Q2)** a) What is the role of CI/CD pipeline in cloud migration? Discuss with best practices of the same. [5]  
b) A university plans to migrate its student information system (SIS) to the cloud to improve scalability, reduce cost and enhance collaboration. The SIS contains sensitive student data & the university needs to ensure the security and compliances of this data in the cloud. [5]

Questions :

- i) What cloud deployment model (public, private or hybrid) would you recommend for the SIS?
- ii) How would you ensure the secure and compliance of sensitive student data in the cloud?
- iii) What cloud migration strategy would you use to minimize disruption to student & faculty?

OR

**P.T.O.**

- c) Write a short note on SLA levels and their importance in cloud service delivery. [5]
- d) A global e-commerce company wants to migrate its services from on premise to multi-cloud (AWS + Azure) design a step by step migration plan ensuring zero downtime. [5]

- Q3)**
- a) Define cloud Governance and describe principles of cloud governance frameworks. [5]
  - b) Explain compliance and risk management in cloud governance. [5]

OR

- c) Academic institute operating 10 of its branches across the state, its planning to migrate its Electronic Employee Record (EER) system to the cloud. The institute network has concerns about ensuring the security and compliance of sensitive employee data, while also improving scalability and reducing costs. [10]

Questions :

As a cloud consultant design a cloud migration and governance strategy for the Institute network's EERs system, addressing the following requirements.

- i) Security and compliance
- ii) Scalability and performance
- iii) Cost optimization
- iv) Data Integration
- v) Governance framework

- Q4)**
- a) Compare the pricing model of AWS, Azure and GCP. [5]
  - b) List the troubleshooting technique and also explain incident management practices in cloud migration. [5]

OR

- c) Evaluate quality of service (QoS) parameters. [5]
- d) A start-up plans to migrate to the cloud but it is confused between AWS and GCP. Prepare a comparison based on pricing QoS and reliability.[5]

**Q5) a)** Describe the concept of serverless computing & its use in real time analytics. **[5]**

b) Explain the concept of Green cloud computing. Give Google cloud's carbon footprint examples. **[5]**

OR

c) Write short notes on (any two). **[5 each]**

i) AWS migration Hub

ii) Google migrate for compute engine

iii) Sustainability in cloud computing



Total No. of Questions : 5]

SEAT No. :

**PE4216**

[Total No. of Pages : 2

**[6554]-3008**

**S.Y.M.C.A. (Management)**

**DEL 616 MJ : DEEP LEARNING**

**(2024 Pattern) (Semester - III)**

*Time : 2½ Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*
- 3) *Use of scientific calculator is allowed.*

**Q1) Solve any two**

**[2×5=10]**

- a) Explain Deep learning with suitable example.
- b) What is Activation function? Explain Leaky ReLU with example.
- c) Explain the role of loss function & Discuss cross entropy loss with suitable example.
- d) What is Backpropagation? Explain its importance in training Artificial Neural Network.

**Q2) Solve any two**

**[2×5=10]**

- a) Consider the following input image matrix to be feed to CNN apply the convolution operation using given 2×2 Kernel (Stride = 2, No padding)

|   |   |   |   |   |
|---|---|---|---|---|
| 1 | 3 | 2 | 1 | 4 |
| 4 | 6 | 5 | 2 | 0 |
| 7 | 8 | 4 | 9 | 5 |
| 3 | 2 | 1 | 0 | 7 |
| 8 | 6 | 1 | 2 | 3 |

|   |   |
|---|---|
| 2 | 4 |
| 1 | 3 |

Kernel

Input image matrix - 5×5

- b) Describe VGG from CNN Architectures with suitable diagram.
- c) Illustrate and explain the working of the SSD object detection algorithm.
- d) Explain how VIT converts an image into a sequence of tokens.

**P.T.O.**

**Q3) Solve any two. [2×5=10]**

- a) Explain in detail architecture of a Recurrent Neural Network (RNN)
- b) Explain the architecture of a Gated Recurrent Unit (GRU) and discuss how it overcomes the limitations of traditional RNN.
- c) Demonstrate how Word2Vec and Glove capture semantic meaning of words through vector representation with suitable example.
- d) What is multimodal model? Explain CLIP with suitable example.

**Q4) Solve any two. [2×5=10]**

- a) Explain the architecture and working of GANs.
- b) Illustrate how to tune hyper parameters of a CNN using grid search.
- c) Describe the concept of Edge AI and enlist its advantages.
- d) Discuss the importance of AI regulations.

**Q5) Solve any one. [1×10=10]**

- a) Design and implement deep learning model using TensorFlow or PyTorch for classifying chest X-ray images into normal and abnormal cases indicating possible pneumonia. Describe the entire process including data set collection, data preprocessing, model architecture (such as CNN), Training and evaluation matrices. Justify your model.
- b) Explain the design and implementation of a CNN model to classify retinal fundus images into normal and abnormal categories for diabetic retinopathy detection. Describe the steps involved in data preprocessing, CNN layer selection, training process and performance evaluation using accuracy, precision recall and F1 - score. Justify your model.



Total No. of Questions : 5]

SEAT No. :

**PE4217**

[Total No. of Pages : 2

**[6554]-3009**

**S.Y.M.C.A. (Management)**

**EH 617 MJ : ETHICAL HACKING**

**(2024 Pattern) (Semester - III)**

*Time : 2½ Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*

**Q1) Solve any two. [10]**

- a) Explain different types of Hackers.
- b) Explain different phases of ethical Hacking.
- c) Describe how ethical hacking contributes in building customer trust.

**Q2) Solve any one. [10]**

- a) As an ethical hacker you are requested to perform following tasks to ensure the security of your organizational network with the details below. Write appropriate Nmap commands.
  - i) Identify running service & versions : [web server 192.168.1.50]
  - ii) Determine os type : [Host 192.168.1.60]
  - iii) Inventory hosts & versions: [subnet 192.168.1.0/24]
  - iv) Gather detailed service info : [Host 192.168.1.70]
  - v) Detect quietly to avoid IDS : [Sensitive host 192.168.1.80]
- b) With the exponential growth of internet of things (IoT) devices, understanding the exposure of connected systems has become increasingly critical. Shodan enables organizations and security researchers to gain visibility into their digital footprint, identify publicly accessible systems and assess potential security weakness before they can be exploited by malicious actors. To exploit the vulnerabilities you are requested to access following.
  - i) Identify all web servers in country
  - ii) Map exposed IP cameras
  - iii) Map remote access points
  - iv) Find vulnerable system in a city
  - v) Identify cloud servers

**P.T.O.**

**Q3) Solve any one. [10]**

- a) You are a penetration tester assigned to evaluate the security of a company's internal network. A report suggests that one of the machines on the network is running an outdated service known to have vulnerabilities. Your task is to gain access to the vulnerable machine using Metasploit. Make your own assumptions.
- b) You are tasked with assessing the security of a windows XP virtual machine on the internal network. The machine is running an outdated SMB service vulnerable to the M508-067 netapi vulnerability. Your goal is to gain a Meterpreter session using Metasploit. Follow all necessary steps and write necessary commands.

**Q4) Solve any two. [10]**

- a) Explain different types of web applications vulnerability.
- b) Write in detail about encryption, hashing and salting.
- c) Write down the steps to break ZIP files and PDF files with John the Ripper.

**Q5) Solve any two. [10]**

- a) Explain the major security challenges faced in internet of things (IoT) environments.
- b) Illustrate techniques used in vulnerability assessment and explain its importance in ethical hacking.
- c) Discuss in detail about wireless network security and vulnerabilities associated to it.



Total No. of Questions : 5]

SEAT No. :

**PE4218**

[Total No. of Pages : 2

**[6554]-3010**

**S.Y. M.C.A. (Management)**

**MSD 615 MJ : MERN STACK DEVELOPMENT**

**(2024 Pattern) (Semester - III) (Elective - V)**

**Time : 2½ Hours]**

**[Max. Marks : 50**

**Instructions to the candidates:**

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*
- 3) *Draw diagrams wherever necessary.*

**Q1) Solve any two**

**[10]**

- a) Implement a program using node js to handle asynchronous file operations using callbacks and promises.
- b) Create a basic HTTP server in Node js that serves static files and handles GET requests.
- c) Write a code example that creates a custom event emitter, triggers an event named 'data Received' and has a listener function that handles it.

**Q2) Solve any two**

**[10]**

- a) Perform CRUD operations on a "Students" collection. Write MongoDB queries to :
  - i) Insert a new student document
  - ii) Update the grade of a student named "Raju" and
  - iii) Delete all students who have graduated
- b) Design a complete MongoDB schema for a library management system with collections :
  - Books (title, author, ISBN, copies, genre)
  - Members (name, email, phone, membershipDate)
  - Transations (book Id, member Id, issuedate, returndate, status)

**P.T.O.**

Write queries to :

- i) Add new book, member and transaction
  - ii) Find all books borrowed by a member
  - iii) Find overdue books
- c) Compare and contrast SQL and NOSQL databases. Justify why MongoDB is a good fit for a MERN stack application with a specific example.

**Q3) Solve any two [10]**

- a) Write express. js code to create routes for /home, /about and /contact.
- b) Write an express app to handle GET and post requests.
- c) Illustrate how to connect express with MongoDB to serve REST APIs.

**Q4) Solve any one. [10]**

- a) What are React Hooks? Describe the purpose of the useState and useEffect hooks with examples.
- b) Why is Redux used in React? Differentiate between local state and Redux.

**Q5) Solve any one. [10]**

- a) Create a “To-Do List” application using the MERN stack express and MongoDB should be used a backend API and React for frontend development.
- b) Develop a Restful API using express. js and MongoDB for managing product catalog. Display the product list using react as a frontend.



Total No. of Questions : 5]

SEAT No. :

**PE4219**

[Total No. of Pages : 2

**[6554]-3011**

**S.Y. M.C.A. (Management)  
EC 619 MJ : E - COMMERCE  
(2024 Pattern) (Semester - III)**

*Time : 2½ Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) *Attempt all questions.*
- 2) *Figures to the right indicate full marks.*

- Q1)** a) Define E-business. Explain with suitable examples. [5]  
b) Explain how artificial intelligence and blockchain are transforming e-commerce. [5]

OR

- c) Explain M-Commerce for current digital world. [5]  
d) Explain G2B and B2G with suitable examples. [5]

- Q2)** a) Explain the basic structure and design principles of an E-Commerce website. [5]  
b) Explain the key factors to be considered while choosing on E-Commerce platform. [5]

OR

- c) Explain the challenges of payment gateways for E-Commerce players.[5]  
d) Explain the role of UX and UI design for online book store. [5]

- Q3)** a) Explain the role of SEO for improving e-commerce visibility. [5]  
b) Explain influencer marketing with examples from current e-commerce campaigns. [5]

OR

- c) Describe the importance of customer relationship management (CRM).[5]  
d) How can email marketing campaigns help to build customer loyalty? [5]

**P.T.O.**

**Q4) a)** BigBasket uses predictive data models to forecast customer demand and plan inventory. Discuss the importance of data analytics in ensuring customer satisfaction and operational efficiency in e-commerce. **[10]**

OR

b) Using predictive analytics, amazon forecasts which customers are likely to renew their prime subscription.  
Evaluate how predictive analytics and segmentation together support customer retention strategies. **[10]**

**Q5) Write a short on (any two).** **[10]**

- a) Protecting from online frauds.
- b) Data protection laws
- c) Fair trade practices in e-commerce
- d) SSL certificates



Total No. of Questions : 5]

SEAT No. :

**PE4220**

[Total No. of Pages : 2

**[6554]-3012**

**S.Y.M.C.A. (Management)**

**ERP 618 MJ : ENTERPRISE RESOURCE PLANNING**

**(2024 Pattern) (Semester - III)**

*Time : 2½ Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*

**Q1) a)** Explain how ERP systems integrate various business functions. **[5]**

b) Explain the different types of risks associated with ERP implementation. **[5]**

OR

c) Discuss how people and process issues can lead of ERP project failure. **[5]**

d) Define ERP. Explain various advantages of ERP. **[5]**

**Q2) a)** Differentiate between structured and unstructured DSS. **[5]**

b) Describe how the application of OLAP can be used to analyze sales performance across regions. **[5]**

OR

c) Describe the process involved in data warehousing. **[5]**

d) Discuss how PLCM enhances collaboration through ERP integration. **[5]**

**Q3) a)** MechTech Industries manufactures industrial machinery and has adopted the Production Planning and Control (PPC) module of ERP. Despite using the system, frequent production delays and raw material shortages occur. Work orders are often rescheduled, causing idle time and overtime expenses also the finished goods inventory fluctuates heavily.

Analyze the root causes of poor production planning and control and evaluate how ERP PPC functionalities like Material Requirements Planning and capacity planning can enhance production efficiency. **[10]**

OR

**P.T.O.**

- b) After integrating a new Finance and Accounting module, the CEO of Auto Prime Pvt. Ltd asks for a report summarizing Cash flow from operations. Which specific sub-module generates this report, and why is the data needed from other modules (like Accounts Receivable) to compile it?[10]

- Q4)** a) TechApexPvt. Ltd., decides to undergo extensive Business Process Reengineering (BPR) before selecting its ERP software. Why is performing BPR early in the Pre-Implementation phase beneficial, and what risk it poses if done later? [10]

OR

- b) As the ERP Project Manager of a manufacturing company, you observe that although the ERP system is technically implemented, challenges like poor user adoption, inconsistent data entry, and resistance to process changes are emerging. You realize that limited executive involvement and insufficient end - user training contributed to these issues. As the Project Manager, suggest the key steps you would take during the implementation phase to ensure strong executive commitment and effective end-user training, preventing post-implementation failures. [10]

- Q5)** Attempt any two from the following. [2×5=10]

- a) Describe how scalability is achieved in a cloud-based ERP environment.  
b) Describe how real-time IoT data feeds enhance ERP-based maintenance decisions.  
c) Short note on Robotic Process Automation.



Total No. of Questions : 5]

SEAT No. :

**PE4221**

[Total No. of Pages : 3

**[6554]-3013**

**S.Y. M.C.A. (Management)**

**IED 621 MJ : INNOVATION AND ENTREPRENEURSHIP**

**DEVELOPMENT**

**(2024 Pattern) (Semester - III)**

*Time : 2½ Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicate full marks.*

**Q1) Solve any two.**

**[2×5=10]**

- a) Explain the concept and importance of Innovation and Entrepreneurship.
- b) Differentiate between Innovation and Entrepreneurship with suitable examples.
- c) Describe the stages of the Innovation Process and various types of innovation in business.
- d) Explain any two Idea Generation Techniques and discuss the Lean Startup Methodology.

**Q2) Solve any two.**

**[2×5=10]**

- a) Explain the concept of the Business Model Canvas and its key components.
- b) Discuss the steps involved in preparing a Business Plan for a startup.
- c) Explain Strategic Planning and its importance for entrepreneurs.
- d) What is SWOT Analysis? Explain its use in business decision-making with an example.

**P.T.O.**

**Q3) Solve any two.**

**[2×5=10]**

- a) Discuss various sources of funding available for entrepreneurs.
- b) Explain the process of Financial Planning and Budgeting in startups.
- c) Describe the Valuation and Exit Strategies for new ventures.
- d) Explain the importance of Building a Strong Team and Organizational Structure for business growth.

**Q4) Solve any one.**

**[1×10=10]**

- a) Byju's pioneered digital learning in India, providing affordable education through innovative technology and interactive content. The company's mission was to bridge the educational gap between urban and rural students by using mobile-based learning, gamification, and regional language content. However, as Byju's expanded, it faced challenges such as maintaining content quality, ensuring internet access in rural areas, and managing a large teaching workforce.
  - i) Identify the key innovative practices adopted by Byju's.
  - ii) Discuss the entrepreneurial challenges faced during its growth and expansion.
  - iii) Suggest suitable strategies for sustainability and scalability of such digital ventures.
- b) Amul revolutionized India's dairy industry through a cooperative business model, enabling millions of rural farmers to gain financial independence. By introducing innovative milk collection, cold chain systems, and brand consistency, Amul turned rural production into a national success. However, with technological disruptions, changing consumer demands, and increasing competition from private brands, Amul must innovate again to maintain its leadership.
  - i) Highlight the innovative strategies that contributed to Amul's success.
  - ii) Analyze the challenges Amul faces in modern markets.
  - iii) Propose future innovation strategies for sustainable and competitive growth.

**Q5) Solve any two.**

**[2×5=10]**

- a) Explain the concept of Digital Transformation and its impact on entrepreneurship.
- b) Discuss the role of emerging technologies (AI, IoT, Blockchain, and Cloud Computing) in modern startups.
- c) Explain Sustainability and Technological Innovation with examples from Indian enterprises.
- d) Write short notes on Digital Marketing and IT Service Management for entrepreneurs.



Total No. of Questions : 5]

SEAT No. :

**PE4222**

[Total No. of Pages : 2

**[6554]-3014**

**S.Y.M.C.A. (Management )**

**SMM 620 MJ : SOCIAL MEDIA MARKETING**

**(2024 Pattern) (Semester - III)**

*Time : 2½ Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) All questions are compulsory.*
- 2) Figures to the right indicate full marks.*

**Q1) a)** Describe the scope of digital marketing with example of its application.[5]

b) Describe key challenges and legal issues in digital marketing. [5]

OR

c) Explain the concept of SEO and SEM with example. [5]

d) List and explain major type of digital marketing. [5]

**Q2) a)** What is importances of hastags in social media marketing explain with example. [5]

b) Describe the role of influencers in a social media marketing strategy. [5]

OR

c) What is ROI in social media marketing. Explain with example. [5]

d) Explain the importance of platform selection in digital marketing. [5]

**P.T.O.**

- Q3)** a) Explain the concept need and types of SEO in detail. [5]  
b) Explain the importance of meta tags and back links in improving website ranking. [5]

OR

- c) What are search engine algorithm and how do they affect website ranking. [5]  
d) Why is understanding the target audience importance for SOE strategy. [5]

- Q4)** a) Discuss different ways to engage and retain viewers on YouTube. [5]  
b) Explain importance of copywriting in digital marketing. [5]

OR

- c) Discuss the step involved in running instagram ad campaigns. [5]  
d) Explain the different types of content used in marketing. [5]

- Q5)** Write short note on (any two). [10]

- a) Whatsapp Marketing  
b) Plagiarism  
c) LinkedIn  
d) IT Act 2000

