PAPER ID-420132

Roll No: 2 0 0 0 0 5 0 0 6 0 0 5 4

MCAINT
(SEM IV) THEORY EXAMINATION 2021-22
COMPUTER BASED STATISTICAL TECHNIQUES

Time: 3 Hours ***Total Marks: 70***

Note: Attempt all Sections. If you require any missing data, then choose suitably.

SECTION A

1. Attempt *all* questions in brief. **2*7 = 14**

Q.no	Questions	Marks	CO
(a)	What do you understand by Interpolation?	2	2
(b)	What do you understand by Computer Based Statistical Techniques?	2	1
(c)	What do you understand by Difference tables?	2	2
(d)	What do you understand by Numbers and their accuracy?	2	1
(e)	What do you understand by Numerical Integration and Differentiation?	2	3
(f)	What do you understand by Solution of differential Equations?	2	4
(g)	Classify $u_{xx} + 3u_{xy} + u_{yy} = 0$	2	5

SECTION B

2. Attempt any *three* of the following: **7*3 = 21**

Q.no	Questions	Marks	CO
(a)	Explain finite difference method to the solution of Boundary value problem of second order.	7	5
(b)	Construct Newton forward interpolation polynomial for the data x: 4, 6, 8, 10 y: 1, 3, 8, 16 Hence evaluated y for x=5.	7	2
(c)	Explain about the concept and formulation of Trapezoidal rule.	7	3
(d)	Differentiate between ill conditioned and well-conditioned methods.	7	4
(e)	Briefly discuss about the Floating point representation of numbers.	7	1

SECTION C

3. Attempt any *one* part of the following: **7*1 = 7**

Q.no	Questions	Marks	CO
(a)	Explain about the Data fitting with Cubic splines under Statistical Computation.	7	5
(b)	Prove that $\Delta \log f(x) = \log\left[1 + \frac{\Delta f(x)}{f(x)}\right]$	7	2

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MCAINT
(SEM IV) THEORY EXAMINATION 2021-22
COMPUTER BASED STATISTICAL TECHNIQUES

4. Attempt any *one* part of the following: **7 *1 = 7**

Q.no	Questions	Marks	CO
(a)	Calculate $\sqrt{12}$ approximately using Newton-Raphson method.	7	1
(b)	Explain about the concept and formulation of Simpson's 1/3 and 3/8 rule.	7	3

5. Attempt any *one* part of the following: **7*1 = 7**

Q.no	Questions	Marks	CO
(a)	Discuss about the Curve fitting by method of least squares.	7	4
(b)	The velocity of a car which start initially from rest at interval of 2 minutes are given below Time (minutes): 2, 4, 6, 8, 10, 12 Velocity (Km/hr): 22, 30, 27, 18, 7, 0 Apply Simpson's 3/8th rule to find the distance covered by car.	7	5

6. Attempt any *one* part of the following: **7*1 = 7**

Q.no	Questions	Marks	CO
(a)	Using Regula Falsi Method find the real root of the equation $x^3 - 4x - 9 = 0$ Upto 3 iteration.	10	2
(b)	Discuss about the Errors. Describe the Muller's method.	10	1

7. Attempt any *one* part of the following: **7*1 = 7**

Q.no	Questions	Marks	CO
(a)	Find the value of the integral using trapezoidal rule, taking h=0.25 $\int_0^1 \frac{dx}{1+x^2}$	10	3
(b)	Find the value of y(1.1) using Runge-Kutta method of fourth order for the differential equation : $\frac{dy}{dx} = y^2 + xy, y(1) = 1.0$ Take h=0.05	10	4

Subject Code: RCAI402

PAPER ID-420685

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MCAINT
(SEM IV) THEORY EXAMINATION 2021-22
DATA STRUCTURES USING C

Time: 3 Hours *Total Marks: 70*

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. **2 x 7 = 14**

a.	Explain Generalized linked list.
b.	Give some applications of stack.
c.	How to represent a graph in memory?
d.	Explain threaded binary tree.
e.	Explain Tail recursion.
f.	What do you understand by time and space trade off?
g.	How can you represent a sparse matrix in memory?

SECTION B

2. Attempt any *three* of the following: **7 x 3 = 21**

a.	What is data structure? Explain the types of data structure in detail.
b.	What is Huffman tree? Create a Huffman tree and generate Huffman code for the following: A:25 B:56 C:14 D:68 E:89 F:37 G:18 H:62 I:25 J:77
c.	Transform the following expression into its equivalent postfix expression using stack: A + (B * C - (D / E ↑ F) * G) * H
d.	Define the various asymptotic notations in detail.
e.	Write a program to find an element using binary search in 'C' language.

SECTION C

3. Attempt any *one* part of the following: **7 x 1 = 7**

(a)	Explain how an element can be deleted from a specific location in doubly linked list using C function.
(b)	Define Hashing. Explain various methods of collision resolution.

4. Attempt any *one* part of the following: **7 x 1 = 7**

(a)	What is Binary Search Tree (BST)? Construct a BST for a given sequence of numbers: 35, 24, 68, 46, 13, 55, 88, 44, 99, 76, 85, 94, 32.
(b)	Describe all rotations in AVL tree. Constructed a AVL tree from the following nodes: B, C, G, E, F, D, A

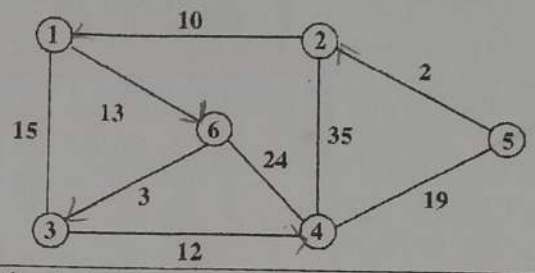
5. Attempt any *one* part of the following: **7 x 1 = 7**

(a)	Double linked list takes more space than single linked list for storing one extra address. Under what condition, could a double linked list more beneficial than single linked list? Explain in detail.
(b)	What is min heap? Create the min heap for the following data set: 7, 16, 51, 4, 34, 46, 41, 81, 11

6. **Attempt any *one* part of the following:** 7 x 1 = 7

(a)	Using the following traversals construct the corresponding binary tree: INORDER: H K D B I L E A F C M J G PREORDER: A B D H K E I L C F G J M
(b)	Explain sequential file organization. Differentiate between sequential file and index sequential file.

7. **Attempt any *one* part of the following:** 7 x 1 = 7

(a)	Find the minimum cost spanning tree for the following graph using Prim's algorithm. 
(b)	Write DFS algorithm to traverse a graph.

A

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Subject Code: RCAI403

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MCAINT
(SEM IV) THEORY EXAMINATION 2021-22
FUNDAMENTALS OF E-COMMERCE

Time: 3 Hours *Total Marks: 70*

Note: Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. **2*7 = 14**

a.	Describe the meaning of Business.
b.	Explain the purpose of doing commercial activities.
c.	Describe the support available through modern technologies for commercial activities.
d.	Justify the need of e-commerce for modern days.
e.	Explain the way in which education sector is supported by e-commerce.
f.	Describe the need of having websites.
g.	Describe the need of encryption in commercial activities.

SECTION B

2. Attempt any *three* of the following: **7*3 = 21**

a.	Describe the driving forces for e-commerce with applicable examples.
b.	Explain the way in which we are facing difficulties because of e-commerce.
c.	Explain the architectural framework for electronic commerce.
d.	Explain the necessity of web technologies for making the commerce effective.
e.	Explain the way in which firewall is playing its role in making the network secure for doing the commerce.

SECTION C

3. Attempt any *one* part of the following: **7*1 = 7**

a.	Explain the way in which e-commerce has changed the entire business scenario for business houses with required example.
b.	Explain the future scope of e-commerce while explaining the current and past business practices.

4. Attempt any *one* part of the following: **7*1 = 7**

a.	Explain WAP protocol stack while considering its use.
b.	Explain the role of WAP in mobile computing or mobile commerce.

5. Attempt any *one* part of the following: **7*1 = 7**

a.	Explain the way in which fixed and mobile networks makes the difference in commercial world.
b.	Describe the advantages and disadvantages of mobile network for e-commerce.

6. Attempt any *one* part of the following: **7*1 = 7**

a.	Justify the need of data security in e-commerce while considering different issues related to security.
b.	Explain the different types of firewalls which may get used in commercial networks.

7. Attempt any *one* part of the following: **7*1 = 7**

a.	Describe SET and SSL based transactions while differentiating both.
b.	Describe the followings: i) Payment Gateway ii) Digital Token iii) Digital Signature

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Subject Code: RCAI404

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MCAINT
(SEM IV) THEORY EXAMINATION 2021-22
PRINCIPLES OF MANAGEMENT

Time: 3 Hours *Total Marks: 70*

Note: Attempt all Sections. If you require any missing data, then choose suitably.

SECTION A

1. Attempt *all* questions in brief. **2*7 = 14**

Q.no	Questions	Marks	CO
(a)	What do you understand by Principles of Management?	2	1
(b)	What do you understand by Nature of Management?	2	1
(c)	Discuss the need Management Planning?	2	2
(d)	Discuss the need ofAuthority & Responsibility.	2	2
(e)	What do you understand by Staffing?	2	3
(f)	What do you understand by Leadership?	2	4
(g)	Discuss the need Controlling.	2	5

SECTION B

2. Attempt any *three* of the following: **7*3 = 21**

Q.no	Questions	Marks	CO
(a)	Explain Types of Control and about Developing a Quality Control System.	10	5
(b)	What are the Types of Planning? What are the Objectives and Significance of Planning?	10	2
(c)	Explain about the concept Manpower Planning. What do you understand by Recruitment and Selection?	10	3
(d)	What are the Functions of Leaders? Discuss Leadership Style.	10	4
(e)	Briefly discuss about the concept of Management As a Profession. List the Management Skills.	10	1

SECTION C

3. Attempt any *one* part of the following: **7*1 = 7**

Q.no	Questions	Marks	CO
(a)	Explain about the Barriers to Effective Planning. Discuss Organization Theories.	10	2
(b)	Discuss about the following. (i) Total Quality Control (ii) Pre-control of Inputs	10	5

4. Attempt any *one* part of the following: **7 *1 = 7**

Q.no	Questions	Marks	CO
(a)	What are the Levels of Management? Discuss Fayol's Administrative Management.	10	1
(b)	Discuss about the following. (i) Performance Appraisal (ii) Motivation and Performance	10	3

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MCAINT
(SEM IV) THEORY EXAMINATION 2021-22
PRINCIPLES OF MANAGEMENT

5. Attempt any *one* part of the following: 7*1 = 7

Q.no	Questions	Marks	CO
(a)	Discuss about the Concurrent Control of Operations.	10	5
(b)	Discuss about the following. (i) Communication Process (ii) Importance of Communication	10	4

6. Attempt any *one* part of the following: 7*1 = 7

Q.no	Questions	Marks	CO
(a)	Discuss about the following. (i) Forms of Organizational Structure (ii) Delegation of Authority	10	2
(b)	Discuss about the following. (i) Bureaucracy (ii) Social System Approach	10	1

7. Attempt any *one* part of the following: 7*1 = 7

Q.no	Questions	Marks	CO
(a)	What are the Approaches for Improving Motivation? Discuss about the Quality of Work Life.	10	3
(b)	Discuss about the following. (i) Communication Channels (ii) Business Ethics and Social Responsibility	10	4

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MCAINT
(SEM IV) THEORY EXAMINATION 2021-22
OPERATING SYSTEMS

Time: 3 Hours ***Total Marks: 70***

Note: Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. **2*7 = 14**

a.	What is information in the PCB? Discuss it with diagram
b.	Discuss the main purpose of system calls and system programs.
c.	What are Binary Semaphores?
d.	What is dispatcher?
e.	Define seek time and latency time.
f.	How Hit ratio can be calculated?
g.	How can we avoid deadlocks to occur?

SECTION B

2. Attempt any *three* of the following: **7*3 = 21**

a.	Explain operating system. Discuss the various functions of an operating system.
b.	Consider the following process: **Process** / **Arrival Time** / **Burst Time** P1 / 0 / 8 P2 / 1 / 4 P3 / 2 / 9 P4 / 3 / 5 What is the average waiting and turnaround time for this process with (i) FCFS Scheduling (ii) Preemptive SJF Scheduling?
c.	How virtual memory can be implemented? Discuss.
d.	Discuss File allocation methods used in operating system.
e.	Define graceful degradation?

SECTION C

3. Attempt any *one* part of the following: **7*1 = 7**

a.	Differentiate between Hard and Soft real time operating systems.
b.	What is CPU bound and I/O bound processes?

4. Attempt any *one* part of the following: **7*1 = 7**

a.	What do you understand by a Process? Discuss process state transition diagram.
b.	What is Producer Consumer problem? How it can illustrate the classical Problem of synchronization? Explain

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MCAINT
(SEM IV) THEORY EXAMINATION 2021-22
OPERATING SYSTEMS

5. Attempt any *one* part of the following: **7*1 = 7**

a. Suppose we have five processes and three resources, A, B, and C. A has 10 Instances, B has 5 instances and C has 7 instances. Can the system execute the Following processes without deadlock occurring, if yes find safe sequence?

Process	Allocation			Maximum		
	A	B	C	A	B	C
P1	0	1	0	7	5	3
P2	2	0	0	3	2	2
P3	3	0	2	9	0	2
P4	2	1	1	2	2	2
P5	0	0	2	4	3	3

b. Explain the concept of segmentation with proper diagram

6. Attempt any *one* part of the following: **7*1 = 7**

a. Define SCAN and C-SCAN scheduling algorithms.

b. Illustrate the page-replacement algorithms use the reference string 7, 0,1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2,1, 2, 0, 1, 7, 0,1 for a memory with three frames, by using following algorithms.
   a) FIFO
   b) Optimal page replacement

7. Attempt any *one* part of the following: **7*1 = 7**

a. Discuss the Unix directory structure with proper diagram.

b. Explain the difference between External fragmentation and Internal Fragmentation. How one can solve the fragmentation problem using paging.