Hall Ticket No: | | | | | | | | | | | Question Paper Code: 22MATP101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

MCA I Year I Semester (R22) Regular & Supplementary End Semester Examinations, April - 2024

MATHEMATICAL FOUNDATIONS FOR COMPUTER APPLICATIONS

Time: 3Hrs **Max Marks: 60**

Attempt all the questions. All parts of the question must be answered in one place only.
In Q.No 1 to 5 answer either A or B only

Q.No	Question	Marks	CO	BL
Q.1(A)	a) Show that ¬(P→Q) and P∧¬ Q are logically equivalent. b) (P→Q) ↔(¬P∨Q) is the Tautology.	12M	1	2
	OR			
Q.1(B)	If A works hard then either B or C enjoy them, If B enjoys himself, then A will not work hard. If D enjoy himself then C not enjoy. Therefore, If A works hard then D will not enjoy himself.	12M	1	3
Q.2(A)	a) P= {1,2,3,4,6,12} x divides y. Prove the above set is POSET or not and Draw Hasse diagram if it is POSET.	12M	2	3
	b) How to represent the relations explain with example.			2
	OR			
Q.2(B)	(a) Which elements of POSET {2, 4, 5, 10, 12, 20, 25} are maximal and minimal.	12M	2	2
	(b) Explain the properties of relations.			2
Q.3(A)	Define Directed graph, undirected graph, weighted graph, multigraph with example and its representations.	12M	3	2
	OR			
Q.3(B)	a) What is graph coloring? Explain with example b). What is tree? Explain all the tree terminologies with tree traversal.	12M	3	3 3
Q.4(A)	Explain the following data visualization graphs with suitable example. Histograms b) Ogives c)Percentiles d) Box-Plot	12M	4	3
	OR			
Q.4(B)	From the given data calculate the regression equation Y on X	12M	4	2

X	1	3	5	7	9	4	6
Y	2	4	3	7	5	6	1

Q.5(A) a) Consider the following table: 12M 5 3

Gender	Right handed	Left handed	Total
Male	0.41	0.08	0.49
Female	0.45	0.06	0.51
Total	0.86	0.14	1

Find the Probability

a) A male given that he is right handed.
b) Right handed given that he is male.
c) Female given that she is left handed.
d) All the events begin a female and being left-handed justify.

b) If X has Poisson Distribution with parameter m=3 with

3

P[X=2] ii. P[X<=3]. (e^{-3} =0.0437)

OR

Q.5(B)	X is normally distributed variable with mean 30 and standard deviation 4 find the probability. a)P(X<40) b)P(X>21) c) P(15<X<35).	12M	5	3

***** END*****

Hall Ticket No: | | | | | | | | | | |

Question Paper Code: 22MCAP101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

MCA I Year I Semester (R22) Regular & Supplementary End Semester Examinations, April - 2024

PYTHON PROGRAMMING

Time: 3Hrs **Max Marks: 60**

Attempt all the questions. All parts of the question must be answered in one place only.
In Q.No 1 to 5 answer either A or B only

Q.No	Question	Marks	CO	BL
Q.1(A)	Distinguish between global, local and non-local variables with proper examples.	12M	1	4
	OR			
Q.1(B)	Explain about the Control statements and Loop statements available in python with examples.	12M	1	3
Q.2(A)	What are the different types of functions? Explain with examples.	12M	2	2
	OR			
Q.2(B)	i. What is meant by Lambda function, explain with examples?	6M	2	2
	ii. Explain recursive functions with suitable examples.	6M	2	2
Q.3(A)	Explain the tuple operations and function with examples	12M	3	4
	OR			
Q.3(B)	Illustrate the slicing and indexing operations of List datatype with examples.	12M	3	3
Q.4(A)	Describe the list comprehensions using for, for with if and for with if else.	12M	4	2
	OR			
Q.4(B)	a. Explain about dictionary comprehensions with if	6M	4	2
	b. Write a program to illustrate about the file position.	6M	4	4
Q.5(A)	Define Exception? Explain how the exceptions can be handled in python with suitable examples.	12M	5	2
	OR			
Q.5(B)	What is inheritance? Explain the various types of inheritances with examples.	12M	5	2

***** END*****

Hall Ticket No: | | | | | | | | | | |

Question Paper Code: 22MCAP102

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

MCA I Year I Semester (R22) Regular & Supplementary End Semester Examinations, April - 2024

DATABASE MANAGEMENT SYSTEMS

Time: 3Hrs **Max Marks: 60**

Attempt all the questions. All parts of the question must be answered in one place only.
In Q.No 1 to 5 answer either A or B only

Q.No	Question	Marks	CO	BL
Q.1(A)	Explain the architecture of DBMS.	12M	1	2
	OR			
Q.1(B)	(i) Explain database system Vs file system. (ii) Difference between instances and schemas.	6M 6M	1	2
Q.2(A)	Explain set operations with examples.	12M	2	3
	OR			
Q.2(B)	Create a student database for minimum of 10 students and calculate the average CGPA for all students by implementing DDL and DML queries.	12 M	2	4
Q.3(A)	Explain the following with an example: (i) Lossy decomposition (ii) Lossless decomposition	12M	3	2
	OR			
Q.3(B)	Explain Third Normal Form and Fourth Normal Form with examples.	12M	3	3
Q.4(A)	(i) Explain about ACID properties of a transaction. (ii) Discuss in detail about serializability.	6M 6M	4	2
	OR			
Q.4(B)	Explain about concurrency control schemes.	12M	4	2
Q.5(A)	Demonstrate implicit and explicit Exceptions in PL / SQL	12M	5	3
	OR			
Q.5(B)	Explain Triggers and cursors with Example.	12M	5	3

***** END*****

Hall Ticket No: | | | | | | | | | | | Question Paper Code: 22MCAP103

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

MCA I Year I Semester (R22) Regular & Supplementary End Semester Examinations, April - 2024

COMPUTER ORGANIZATION AND ARCHITECTURE

Time: 3Hrs **Max Marks: 60**

Attempt all the questions. All parts of the question must be answered in one place only.
In Q.No 1 to 5 answer either A or B only

Q.No	Question	Marks	CO	BL
Q.1(A)	Explain the operation of logic gates and provide examples of their use in digital circuits.	12M	1	2
	OR			
Q.1(B)	Explain the working principle of flip-flops. Explain the working various types of flip-flops and their applications.	12M	1	2
Q.2(A)	Explain the concept of addressing modes in CPU architecture and provide examples of different addressing modes.	12M	2	3
	OR			
Q.2(B)	Differentiate between hardwired control and microprogrammed control in CPU design, discussing their respective advantages and disadvantages.	12M	2	2
Q.3(A)	Describe the role of data path and control considerations in the design of CPU pipelines, focusing on their impact on performance and efficiency.	12M	3	4
	OR			
Q.3(B)	Explain the concept of exception handling in CPU pipelines and discuss its importance in ensuring system reliability and stability.	12M	3	3
Q.4(A)	Define the concept of memory hierarchy in computer systems and its significance in terms of performance and cost.	12M	4	3
	OR			
Q.4(B)	Describe the characteristics and operation of secondary storage devices, such as hard disk drives and solid-state drives.	12M	4	3
Q.5(A)	Illustrate the concept of priority interrupts and how they are handled in a computer system, considering their impact on system responsiveness and efficiency.	12M	5	3
	OR			
Q.5(B)	Explain the concepts of inter-process communication and synchronization in multiprocessor systems, including techniques such as message passing and shared memory, and discuss the challenges of maintaining cache coherence in a multi-core environment.	12M	5	4

***** END*****

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Question Paper Code: 22MCAP104

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

MCA I Year I Semester (R22) Regular & Supplementary End Semester Examinations, April - 2024

OPERATING SYSTEMS

Time: 3Hrs **Max Marks: 60**

Attempt all the questions. All parts of the question must be answered in one place only.
In Q.No 1 to 5 answer either A or B only

Q.No	Question	Marks	CO	BL
Q.1(A)	Explain the various services & Functions of operating system.	12M	1	3
	OR			
Q.1(B)	Discuss the Inter process communication with neat diagram.	12M	1	4
Q.2(A)	(i) Explain the necessary conditions for Deadlock occurrence. (ii) Write about the methods for handling Deadlocks.	6M 6M	2	3 2
	OR			
Q.2(B)	What is paging? Explain in detail with a neat diagram.	12M	2	3
Q.3(A)	What is a Critical Section problem? Explain different satisfactory conditions in detail.	12M	3	2
	OR			
Q.3(B)	Explain Round Robin CPU Scheduling algorithm with an example.	12M	3	3
Q.4(A)	Consider the following page reference string 2,3,4,5,3,2,6,7,3,2,3,4,1,7,1,4,3,2,3,4,7. Calculate the number of page faults with LRU, FIFO and optimal page replacement algorithms with frame size of 3.	12M	4	4
	OR			
Q.4(B)	What is Virtual Memory? Discuss the Demand Paging Implementation with a neat diagram.	12M	4	2
Q.5(A)	Describe the services provided by Kernel I/O Subsystem in detail.	12M	5	3
	OR			
Q.5(B)	Explain various Disk scheduling algorithms.	12M	5	4

***** END*****

Hall Ticket No: | | | | | | | | | | |

Question Paper Code: 22MCAP105

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

MCA I Year I Semester (R22) Regular & Supplementary End Semester Examinations, April - 2024

COMPUTER NETWORKS

Time: 3Hrs **Max Marks: 60**

Attempt all the questions. All parts of the question must be answered in one place only.
In Q.No 1 to 5 answer either A or B only

Q.No	Question	Marks	CO	BL
Q.1(A)	Explain in detail about each layer functions of TCP/IP model layered architecture with neat diagram.	12M	1	2
	OR			
Q.1(B)	List and explain the advantages and drawbacks of various types of topology.	12M	1	3
Q.2(A)	Explain about sliding window protocols with their advantages and disadvantages.	12M	2	2
	OR			
Q.2(B)	A series of 8-bit message blocks 11100110 transmitted across a data link using CRC for error detection. A generator polynomial X4+X3+1 is to be used. Illustrate the following: (i)CRC Generation Process (ii) CRC Checking process	12M	2	4
Q.3(A)	Compare and distinguish in detail the concept of Virtual-circuit and Datagram Networks.	12M	3	4
	OR			
Q.3(B)	State the major differences between distance vector routing and link state routing Protocols	12M	3	4
Q.4(A)	Give the format of TCP header and discuss the relevance of various Fields.	12M	4	2
	OR			
Q.4(B)	Explain the method congestion? Write a short note on how to control congestion in TCP?	12M	4	2
Q.5(A)	What is DNS? What resource records are associated with it?	12M	5	2
	OR			
Q.5(B)	With neat sketch, explain the steps of Data Encryption Standard to encrypt plain text to cipher text.	12M	5	2

***** END*****