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

Question Paper Code: 22MCAP101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

MCA I Year I Semester (R22) Regular End Semester Examinations, March - 2023

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 $\neg(P\rightarrow Q)$ and $P\wedge\neg Q$ are logically equivalent.	6M	1	1
	b) $(P\rightarrow Q)\leftrightarrow(\neg P\vee Q)$ is the Tautology.	6M	1	1
	OR			
Q.1(B)	If there was a ball game, then travelling was difficult, if they arrived on time, then travelling was not difficult they arrived on time, therefore there was no ball game.	12M	1	3
Q.2(A)	(a)Explain about total ordering relation with example.	6M	2	3
	b) Check the given Relation R is Equivalence relation or not. X= {1,2,3,4,5,6} R = { (1,1) (1,3),(1,5),(3,5),(3.3), (5,5),(2,6),(2,2),(6.6),(6,2),(3.1),(5,1),(5,3)(4,4)}.	6M	2	2
	OR			
Q.2(B)	(a)Draw the Hasse diagram for the divisibility on the set S {2,3,5,10,11,15,25}	6M	2	1
	(b)Define the properties of a lattice.	6M	2	2
Q.3(A)	Define Walk, Closedwalk, and Trail and Closed trail with examples.	12M	3	3
	OR			
Q.3(B)	a) What is graph coloring? Explain with example	6M	3	3
	b).What is tree? Explain all the tree terminologies.	6M	3	3
Q.4(A)	The scores of two batsmen 'A' and 'B' in 10 innings are as follows:	12M	4	3

A:	32	28	47	63	71	39	10	60	96	14	100	67
B :	19	31	48	53	67	90	10	62	40	80	102	77

Which batsman is considered as more consistent?

	OR									
Q.4(B)	(i) Write about Correlation for a bi-variate distribution.	4M	4	2						
	(ii) Calculate the rank correlation coefficient for the following data:	8M	4	3						

X	68	64	75	50	64	80	75	40	55	64
Y	62	58	68	45	81	60	68	48	50	70

Q.5(A)	(i) A computer center has three printers A, B, and C, which print at different speeds. Programs are routed to the first available printer. The probability that a program is routed to printers A, B and C are 0.6, 0.3 and 0.1 respectively. Occasionally a printer will jam and destroy the printout. The probability that printers A, B and C will jam are 0.01, 0.05 and 0.04 respectively. Your program is destroyed when a printer jams. What is the probability that printer A is involved? Printer B involved? Printer C involved?	8M	5	4
	(ii)Let density for X , the number of grafts that fail in a series of five trials, is given the following table:	4M	5	3

x	0	1	2	3	4	5
$f(x)$	0.7	0.2	0.05	0.03	0.01	$f(5)$

(a) Find $f(5)$? (b) Find the table for $P(1 < X \leq 4)$?

OR

Q.5(B)	If X has Poisson Distribution with parameter '*m*' with P[X=2]=P[X=3]. (e^{-3} =0.0437)	4M	5	3
	(ii) If X is normally distributed with mean 1 and variance 4, find (a) $p(X < 3)$ (b) $p(1 < X < 3)$ (C) $p(X > 2)$.	8M	5	3

***** END*****

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MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

MCA I Year I Semester (R22) Regular End Semester Examinations, March - 2023

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)	Explain about type conversion functions with examples.	12M	1	3
	OR			
Q.1(B)	Explain about the Control statements and Loop statements available in python with examples.	12M	1	3
Q.2(A)	Develop Python scripts for the following using User Defined Functions			
	(i). To check the given number is Prime or not	6M	2	4
	(ii). To check the given number is odd or even	6M	2	4
	OR			
Q.2(B)	List and explain the different types of UDFs with examples	12M	2	3
Q.3(A)	Explain the tuple operations and functions with examples.	12M	3	2
	OR			
Q.3(B)	Illustrate the slicing and indexing operations of List data type with examples.	12M	3	2
Q.4(A)	Illustrate the various list comprehensions with suitable examples	12M	4	2
	OR			
Q.4(B)	Explain the file methods in Python with examples	12M	4	2
Q.5(A)	How will you handle the following, explain with examples			
	(i) Single exception	6M	5	2
	(ii) Multiple exceptions	6M	5	2
	OR			
Q.5(B)	Write short notes on OOPS in Python.	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 End Semester Examinations, March - 2023

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)	Draw ER diagram for Hospital Management System (Use DOCTOR, PATIENT, HOSPITAL and MEDICAL_RECORD Entity). Identify Primary Key and Foreign Key.	12M	1	4
	OR			
Q.1(B)	Draw and explain the detailed system architecture of DBMS.	12M	1	3
Q.2(A)	Write SQL query for following consider table EMP(empno , deptno, ename, salary, Designation, joiningdate, DOB, city) i) Display names of employees whose experience is more than 10 years ii) Display age of employees iii) Display average salary of all employee.	12M	2	4
	OR			
Q.2(B)	Explain in detail about Various types of Integrity constraints.	12M	2	2
Q.3(A)	Illustrate the process of 1NF, 2NF & 3NF with examples.	12M	3	2
	OR			
Q.3(B)	Illustrate the functioning of Lossydecomposition, Lossless-join Decomposition,	12M	3	3
Q.4(A)	Explain ACID properties of transaction and Conflict serializability.	12M	4	2
	OR			
Q.4(B)	Summarize the process of Two Phase Locking protocol and how does it guarantee serializability	12M	4	3
Q.5(A)	Write a PL/SQL program to check whether specified employee is present in EMP table or not. Accept empno from user. If employee does not existdisplay message using exception handling.	12M	5	4
	OR			
Q.5(B)	Discuss Triggers and cursors with Example.	12M	5	2

***** END*****

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MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

MCAI Year I Semester (R22) Regular End Semester Examinations, March - 2023

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 combinational and sequential circuits in detail	12M	1	2
	OR			
Q.1(B)	Discuss about Jk and SR fillip flop function with neat diagram	12M	1	3
Q.2(A)	What is bus? Explain the bus architecture with neat diagram.	12M	2	2
	OR			
Q.2(B)	What is RISC and CISC and explain with examples	12M	2	2
Q.3(A)	What is Hazard? Explain how the hazards are influence on the following a. Instruction set b. Data path	12M	3	2
	OR			
Q.3(B)	Explain different types of hazards and their influence at time of exception handling.	12M	3	2
Q.4(A)	Differentiate the following with its characteristics. a. SRAM- DRAM b. RAM – ROM	12M	4	4
	OR			
Q.4(B)	Explain the cache memory and related mapping techniques.	12M	4	2
Q.5(A)	What is I/O controller and explain Synchronous vs Asynchronous I/O	12M	5	4
	OR			
Q.5(B)	What is multiprocessing? Explain its characteristics.	12M	5	2

***** END*****

Hall Ticket No: | | | | | | | | | | | Question Paper Code: 22MCAP104

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

MCA I Year I Semester (R22) Regular End Semester Examinations, March - 2023

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)	What is operating system? Explain the functions and services of operating system.	12M	1	1
	OR			
Q.1(B)	Consider the following data with burst time given in milliseconds: process Burst time Priority p1 7 3 p2 1 1 p3 2 3 p4 3 4 p5 5 2 The process has arrived in the order p1, p2, p3, p4, p5 all at time 0. a. Draw Gantt charts for the execution of these processes using FCFS, SJF, a non-preemptive priority and RR (quantum=1) scheduling. b. What is the turnaround time and waiting time of each process for each of the scheduling algorithm?	12M	1	3
Q.2(A)	Explain different types of process scheduling algorithms with example.	12M	2	2
	OR			
Q.2(B)	i. Describe necessary conditions for a deadlock situation to arise.	6M	2	2
	ii. b. Explain the methods for deadlock prevention	6M	2	2
Q.3(A)	Explain the following:			
	i. Multi-processor scheduling	6M	3	2
	ii. Real time scheduling	6M	3	2
	OR			
Q.3(B)	What is Virtual Memory? Discuss the Demand Paging implementation with neat diagram.	12M	3	2
Q.4(A)	Explain various disk scheduling algorithms.	12M	4	2
	OR			
Q.4(B)	Explain in detail about the following:			
	i. File Sharing	6M	4	2
	ii. File Protection	6M	4	2
Q.5(A)	Explain in detail about the following:			
	i. Free-space management	6M	5	2
	ii. Swap-space management	6M	5	2

OR

Q.5(B)	Explain in detail about the following:			
	i. File System Structure	6M	5	2
	ii. File System Implementation	6M	5	2

***** END*****

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MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

MCA I Year I Semester (R22) Regular End Semester Examinations, March - 2023

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)	Define computer networks? Describe various types of networks topologies in computer network. Also discuss various advantages and disadvantages of each topology.	12M	1	2
	OR			
Q.1(B)	List out and explain the applications of Computer Networks?	12M	1	2
Q.2(A)	How performance is improved in CSMA/CD protocol compared to CSMA?	12M	2	2
	OR			
Q.2(B)	Do we need a multiple access protocol when we use the local loop of the telephone company to access the internet? Explain.	12M	2	3
Q.3(A)	List the fields of an IPv4 datagram header that participate in fragmentation and reassembly?	12M	3	3
	OR			
Q.3(B)	Explain the Distance Vector Routing with Example?	12M	3	2
Q.4(A)	Illustrate data units at different layers of the TCP / IP protocol suite?	12M	4	4
	OR			
Q.4(B)	Explain the method congestion? Write a note on how to control congestion?	12M	4	2
Q.5(A)	Explain RSA algorithm with Example?	12M	5	2
	OR			
Q.5(B)	Explain briefly WWW with its applications?	12M	5	2

***** END*****