MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
MCA I Year II Semester (R20) Regular End Semester Examinations – November 2021
JAVA 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 Part A or Part B only.

Q.No	Question	Marks	CO	BL
Q.1(A)	Explain the different primitive data types in Java with suitable examples.	12M	1	1
	OR			
Q.1(B)	How will you handle multi-dimensional arrays? Explain with suitable examples.	12M	1	2
Q.2(A)	Discuss the different types of Inheritances with suitable examples.	12M	2	2
	OR			
Q.2(B)	Write the benefits of packages and interfaces.	6M	2	1
	How can we add a class to a package? Write about relative and absolute paths.	6M	2	2
Q.3(A)	Write a Java program to read a file (using character stream).	6M	3	3
	Explain serialization in relation with stream class.	6M	3	2
	OR			
Q.3(B)	Differentiate Input / Output Basics and streams.	12M	3	2
Q.4(A)	What is Exception? Give different types of exception that could occur during runtime. Why to handle exception?	12M	4	2
	OR			
Q.4(B)	Discuss about checked and unchecked exceptions with examples.	12M	4	3
Q.5(A)	What are JFrame, JApplet and JDialog? Explain with suitable examples.	12M	5	2
	OR			
Q.5(B)	What are helper classes? Discuss with suitable examples.	12M	5	2

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
MCA I Year II Semester (R20) Regular End Semester Examinations – November 2021
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 2 to 6 answer either A or B only

Q.No	Question	Marks	CO	BL
Q.1(A)	Explain the architecture of Database system.	12M	1	2
	OR			
Q.1(B)	Explain the different components in ER Diagram. Draw the ER diagram for Hospital Management system.	12M	1	2
Q.2(A)	Explain the date, aggregate, character and string functions in SQL.	12M	2	3
	OR			
Q.2(B)	Explain the different type of integrity constraints with an example.	12M	2	3
Q.3(A)	When a relation is said to be in 1 NF, 2 NF, 3 NF and BCNF? Give an example for each of the NF.	12M	3	4
	OR			
Q.3(B)	a) Explain functional dependency and fully functional dependency with examples. b) When a relation is said to be in 5NF?.	6M + 6M	3	4
Q.4(A)	Write shore notes on database recovery techniques.	6 + 6	4	2
	OR			
Q.4(B)	Explain the timestamp based protocol for concurrency control.	12M	4	2
Q.5(A)	What is cursor? Explain the cursor concept with own example.	12M	5	4
	OR			
Q.5(B)	Write short notes on document and graph database.	12M	5	4

*** END***

Hall Ticket No: ☐☐☐☐☐☐☐☐☐☐ Question Paper Code: 20MCAP108

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
MCA I Year II Semester (R20) Regular End Semester Examinations – November 2021
DATA STRUCTURES AND ALGORITHMS

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)	i. What is an algorithm? Discuss the characteristics of algorithm.	6M	1	1
	ii. Write an algorithm to insert and delete an element from a simple queue	6M		3
	OR			
Q.1(B)	Differentiate between single linked list and doubly linked list.	12M	1	4
Q.2(A)	Write a program to implement Selection sort and calculate its complexity with example.	12M	2	2
	OR			
Q.2(B)	i. Derive a best ,worst and best case complexity of linear search		2	6
	ii. Write a program to implement bubble sort and calculate its time complexity	6M 6M		2
Q.3(A)	Construct Binary search tree for the following elements: 47, 12, 75, 88, 90, 73, 57, 1, 85, 50, 62.	12M	3	5
	OR			
Q.3(B)	What is Minimum Spanning Tree? Explain Kruskal's algorithm and trace with an example.	12M	3	4
Q.4(A)	Discuss various methods in Open Addressing to resolve collision in hashing.	12M	4	3
	OR			
Q.4(B)	Explain the Graph Traversal Methods.	12M	4	3
Q.5(A)	Explain Floyd's Warshall algorithm using Dynamic Programming with suitable example.	12M	5	4
	OR			
Q.5(B)	How is dynamic programming applied to solve the travelling salesperson problem? Explain in detail with an example.	12M	5	2

*** END***

Question Paper Code: 20MCAP109

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
MCA I Year II Semester (R20) Regular End Semester Examinations – November 2021
BLOCKCHAIN TECHNOLOGY

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 asymmetric cryptography with example. Illustrate the process of encryption and decryption using RSA for the following details p=17, q=11; e=7; M=2	12M	1	2
	OR			
Q.1(B)	Illustrate the role of cryptography in the age of quantum computers. Discuss the differentiation between SSL and TLS.	12M	1	3
Q.2(A)	Illustrate process of P2P Network. Also discuss Byzantine General problem concept with example scenario.	12M	2	3
	OR			
Q.2(B)	Explain in detail about Hadoop Distributed File System with examples.	12M	2	2
Q.3(A)	Explain the advantages of conventional distributed database. Discuss on Distributed Consensus.	12M	3	2
	OR			
Q.3(B)	How Mining Mechanism works in blockchain network? Discuss on Transactions Fee, Anonymity, Reward, Chain Policy.	12M	3	2
Q.4(A)	How to evaluate a difficulty Level? Explain in detail about Sybil attack with scenarios.	12M	4	2
	OR			
Q.4(B)	Illustrate the process of various distributed consensus.	12M	4	3
Q.5(A)	Discuss the advantages of Decentralized Blockchain Domains. Explain the concept of Smart contract and its Working principles.	12M	5	2
	OR			
Q.5(B)	Explain various applications of IoT and discuss on how does it work with the EVM principle.	12M	5	2

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
MCA I Year II Semester (R20) Regular End Semester Examinations – November 2021
AI TECHNIQUES AND 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)	Discuss the differences between "Forward and Back Propagation". Explain the idea behind the Artificial Neural Network.	12M	1	L4
	OR			
Q.1(B)	i) What are the various types of learning in Machine Learning and give few examples. Also, Explain which type of ML algorithms are suitable for which type of data/dataset and further explain, based on the "dataset size" which algorithms are suitable?	12M	1	L2
	ii) List out the AI applications that are present in your smartphone?			L3
Q.2(A)	List and explain the components of Natural Language Processing (NLP). Explain its enterprise applications.	12M	2	L3
	OR			
Q.2(B)	i) How NLP is used in analyzing messages/posts/tweets of social media websites like Facebook, Twittter etc.	12M	2	L4
	ii) Draw and explain the architecture of Chatbot.			L3
Q.3(A)	What do you understood by reinforcement learning? Explain "agents and environments" and action-value function in reinforcement learning.	12M	3	L2
	OR			
Q.3(B)	Define computer vision. Explain scenarios where computer vision is implemented. Discuss some use cases of computer vision.	12M	3	L4
Q.4(A)	i) What is meant by reinforcement learning and give an example?	12M	4	L1
	ii) Demonstrate any two of the working of reinforcement learnings playing?			L5
	OR			
Q.4(B)	Explain "agents & environments" and action-value function in reinforcement learning.	12M	4	L3
Q.5(A)	Analyze in detail the working of any two Artificial Intelligence smart applications.	12M	5	L6
	OR			
Q.5(B)	How artificial intelligence's smart applications like smart manufacturing, smart grids, and smart cities are applied in real life?	12M	5	L1

*** END ***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
MCA I Year II Semester (R20) Regular End Semester Examinations – November 2021
DESIGN THINKING

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)	'Principles of design thinking are in the form of a more generalised commitment to the alignment of system and participants'. Discuss.	12M	1	1
	OR			
Q.1(B)	'The primary stage of the design thinking process is often about discovering which constraints are important and establishing a framework for evaluating them'. Elucidate.	12M	1	1
Q.2(A)	Empathy is the pre-requisite of Design Thinking. Explain the types of Empathy. Summarize the recent exemplary empathetic personality Mr. Sonu Sood.	12M	2	1
	OR			
Q.2(B)	Explain Decision Making process with suitable illustrations.	12M	2	1
Q.3(A)	Brainstorming is a great way to gather ideas quickly during the ideate phase of design thinking. Discuss.	12M	3	2
	OR			
Q.3(B)	Discuss in detail about Mind Mapping skills and its significance.	12M	3	2
Q.4(A)	Define Prototyping. How does idea clustering, selection and grouping helps to develop a prototype?	12M	4	3
	OR			
Q.4(B)	Discuss in detail about the steps involved in bringing ideas to the life.	12M	4	3
Q.5(A)	How Design thinking transforms organisations and inspires innovation?	12M	5	3
	OR			
Q.5(B)	Suppose, if you are the minister of tourism, how design thinking can help you to rethink the very nature of hospitality?	12M	5	3

*** END***