MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)
Maisammaguda, Dhulapally, (Post Via Kompally), Secunderabad-500100.
B.TECH II YEAR I SEMESTER REGULAR EXAMINATIONS, MARCH-2022
SUBJECT: DISCRETE MATHEMATICS
BRANCH: CSE, IT, CSE(CS), CSE(AIML), CSE(DS), CSE(IOT)

Time: 3 hours   Max. Marks: 70

Answer any five questions   5X14M=70 M

Q NO.	QUESTIONS	Marks	BT LEVEL*	CO
1.	a) Obtain the principal conjective normal form $(P \wedge Q) \vee (\neg P \wedge Q) \vee (Q \wedge R)$ b) Define Tautology, contradiction with suitable examples.	7 7	L2	1
2.	a) Obtain the disjunctive normal form of $\sim(P \vee Q) \leftrightarrow (P \wedge Q)$ b) Demonstrate that **r** is a valid interface from the premises $p \rightarrow q, q \rightarrow r$ and p.	7 7	L3	1
3.	a) Determine the transitive closure of the relation $R = \{(a,a),(a,b),(b,c),(b,d),(d,c),(d,d)\}$ b) Define an equivalence relation on the set $A = \{1,2,3,4,5\}$ and justify your answer.	7 7	L2	2
4.	a) Let $f : R \rightarrow R$ be a function defined by f(x) =2x+3, determine f^{-1}. b) Show that the set of rational numbers excluding zero is an abelian group under multiplication.	7 7	L2 L3	3
5.	a) Prove that the fourth roots of unity {1, i, -i, -1} is an abelian group with respect to multiplication (.). b) Show that the set of even integers is an abelian group under multiplication.	7 7	L2 L3	3
6.	a) Determine the coefficient of $x^3 y^7$ in the expansion of $(2x-9y)^{10}$. b) How many ways are there to arrange the letters of the work MATHEMATICS.	7	L2	4
7.	a) Determine the coefficient of x^r in the expansion $\dfrac{8}{(2+3x)^2} + \dfrac{1}{(5+x)}$ b) Solve the recurrence relation $a_n - 3a_{n-1} + 3a_{n-2} - a_{n-3} = 0, \; n \geq 3$	7 7	L2	5
8.	Solve the recurrence relation $a_n - 9a_{n-1} + 14a_{n-2} = 7^n, \; n \geq 2$	14	L3	5

*Bloom's Taxonomy Level (BT Level): L1-Remember, L2- Understand, L3- Apply, L4- Analyse, L5- Evaluate, L6- Create.

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B.TECH II YEAR I SEMESTER REGULAR EXAMINATIONS, MARCH-2022

SUBJECT: COMPUTER ORGANIZATION AND ARCHITECTURE
BRANCH: COMMON TO CSE, IT, AIML, CS, DS, IOT

Time: 3 hours   Max. Marks: 70

Answer any five questions   5X14M=70 M

Q.NO.	QUESTIONS	MARKS	*BT LEVEL	CO
1.	a) What is shift register? Discuss the general capabilities of shift registers.	7	L2	1
	b) Construct excitation table of JK flip flop.	7		
2.	a) Demonstrate the steps involved in Instruction Cycle.	7	L2	2
	b) What is meant by memory reference instruction? List them and explain.	7		
3.	a) What are the basic computer instruction formats? Discuss in brief.	10	L3	2
	b) With the help of a diagram explain timing and control signals.	4		
4.	a) Analyze the design of control unit in Micro Programmed Control.	7	L2	3
	b) Outline on symbolic micro program. Explain.	7		
5.	Define Addressing Mode? Explain different types of addressing modes with examples.	14	L2	3
6.	a) Analyze different data types with examples.	7	L4	2
	b) Summarize about floating –point representation.	7		
7.	a) Illustrate memory hierarchy in detail.	7	L2	4
	b) Explain the associate memory with a neat diagram.	7		
8.	a) Draw the block diagram and explain how data is transferred with the help of DMA.	7	L3	4
	b) Discuss the following in detail: i) Priority Interrupt ii) Daisy-Chaining Priority.	7		

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B.TECH II YEAR I SEMESTER REGULAR EXAMINATIONS, MARCH-2022

SUBJECT: DATA STRUCTURES
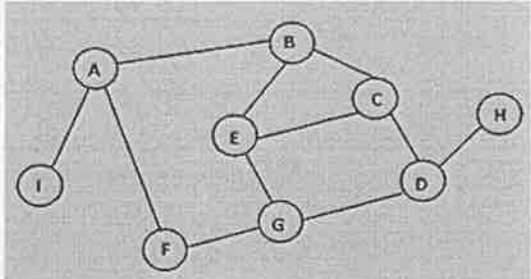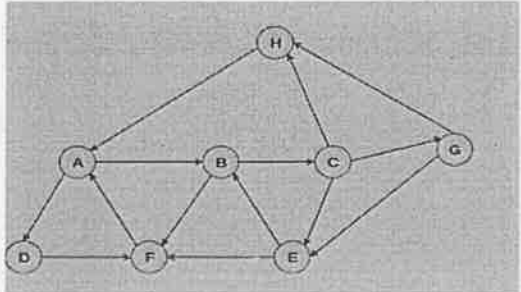### BRANCH: CSE, CSE (DS, IOT, CS, AIML) & IT

Time: 3 hours   **Max. Marks: 70**

Answer any five questions   5X14M=70 M

Q.NO.	QUESTIONS	MARKS	*BT LEVEL	CO
1.	a) Explain singly linked list representation in detail with an example. b) What do you mean by non-linear data structure? Give an example. c) What do you linear data structure? Give an example.	6 4 4	L2	1
2.	a) Explain the array implementation of queue ADT in detail? b) Explain the linked list implementation of stack ADT in detail?	7 7	L2 L2	1
3.	a) How do you represent Hash Table? Explain. b) What is dictionary explain skip list and its operations?	7 7	L2	2
4.	a) Construct an AVL tree using the following sequence of data: 13, 29, 19, 127, 18, 108, 199, 81. (b) Construct a search Binary tree using the following sequence of data: 113, 29, 11, 127, 18, 108, 199, 81, 45, 34, 567.	7 7	L3	3
5.	a) Implement the Breadth First Search traversal method on below given graph. b) Implement Merge Sort Technique on the following numbers 12, 16, 89, 32, 65, 2, 18.	7 7	L3	4
6.	a) Implement the Depth First Search traversal method on below given graph. b) Construct max heap for the following sequence of input: 5 14 16 13 10 7 12.	7 7	L3	4
7.	a) What is pattern matching algorithm explain with example? b) What is the importance of Binary tries and discuss its applications?	7 7	L2	5
8.	Which are the two popular pattern matching algorithms? Explain them with suitable examples in detail.	14	L2	5

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B.TECH II YEAR I SEMESTER REGULAR EXAMINATIONS, MARCH-2022

SUBJECT: OBJECT ORIENTED PROGRAMING
BRANCH: CSE, CSE (IOT, DS, CS, AIML), IT

Time: 3 hours   Max. Marks: 70

Answer any five questions   5X14M=70 M

Q.NO.	QUESTIONS	MARKS	*BT LEVEL	CO
1.	a) How abstraction and encapsulation is performed in object oriented programming? b) Write a Java program to reverse a number and print the sum of the number in single digit. Sample Input: 4598 Output: 8954 sum=26=8	7 7	L2	1
2.	a) Write a Java program to find the factorial of a number using command line arguments. Explain the structure of java program. b) Differentiate between class and object. Create a class name vehicle and add the necessary features. Include methods to get and display the values.	7 7	L3	1
3.	a) Explain how multilevel inheritance is done. Illustrate with an example. b) How to define a user exception? Illustrate with an example.	7 7	L2	2
4.	a) What is package? How to create package? Give example. b) Explain about java.io.package.	7 7	L2	3
5.	a) With suitable code segments illustrate various uses of 'final' keyword. b) How to handle multiple catch blocks for a nested try block? Explain with an example.	7 7	L3	3
6.	a) Explain about thread life cycle and its methods. b) Write a JAVA program which will generate the threads: - To display the 'n' terms of Fibonacci series. - To display the prime numbers between 1 to 100 in reverse order	7 7	L3	4
7.	a) Differentiate between array list and linked list. b) Write a Java program to sort and reverse the linked list elements. Assume the linked list consists of student name and regno.	7 7	L2	4
8.	a) What is the role of event listeners in event handling? List the Java event listeners b) Write a program to explain mouse events.	7 7	L3	5

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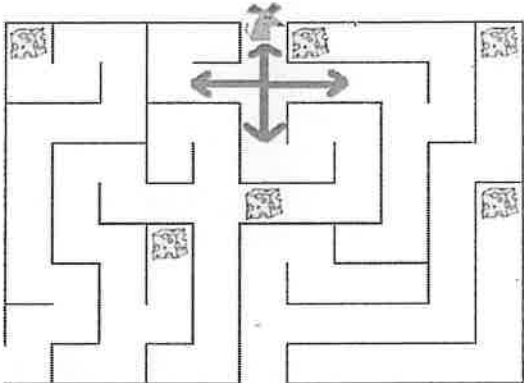
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B.TECH II YEAR I SEMESTER REGULAR EXAMINATIONS, MARCH-2022
SUBJECT: FUNDAMENTALS OF ARTIFICIAL INTELLIGENCE
BRANCH: CSE (AIML)

Time: 3 hours | Max. Marks: 70

Answer any five questions | 5X14M=70 M

Q.NO.	QUESTIONS	MARKS	*BT LEVEL	CO
1.	a) Define AI and solve Tic Tac Tie game.	7		
	b) Suppose that you are given 3 jugs A,B,C with capacities 8,5 and 3 liters respectively but are not calibrated (i.e. no measuring mark will be there). Jug A is filled with 8 liters of water. By a series of pouring back and forth among the 3 jugs, divide the 8 liters into 2 equal parts i.e. 4 liters in jug A and 4 liters in jug B. How?	7	L3	1
2.	a) Formulate the problem, find the constraints and determine the solution space.	7	L3	1
	b) Discuss state space search.	7		
3.	a) Explain BFS algorithms with suitable example.	7	L2	2
	b) What is constraint satisfaction problem? Explain it with an example.	7		
4.	a) Discuss bayes theorem and explain in each term.	7	L2	
	b) Explain about exact inference in Bayes network.	7		3
5.	a) Describe Hidden Markov model with an example	7		
	b) Three boxes labeled as A, B, and C, are present. Details of the boxes are: Box A contains 2 blue and 5 pink ballons Box B contains 3 blue and 10 pink balloons And box C contains 1 blue and 4 pink balloons All the three boxes are identical having an equal probability to be picked up. Therefore, what is the probability that the blue balloon was picked up from box A? How bayes theorem is implemented for this example?	7	L3	3
6.	a) Explain about value iteration.	7	L2	4
	b) Discuss about Policy iteration.	7		
7.	a) Discuss about MDP Formulation.	7	L2	4
	b) Explain about Utility functions.	7		4
8.	a) Discuss in detail about Active Reinforcement learning.	7	L2	5
	b) How Temporal Difference learning works ?	7		

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B.TECH II YEAR I SEMESTER REGULAR EXAMINATIONS, MARCH-2022

SUBJECT: GENDER SENSITIZATION
BRANCH: CSE, CSE (DS, IOT, CS, AIML) & IT

Time: 3 hours   Max. Marks: 70

Answer any five questions   5X14M=70 M

Q.NO.	QUESTIONS	MARKS	*BT LEVEL	CO
1.	a) Explain Why should we study Gender Sensitization?	7		
	b) Explain the story of Gogushyamala "radam story".	7	L2	1
2.	a) Discuss about first lesson in caste.	7	L2	
	b) Why Gender Sensitization is important? Discuss about basic Gender concepts.	7	L3	1
3.	a) List out the problems of why sons are preferred over daughters.	7		
	b) Explain the struggles against sex selective abortions.	7	L2	2
4.	a) What are Gender Role and Relationship?	7		
	b) Write about women – Sex selection and its consequences.	7	L2	2
5.	a) List of three important aspects of being a good husband.	7		
	b) Explain about invisible labour at home.	7	L2	3
6.	a) Explain your experience about are boys taught housework while growing up.	7	L2	3
	b) Discuss about gender and human rights.	7		
7.	a) "Is home a safe place" explain in detail.	7		
	b) Write about types of Gender based Violence.	7	L2	4
8.	a) Explain about gender and the structure knowledge.	7		
	b) Explain an unacknowledged women artist Mah Laqa Bai's story.	7	L2	5

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