Code No: 30510/40511

MR13&MR14

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)

Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad

II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER-2019

Subject: **FORMAL LANGUAGE & AUTOMATA THORY**

Branch: **CSE**

Time: 3 hours **Max. Marks: 75**

PART – A

I. Answer ALL questions of the following **5x1M=5 M**

1. What are the different ways of representing FSM?
2. Define Moore machine.
3. Define CFG.
4. Define push Down Automata (PDA).
5. Give the basic model of tuning machine.

II. Answer ALL questions of the following **10x2M=20 M**

1. Give DFA which reads strings from {a, b} and ends with aaa.
2. Explain the infinite Automaton model.
3. What do you mean by equivalence of NFA and DFA?
4. Give examples for FA with output.
5. Given that A is regular and AUB is regular, does it follow that B is necessarily regular? Justify your answer.
6. Distinguish Regular Grammar and Context Free Grammar.
7. Show that the grammar G with production

   S→ a|aAb|abSb

   A→aAAb|bS is ambiguous.
8. Show that the grammar is ambiguous

   S→S|S

   S→a.
9. Define linear bounded automata.
10. Define multi-tape Turing machine.

PART-B

Answer ALL questions of the following **5x10 M= 50M**

1. Obtain a DFA to accept strings of a's and b's having even number of a's and b's.

OR

2. Obtain an NFA which accepts strings of a's and b's starting with the string ab.

3. Prove that L={w|*w* is a palindrome on { a,b}*} is not regular. i.e., L={aabaa, aba, abbbba,...}.

OR

4. Obtain an NFA for a language consisting of all strings over {0,1} containing a 1 in the third position from the end.

5. a) Construct Right and Left Linear grammars for the language $L=\{a^n b^m / n \geq 2, m \geq 3\}$

   b) Construct NFA for the following Regular expression

   0+10*+01*0+(01+110) .

OR

6. Obtain a Right linear Grammar for the language $L=\{ a^n b^m$/Where $n \geq 2, m \geq 3 \}$.

7. Find a GNF grammar equivalent to the following G = $\{\{A_1, A_2, A_3\}, \{a,b\}, P, A]$ where P consists of the following $A_1 \rightarrow A_2A_3$, $A_2 \rightarrow A_3A_1/b$, $A_3 \rightarrow A_1A_2/a$.

OR

8. Construct PDA for the given grammar

   S→aA , A→aABC /bB /a , B→b , c →c.

9. Give LR (0) items for the grammar S^1 —>S , S—>aSa/bsb/c. Find its equivalent DFA check the pairing by taking suitable example.

OR

10. Design a Turing Machine (TM) that accepts the set of all even palindromes over {0,1} .

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II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER-2019

Subject: **DESIGN AND ANALYSIS OF ALGORITHMS**

Branch: **CSE**

Time: 3 hours **Max. Marks: 75**

PART – A

I. Answer ALL questions of the following **5x1M=5 M**

1. Define space complexity.
2. Define feasible solution.
3. Define Dynamic programming.
4. Define explicit constraints of backtracking
5. Define NP-complete

II. Answer ALL questions of the following **10x2M=20 M**

1. Define Disjoint sets.
2. What is Graph Problem
3. When do you say a tree as minimum spanning tree?
4. List the drawbacks of merge sort algorithm.
5. Write about general method of dynamic programming.
6. List the properties of Dynamic programming approach.
7. Write about the applications of Backtracking.
8. What is state space tree.
9. Define deterministic problem.
10. State the concept of Branch and Bound.

PART-B

Answer ALL questions of the following **5x10 M= 50M**

1. What is an articulation point? Write an algorithm to eliminate articulation point.

OR

2. State and explain different categories of randomized algorithms.
3. a) What is the solution generated by the function Job sequencing when N=7,(P1, P2, ...P7) = (13, 50, 20, 18, 41, 69, 30) and (d1, d2, d7) (1, 3, 4, 3, 6, 5, 9)
   b) What is Greedy method and discuss its applications.

OR

4. What is knapsack problem? Find an optimal solution to the knapsack instance n=3, m=20, (pl, p2, p3) = (25,24,15) and (w 1, w2, w3) = (18,15,10)
5. a) Explain matrix chain multiplication using dynamic programming.
   b) Explain about optimal binary search trees.

OR

6. Discuss how dynamic programming can be used in multiplying a chain of matrices.
7. Explain with an algorithm how backtracking works for solving 8-queens problem.

OR

8. a) Explain the control abstraction for Backtracking method. How 8 Queens Problem could be solved using backtracking method? Explain.
   b) How to solve the sum of subset problem with explanation of its time complexity.

9. a) What is bounding? Explain the principles and applications of bounding.
   b) Compare and Contrast LC — BB and FIFO BB.

OR

10. State and prove Cook's theorem. Explain its significance in NP-complete theory.

Code No.: **40508** **MR14**

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III B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER-2019

Subject: **DATABASE MANAGEMENT SYSTEMS**

Branch: **CSE**

Time: 3 hours **Max. Marks: 75**

PART – A

I. Answer ALL questions of the following **5x1Mark=5 Marks**

1. Write the advantages of DBMS over File oriented System.
2. What is relational algebra?
3. What is Trivial Dependency?
4. Define atomicity.
5. Define Static Hashing.

II. Answer ALL questions of the following **10x2Marks=20 Marks**

1. Describe DDL Commands With an Example.
2. Explain attribute and entity sets with an example.
3. Explain the structure of RDBMS.
4. Explain triggers with an example.
5. With an example explain BCNF.
6. What is Decomposition Explain?
7. List and Explain ACID Properties.
8. Write about Timestamp based protocols.
9. Explain Dynamic Hashing?
10. Explain about B-Tree index files.

PART-B

Answer ALL questions of the following **5x10 Marks= 50Marks**

1. Define Data Model? Explain the application of various data Models.

OR

2. Explain ER Model? Draw the ER Diagram for banking enterprise application.
3. Differentiate aggregate and join operations with example.

OR

4. Explain about Correlated queries and Sub Queries.
5. Define Normalization? Explain Various Normalization Techniques.

OR

6. What is Schema refinement? Explain the Problems caused by Redundancy.
7. What is recoverability Lock based protocols Explain?

OR

8. What is Multiple Granularity? Give an Example.
9. Compare and contrast Indexing and hashing?

OR

10. Explain B+ Tree Index files with an Example.

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II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER-2019

Subject: **OBJECT ORIENTED PROGRAMMING**

Branch: **CSE**

Time: 3 hours **Max. Marks: 75**

PART – A

I. Answer ALL questions of the following **5x1Mark=5 Marks**

1. What is scope of a variable?
2. Define Final Keyword.
3. What is extended interfaces?
4. Define thread.
5. Define Applet.

II. Answer ALL questions of the following **10x2Marks=20 Marks**

1. How Java differs from C and C++?
2. Write the applications of object oriented programming.
3. Define abstract classes
4. Define CLASS PATH.
5. Why exception handling is important?
6. Write the usage of throw, throws and finally.
7. What is runnable interface?
8. Write about thread exceptions.
9. Distinguish between swings Vs AWT.
10. Define Layout managers. Give an Example.

PART-B

Answer ALL questions of the following **5x10 Marks= 50Marks**

1. Write the concept of array with an example.

(OR)

2. Describe the features of (buzzwords) Java Programming language.
3. Define inheritance. Write a java program for multiple inheritance.

(OR)

4. What is method overloading? Write a Java program to method overloading.
5. Explain java.lang and java.util packages with an example.

(OR)

6. Write a java program for exception handling.
7. Explain multi-threading with an example program.

(OR)

8. Why socket programming? Write a simple socket program in java.
9. Write a java Program for handling a button clicks.

(OR)

10. Write in detail about event sources and listeners.