MR13 / MR14

Code No.: **30510/40511**

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-2018

Subject: **Formal Languages and Automata Theory**

Branch: **Common to CSE & IT**

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

PART – A

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

1. Define Finite State Machine
2. When can you say the language is accepted by FA?
3. Define Left Most Derivation
4. Draw the graphical representation of PDA.
5. What is LR(o) grammar?

II. Answer ALL questions of the following **10x2Mark=20 Marks**

1. Design NFA for (0+11)
2. Design a DFA which accepts strings with even number of 0's followed by single 1 over $\sum$ = {0,1}.
3. What is the significance of ϵ-transitions in FA?
4. Give examples for FA with output.
5. Convert the following Regular expression into NFA(((100)*(11))01)*
6. Distinguish Regular Grammar and Context Free Grammar?
7. Simplify the following grammar
   a. S→AB, A→a, B→C, B→b, C→D, D→ϵ
8. Find an unambiguous CFG equivalent to the grammar with productions S→aaaaS/aaaaaaaS/ϵ 8.
9. Define multi-tape Turing machine
10. Explain linear bounded Automaton.

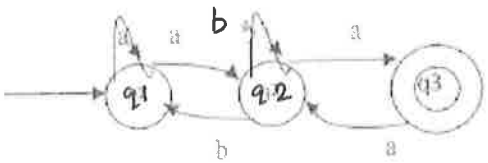
PART-B

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

1. Write DFA to accept strings of 0's, l's & 2's beginning with a 0 followed by odd number of l's and ending with a 2.

OR

2. Construct a DFA accepting the set of string with an even number of 0's and even numbers of 1's over the alphabet {0,1}
3. a) Construct FSA with c-transition (null transition) for the regular expression r=(ab+aba)*
   b) Consider the transition system given in figure. Prove that the string recognized are (a+a(b+aa)*b)*a(b+aa)*a



OR

4. a) Consider the Mealy machine described by the transitions given in the table. Construct Moore machine which is equivalent to the Mealy machine.

Present state	Next state			
	Input a = 0		Input a=1	
	State	Output	State	Output
ql	q3	0	q2	0
q2	q1	1	q4	0
q3	q2	1	q1	1
q4	q4	1	q3	0

b) Using pumping lemma, prove that L = $\{a^i b^i c^i / i >= 1\}$ is not a CFL

5. Find the regular expression for the following
   a) Set of all strings do not contain "ab" as sub string.
   b) Set of all strings should not contain 3 consecutive 0's
   c) Set of all strings where 10^{th} symbol from right end is 1.
   d) Set of all the stings contain even number of 0's and odd number of 1's.
   e) Set of all the strings where number of occurrences of 0's is divisible b y 3.

OR

6. Construct FA to accept RE
   a) (0+1)* (00+11)(0+1)*
   b) (1+01+001)*(0+00)
7. Define Griebach Normal Form for a CFG. Find GNF for the following grammar.

   E→E+T/T T →T*F/ F F→(E)/a

OR

8. a) Construct a PDA accepting $\{ a^n b^{2n} / n \geq 1\}$ by empty store.
   b) Find whether the given grammar is finite or infinite?

   S→AB, A→B, C→a, B→C, C→b

9. Prove that PCP is un-decidable.

OR

10. a) Construct TM for f(a, b) = a*b, a and b are unary numbers.
    b) Write short notes on PCP and MPCP with examples.

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II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER-2018

Subject: **COMPUTER GRAPHICS**

Branch: **CSE**

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

PART – A

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

1. What are the applications of Computer Graphics?
2. List the basic 2D transformation techniques.
3. Draw few Bezier curves?
4. Give 3D transformation matrix for shear.
5. Define BSP?

II. Answer ALL questions of the following **10x2Mark=20 Marks**

1. List the advantages of interactive graphics.
2. What are the properties of a circle?
3. Write the Composite Transformation matrix for Translations & Rotations?
4. Find the new position P' after translation for the point P(2,3) if the translation distance is T(5,5).
5. Write a note on polygon meshes?
6. Define vector generation.
7. Explain Viewing Pipeline with a neat diagram?
8. Express the 3D rotation in matrix form i) rotation about X-axis ii) rotation about Z-axis.
9. Describe direct motion specification for explicit control of animation.
10. What are the functions of depth-sorting method?

PART-B

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

1. a) Write the steps involved in the Bresenham's algorithm.

   b) Draw the line segment between the two end points (30, 18) and (20, 10) using Bresenham's algorithm.

   OR

2. Difference between raster scan and random scan
3. Explain the working of the Sutherland-Hodgeman algorithm for polygonal clipping with an example.

   OR

4. Explain the line-clipping algorithm using midpoint sub-division approach.
5. Explain Spline Representations?

   OR

6. What are various properties of Bezier curve and B-spline curve?
7. Explain briefly about parallel projection and perspective projections.

   OR

8. What is a 3-D rotation? Derive the expression for 3-D rotational transformation matrix.
9. Explain how the visible surfaces of a polyhedron are determined using BSP tree method.

   OR

10. Discuss about key frame systems.

Code No.: **30511** | **MR13**

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II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER-2018

Subject: **Design and Analysis of Algorithms**

Branch: **CSE**

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

PART – A

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

1. What is time complexity?
2. What is the time complexity of quick sort?
3. What is minimum spanning tree?
4. What is Graph Coloring?
5. What is NP hard problem?

II. Answer ALL questions of the following **10x2Mark=20 Marks**

1. Give the characteristics of an Algorithm?
2. What is Theta (Θ) notation explain with example?
3. Write the find algorithm?
4. Explain the terms feasible solution, optimal solution
5. What is the principle of the optimality? Give suitable example?
6. Write the differences between kruskals and Prims algorithm
7. What is state space tree write with an example?
8. Write the differences between dynamic knapsack and Branch & Bound Knapsack
9. What is chromatic number of a graph?
10. What is P class problem give example?

PART-B

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

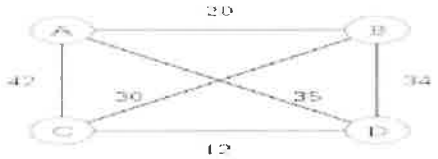
1. Explain the performance analysis of an algorithm with examples?

OR

2. Explain Depth first search of a graph with example? And write the algorithm for DFS and anlyze its time complexity
3. Derive time complexity of binary search algorithm and explain with example?

OR

4. Explain single source shortest path algorithm with an example.
5. For the following graph obtain the optimum cost tour(TSP using Dynamic programming)



OR

6. Write an algorithm for matrix chain multiplication with an example.
7. Solve the 8-queen problem for a feasible sequence (6,4,7,1)

OR

8. Discuss a backtracking algorithm that finds all the Hamiltonian cycles in a graph.
9. Solve the 0/1 knapsack problem using branch and bound method for the following data M=15 n=4 (p1,p2,p3,p4)=(10,10,12,18) (w1,w2,w3,w4)=(2,4,6,9)

OR

10. State and prove COOk's Thereom

Code No.: **30506** **MR13**

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II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER-2018

Subject: **Computer Organization**

Branch: **CSE**

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

PART – A

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

1. Explain Functional units of computer
2. Define logic micro operations
3. Define Control memory
4. What is RAID?
5. Define Pipelining

II. Answer ALL questions of the following **10x2Mark=20 Marks**

1. Explain about Software and Performance of computer
2. Describe multiprocessors and multi computers
3. Define and explain Reduced Instruction set computer
4. Define and Explain Reference Instructions
5. What are Decimal Arithmetic operations?
6. Explain Micro programmed control
7. Define and explain Peripheral Devices
8. Describe Input-Output Interface
9. Explain Characteristics of Multiprocessors
10. What are different Interconnection Structures?

PART-B

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

1. a) Define and explain Error Detection codes. 6M
   b) Discuss about different Computer Types and its advantages 4M

(OR)

2. a) Explain about Fixed Point Representation. Floating – Point Representation 6M
   b) Discuss about basic operational concepts of computer 4M
3. a) Explain about STACK organization and Instruction formats 4M
   b) Discuss about different Addressing modes 6M

(OR)

4. a) Explain about Input – Output and Interrupt 5M
   b) Explain about instruction codes and computer Registers 5M

5. Explain about multiplication Algorithms with example

(OR)

6. a) What is Address Sequencing and design of control UNIT hard wired control? 5M

b) Define and explain Control memory, micro program example 5M

7.a) Explain about peripheral component and Interconnect (PCI) bus. 5M

b) Explain about asynchronous data transfer Modes of Transfer and Priority Interrupt 5M

(OR)

8. a) Explain about semiconductor RAM memories 5M

b) Discuss about standard serial communication protocols 5M

9. a) Explain about Arithmetic Pipeline and Instruction Pipeline 5M

b) Explain about Inter Processor Communication and Synchronization Cache Coherence 5M

(OR)

10 a) Explain Inter processor Arbitration. 5M

b) Discuss about advantages of vector processing 5M

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II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER-2018

Subject: **OPERATING SYSTEMS**

Branch: **Common to CSE & IT**

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

PART – A

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

1. What is the difference between a program and a process?
2. Explain starvation.
3. What is Resource Allocation Graph?
4. Mention the file allocation methods.
5. What is Trojan Horse?

II. Answer ALL questions of the following **10x2Mark=20 Marks**

1. Explain the operating system structure in UNIX
2. Explain Short term scheduler and long term scheduler.
3. What is starvation? How can you avoid the problem?
4. Define Segmentation.
5. Is it possible to have a deadlock involving only a single process? Explain your answer.
6. What is circular wait?
7. Explain disk structure in brief.
8. Discuss in detail about file system.
9. Explain asymmetric encryption in brief.
10. Explain about denial of service.

PART-B

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

1. a)What is CPU Scheduling Explain the criteria for CPU scheduling

   b) Consider the following set of processes

Process Name	Burst Time	Arrival Time
P1	10	0
P2	1	1
P3	2	4
P4	5	5
P5	10	6

   i) Perform RR scheduling to find the average waiting time if time quantum is 2

   ii) Find the turn around time for process p3

OR

2. What is Process Control Block? Explain its structure.
3. Explain critical section and mutual exclusion with respect to producer consumer problem.

OR

4. Explain paging. Discuss the structure of the page table.
5. a) Explain how double buffering improves the performance than a single buffer for I/O.

   b) Differentiate between logical I/O and Device I/O.

OR

6. Explain how the operating systems transform I/O requests to hardware operations.
7. a) Explain about free space management in detail.

   b) What are the various file access methods?

OR

8. Explain Free disk space management.
9. Explain how cryptography is used as a security tool.

OR

10. Explain how the access matrix is implemented. Write their pros and cons

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II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER-2018

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. Define DBMS?
2. Define view and triggers?
3. Explain aggregate operations?
4. What is transaction management?
5. What is serializable schedule?

II. Answer ALL questions of the following **10x2Mark=20 Marks**

1. Give the levels of data abstraction?
2. Define entity set and relationship set?
3. Explain tuple and attribute?
4. Define candidate key, primary key and super key?
5. What are the three clauses of SQL expression?
6. List the set operations of sql?
7. What is meant by normalization of data?
8. What are the types of storage devices?
9. Which level of RAID is best? Why?
10. What is a B+ tree index?

PART-B

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

1. Explain Database system applications?

OR

2. Explain Advantages of DBMS over file system?
3. Explain the different types of integrity constraints with suitable example?

OR

4. Discuss the various DDL, DML with illustrations in SQL?
5. Explain 1NF, 2NF, 3NF and BCNF with suitable examples?

OR

6. Define Decomposition? Explain lossless join decomposition?
7. What is the difference between i) stable storage and disk ii) system crash and checkpoints

OR

8. Define these terms atomicity, consistency, isolation, durability and schedule write.
9. Give algorithms for inserting a new key in to a B tree?

OR

10. Explain dynamic hashing?

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II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER-2018

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 Type Casting.
2. Is there any difference between length() and length.Justify.
3. An Interface can extend only one interface at a time .(TRUE/FALSE)
4. What are the methods to prevent thread execution.
5. List different Layout Managers.

II. Answer ALL questions of the following **10x2Mark=20 Marks**

1. What are the rules to define java Identifier?
2. What are static,local,instance variables in Java.
3. What are the rules to be followed for method overriding.
4. What is default Constructor.
5. What is the importance of CLASSPATH variable.
6. What is finally block?
7. what are the advantages and disadvantages of synchronization.
8. How to set the priority for threads.
9. What are the different ways to run an Applet.
10. What are the different key board events.

PART-B

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

1. Explain the basic concepts of object oriented programming for an effective software development?

(OR)

2. What is the purpose of Wrapper classes ?
3. Discuss different levels of access protections available in java.

(OR)

4. Explain the different forms of inheritance and its importance in application development?
5. What are the different classes and interfaces present in java.util package?

(OR)

6. What is the importance of Exception handling in java?distinguish thow and throws clause with a suitable example?
7. Explain Multithreading using Runnable interface with a suitable program?

(OR)

8. Develop a TCP Socket for a simple client-server comunication.
9. Design an applet to display a simple calculator?

(OR)

10. Explain in detail MVC architecture?

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II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER-2018

Subject: **Computer Organization**

Branch: **CSE**

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

PART – A

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

1. What is Shift Micro Operation?
2. What is Instruction Code?
3. What is Main Memory?
4. Define RISC.
5. What is Direct Addressing?

II. Answer ALL questions of the following **10x2Mark=20 Marks**

1. What are the Computer Types? Explain it
2. What is the Difference between Micro Operation and Macro Operation?
3. Explain about Computer Instructions.
4. Explain about Program Control.
5. What is Control Memory? Draw Control Memory Block Diagram.
6. Explain about Memory Hierarchy.
7. What are the I/O Operations? Explain it
8. Explain about Pipelining.
9. Explain about Array Processor
10. Explain MISD Processors.

PART-B

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

1. (a) What is RTL? Explain about RTL Operations.

   (b) What is Micro operation? Explain all Arithmetic Micro operations.

OR

2.(a) Draw a neat sketch of Interconnection of the bus structure.

(b) Draw a block diagram of 4 bit Arithmetic adder circuit.

OR

3. (a) Explain briefly about Memory Reference Instructions.

   (b) Explain all Addressing Modes with suitable examples

OR

4. (a) Explain briefly about Data Transfer and Manipulation instructions.

   (b) Explain about Stack Organization with example.

OR

5. (a) What are the difference between Hardwired and Micro programmed control

   (b) What is Cache Memory? Explain briefly about it.

OR

6. (a) Draw a block diagram of Control Unit.

   (b) Explain briefly about Auxiliary Memory with neat sketch.

OR

7. (a) Explain booths multiplication algorithm

   (b) What are the Modes of Transfer? Explain it.

OR

8. (a) Explain about DMA Transfer

   (b) Explain about Priority Interrupts.

OR

9. (a) What are the types of Pipelining? Explain all.

   (b) Explain briefly about Vector Processing

OR

10.(a) Explain briefly about RISC.

   (b) Explain about Parallel Processing