

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, MAY-2018**Subject: Operating Systems

Branch: Common to CSE & IT

Time: 3 hours

Max. Marks: 75

PART-A**I. Answer ALL Questions of the following**

5x1M=5M

1. Define boot strap loader.
2. Define fragmentation.
3. By seeing the graph explain whether deadlock has occurred or not.



4. What are the different file access methods?
5. What is malware?

II. Answer ALL Questions of the following

10x2M=20M

1. What is a process? Explain different process states.
2. What is multi tasking?
3. Mention the criteria for the solution of critical section problem.
4. Write about Belady's Anomaly.
5. Explain Critical section problem.
6. Explain safe state with an example.
7. Explain how directory implementation is done using linked list.
8. Explain the common file types.
9. Write briefly about trap door.
10. Explain about different threats.

PART-B**Answer ALL Questions of the following**

5x10M=50M

1. a) Explain the services provided by an operating system.
b) Explain about system calls.

OR

2. Distinguish between process and thread. Explain clearly about process scheduling and thread scheduling.

3. a) Explain about contiguous memory allocation. Discuss the merits and demerits. [6M]
b) Perform least recently used page replacement algorithm for the following reference string whose frame size is 3. Find also the no. of page faults
Reference string: 2 3 2 1 5 2 4 5 3 2 5 2 [4M]

OR

4. a) Explain about demand paging.
b) Perform optimal page replacement for the following reference string with frame size 4.
Reference string : 1,2,3,4,5,3,4,1,6,7,8,7,8,9,7,8,9,5,4,5,4,2.
5. a) Explain about banker's algorithm for dead lock avoidance. [7M]
b) Give the notation for RAG. Explain with example. [3M]

OR

6. a) Discuss necessary conditions for happening deadlock.
b) Explain the bankers algorithm for deadlock avoidance.
7. a) Discuss the criteria for choosing a file organization.
b) Describe indexed file, indexed sequential file organization.

OR

8. a) What is free space list?
b) Explain the four approaches to free space management.
9. a) Discuss the security mechanisms followed by UNIX Systems.
b) How to revoke access rights.

OR

10. a) Explain the principles of protection. [5M]
b) Explain the goals of protection. [5M]

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II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2018Subject: Database Management 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. Explain data abstraction.
2. What are the different types of Joins
3. What is normalization?
4. What is recoverable schedule? Explain with example.
5. What is difference between primary and secondary indexing?

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

1. Discuss the usage of ISA feature in EK diagram with an example.
2. What are the different database languages?
3. Relational calculus is said to be a declarative language, in contrast to algebra which is a procedural language. Explain the distinction.
4. What is relational calculus?
5. List out various set comparison operators in SQL.
6. What is nested query?
7. What is multiple granularity
8. Define concurrency control
9. What is a primary and secondary index?
10. Define heap file organization.

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

1. Construct on ER diagram for a university database. University maintains data about students, faculty, their departments, their courses, facilities. Determine the entities and relationships.

OR

2. a) Explain the Transaction Management in a Database.
b) Discuss the Query Processor of Database System Structure.
3. Explain about the following
 - a) Key constraints
 - b) Specifying foreign key constraints in SQL with an example
 - c) Relational calculus.

OR

4. a) With a neat sketch explain what is relational model?
b) What is meant by Querying relational data?

[6M]**[4M]**

5. a) Specify the syntax for triggers in SQL and explain with example.

b) Write the SQL queries for the following.

Suppliers (sid, Sname, Address)

Parts (Pid, Pname, color)

Catalog (sid,pid,cost)

i) Find sids of suppliers who supply a red and a green part

ii) Find sids of supplier who supply only red parts.

iii) Find every suppliers that only supplies green parts, print the name of the supplier.

OR

6. a) Write the SQL expressions for the following Relational Database.

Sailor (Sid, SName, rating, age)

Reserves (Sid, Bid, Day)

Boats (Bid, BName, Color)

(i) Find the age of the youngest sailor for each rating level.

(ii) Find the age of the youngest sailor who is eligible to vote for each rating level with at least two such sailors.

(iii) Find the number of reservations for each red boat.

(iv) Find the average age of sailor for each rating level that at least 2 sailors.

b) Explain complex integrity constraints with example.

7. a) Explain check pointing in ARIES.

b) Explain log based Recovery

OR

8. a) Explain remote Backup system.

b) Explain three main properties of ARIES Algorithm.

9. Explain the following a) Cluster indexes b) Primary and secondary indexes c) Clustering file organization

OR

10. a) Compare the ordered Indexing with Hashing.

b) Compare Linear Hashing with extendable Hashing.

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II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2018Subject: Formal Languages and Automata Theory

Branch: CSE & IT (Only MR13)

Time: 3 hours

Max. Marks: 75

PART-A**I. Answer ALL questions of the following**

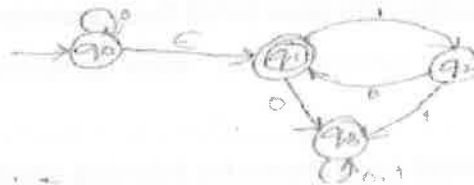
5 x 1M=5 M

1. What is the difference between DFA and NFA?
2. Draw the transition diagram for the string 010.
3. Define Right Most Derivation
4. What is an ambiguous grammar?
5. Define P problems

II. Answer ALL questions of the following

10 x 2M=20 M

1. Differentiate Kleene Closure and Positive Closure.
2. Design DFA which accept all strings which are ending with 101 over an alphabet {0,1}
3. What are the types of automata?
4. Write the E-closure for all the states in the transition diagram given below.



5. Write the steps to convert RE to FA.
6. Write the steps involved in conversion of FA to RE.
7. Can push down automata accept the regular language?
8. Remove ϵ productions from $S \rightarrow aSa | bSb | \epsilon$
9. What is Decidable and Un-decidable problem?
10. Is the $a^n b^n c^n$ context sensitive? Explain.

PART-B**Answer ALL questions of the following**

5 x 10 M=50 M

1. a) Construct a DFA equivalent to NFA given below. $M = (\{q_0, q_1, q_2, q_3\}, \delta, q_0, \{q_3\})$, where δ is define in the following transition table. (5m)

δ	0	1
q_0	$\{q_0, q_1\}$	$\{q_0\}$
q_1	$\{q_2\}$	$\{q_1\}$
q_2	$\{q_3\}$	$\{q_3\}$
q_3	ϕ	$\{q_2\}$

- b) Prove that for every NFA accepting a language L, there exist an equivalent DFA accepting the same language L.

OR

2. a) Design a DFA which accepts all strings which does not contain substring ab over input symbol set $\{0,1\}$
- b) Design DFA that accepts the language $L(M) = \{w/w \in (0,1)^*\}$ and w does not contains three consecutive 0's.

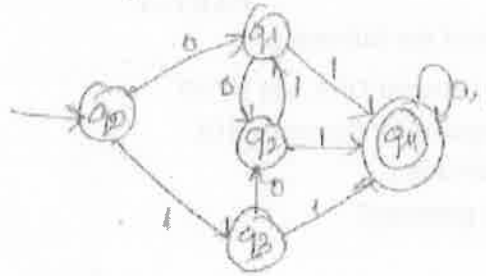
3. Show that following languages are not regular

i) $L = \{a^n b^m \mid n, m \geq 0 \text{ and } n < m\}$

ii) $L = \{a^n b^m \mid n, m \geq 0 \text{ and } n > m\}$

OR

4. Minimize the following



5. Construct NFA for the following

a) $0+10^*+01^*0$

b) $(0+1)^*(01+110)$

OR

6. a) Convert the following right linear to left linear grammar. $S \rightarrow 0A, A \rightarrow 1A, A \rightarrow \epsilon$.

b) Construct PDA for $L = \{a^i b^j c^k \mid i, j \geq 1\}$. Show the moves of the PDA for the string.

7. Define Chomsky normal form, convert the following grammar into CNF:

$$S \rightarrow bA/aB; A \rightarrow bAA/aS/a; \quad B \rightarrow aBB/aBB/bS/S$$

OR

8. Convert the given CFG to CNF $S \rightarrow aSa|bSb|a|b$.

9. a) Design a TM for computing factorial of a given number n .

b) What are the modifications that can be done to the basic model of a TM? Discuss any two in brief.

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, MAY-2018Subject: Design and Analysis Of Algorithms

Branch: Common to CSE & IT (MR13 only)

Time: 3 hours

Max. Marks: 75

PART – A**I. Answer ALL questions of the following****5x1M=5 Marks**

1. Define Algorithm.
2. What is minimal spanning tree?
3. Define Dynamic programming.
4. State the principle of backtracking.
5. Define NP-Hard problem.

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

1. Define space complexity.
2. What is amortized analysis?
3. Explain the general method of divide and conquer.
4. List the drawbacks of merge sort algorithm.
5. Distinguish between greedy method and dynamic programming
6. State the following terms
 - a) balanced tree b) height of a balanced tree
7. Differentiate live node and dead node.
8. What is chromatic number for a graph?
9. Define the term branch and bound.
10. Define deterministic problem.

PART-B**Answer the following questions****5x10M=50 Marks****Q1.** Discuss with examples various asymptotic notations used in algorithm design.**(OR)****Q2.** What is an articulation point? Write an algorithm to eliminate articulation point.**Q3.** Explain with an example how divide and conquer paradigm can be used in binary search for searching an element.**(OR)****Q4.** What is knapsack problem? Find an optimal solution to the knapsack instance $n=3$, $m=20$,
 $(p_1, p_2, p_3) = (25, 24, 15)$ and $(w_1, w_2, w_3) = (18, 15, 10)$ **Q5.** Discuss how dynamic programming can be used in multiplying a chain of matrices.**(OR)****Q6.** Explain in detail about reliability design problem.**Q7.** Explain with an algorithm how backtracking works for solving 8-queens problem.**(OR)****Q8.** What is Hamiltonian cycle? Write a backtracking algorithm that finds all the Hamiltonian cycles in a graph.**Q9.** Explain FIFO branch and bound solution for 0/1 knapsack problem.**(OR)****Q10.** State and prove Cook's theorem. Explain its significance in NP-complete theory.

