

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-2019Subject: Operating Systems

Branch: IT

Time: 3 hours

Max. Marks: 75

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

1. What is a system call?
2. Define frame.
3. What is hold & wait.
4. List file operations.
5. What is logic bomb?

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

1. Define System call. Mention the various system calls.
2. Explain process control block.
3. Explain briefly about external fragmentation.
4. What is a monitor?
5. What is mutual exclusion?
6. List out any four file attributes.
7. Write about single level directory.
8. What is striping?
9. What are the goals of protection?
10. Explain Worms.

PART-B

Answer ALL questions of the following

5x10 Marks= 50Marks

1. a) Define operating system. Explain the various types of OS.
b) Explain OS system structure.

(OR)

2. What is Process Control Block? Explain its structure.
3. Explain how critical section problem is solved using Peterson's solution.

(OR)

4. Explain about segmentation concept in detail.

5. Consider the following scenario for a system there are four types of resources ABCD and consider the following processes is resource allocation

	Allocation				Max				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P0	0	0	1	2	0	0	1	2	1	5	2	0
P1	1	0	0	0	1	7	5	0				
P2	1	3	5	4	2	3	5	6				
P3	0	6	3	2	0	6	5	2				
P4	0	0	1	4	0	6	5	6				

- i) Find whether the system is in safe state.
 ii) Find the need matrix.

(OR)

6. Explain about deadlock prevention in detail.
 7. What are the different file allocation methods? Explain in detail.

(OR)

8. Suppose we have disk with 200 tracks. The disk head starts at track 100 and moving in the direction of decreasing track number. For the following sequence of disk track requests 27, 129, 110, 186, 147, 41, 10, 64, 120. Compute the average seek time for the following disk scheduling algorithms, FIFO, SSTC, SCAN.
 9. Write short notes on :
 a) Goals and principles of protection.
 b) Implementation of Access Matrix.

(OR)

10. a) Explain the major security threats perceived by users and providers of computer based systems.
 b) Discuss the goals of security and protection.

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)
GundlapochampALLy (H), Maisammaguda (V), Medchal (M), Medchal-Malkajiri (Dist), Hyderabad**II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2019**Subject: Formal Languages and Automata Theory

Branch: CSE & IT

Time: 3 hours

Max. Marks: 75

PART - A

I. Answer ALL questions of the following

5x1Mark=5 Marks

1. Define DFA
2. What is the difference between MOORE and MEALY machine?
3. What is purpose of pumping lemma?
4. Write applications of CFG
5. Define NP problems

II. Answer ALL questions of the following

10x2Marks=20 Marks

1. Give DFA accepting the set of all strings with three consecutive 1's, $\Sigma = \{0,1\}$
2. Explain the infinite Automaton model.
3. Write the steps involved in FSM's equivalence.
4. Which one is easy to construct Moore or Mealy machine? Explain.
5. Write the leftmost and rightmost derivation for "aabbaa" for the given CFG.

$$S \rightarrow aAS / a, A \rightarrow sbA / SS/ba$$

6. Consider the grammar with production

$$S \rightarrow aAB$$

$$A \rightarrow bBb$$

$$B \rightarrow AIE$$

Find L.M.D and R.M.D for the string abbbb.

7. Find CFG with no useless symbols equivalent to

$$S \rightarrow AB|CA, B \rightarrow BC|AB, A \rightarrow a, C \rightarrow aB|b$$

8. What are the different ways the PDA can accept strings?

9. Write the mathematical form of TM.

10. Describe church's hypothesis

PART-B

Answer ALL questions of the following

5x10 Marks= 50Marks

1. Design a finite Automata which checks whether a given binary number is divisible by 3.

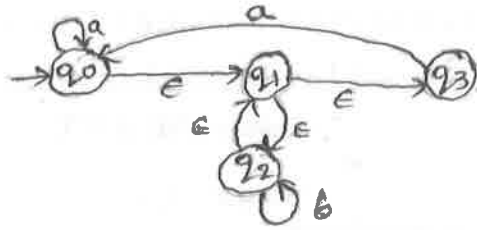
OR

2. Obtain DFAs to accept strings of a's and b's having exactly one a.

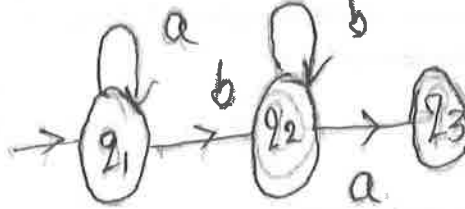
3. Design a FA for all strings All strings that has at least two occurrences of 1 between any two occurrences of 0's.

OR

4. Construct DFA for the NFA- ϵ given below



5. a) Construct the regular expression from given DFA.



- b) Using pumping lemma, prove that $L = \{a^i b^j c^k / i \geq 1\}$ is not a CFL.

OR

6. LET G be a grammar

$S \rightarrow aB / bA$,

$A \rightarrow a/as/bAA$

$B \rightarrow b/bs/aBB$ for the strings aaabbabbba

Find i) L.M.D ii) R.M.D iii) D.T

7. Eliminate the useless symbols from the following grammar

a) $S \rightarrow aA|a|Bb|cC$, $A \rightarrow aB$, $B \rightarrow a|Aa$, $C \rightarrow cCD$, $D \rightarrow ddd$.

b) $S \rightarrow aS|A|C$, $A \rightarrow a$, $B \rightarrow aa$, $C \rightarrow aCb$.

OR

8. Construct PDA for $L = \{w | w \in (a+b)^* \text{ and } n_a(w) > n_b(w)\}$

9. a) Construct a Turing Machine which accepts the language $\{0^n 1^n / \text{where } n > 0\}$

b) Write brief note on Counter machines?

OR

10. Design turing machine to recognize the language $\{0^n 1^n 0^n / n \geq 1\}$