

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: **HUMAN VALUES & PROFESSIONAL ETHICS**

Branch: **COMMON TO EEE,ECE,CSE**

Time: 3 hours

Max. Marks: 60

PART – A

Answer ALL questions of the following

5x2M=10 M

1. What is self-confidence and how it drives an individual towards his/her goal?
2. List out few variety of Moral Issues.
3. 'Sense of humor plays an important role in mental wellbeing and maintaining good human relations of an individual'. Substantiate the statement.
4. What is meant by Humanistic Universal Order?
5. Discuss briefly about respect for authority.

PART-B

Answer ANY FIVE questions of the following

5x10 M= 50M

1. Discuss in detail of the following. a) Integrity b) Work Ethics.
2. a) What happens if an individual loses his integrity?
b) Define moral character.
3. Explain Kohlberg's theory of moral development.
4. In our behavior, we generally observe our intention and others lack of competence. Does it lead to mutual happiness? What is the alternative? Explain with the help of an example.
5. Most precious thing in the world is 'Time'. Substantiate the statement with suitable examples.
6. Discuss the following briefly.
a) Sense of Humour
b) Commitment.
7. Right understanding in the individuals in the individuals is the basis for harmony in the family, and is the building block for harmony in the society. Give your comments.
8. What are the general procedures for implementing the right to due process, differentiate human rights and professional rights?

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Branch: CSE

Time: 3 hours

Max. Marks: 60

PART – A

Answer ALL questions of the following

5x2M=10 M

1. Define probability with examples.
2. Distinguish between Correlation and Regression.
3. Define stochastic process.
4. Explain Arrival and Service processes.
5. Little's Law.

PART-B

Answer ANY FIVE questions of the following

5x10 M= 50M

1. Small cars get better mileage, but they are not as safe as bigger cars. Small cars accounted for 18% of the vehicles on the road, but accidents involving small cars led to 11,898 fatalities during a recent year in a developed country (as reported by a magazine). Assume the probability a small car is involved in an accident is 0.18. The probability of an accident involving a small car leading to a fatality is 0.128 and the probability of an accident not involving a small car leading to a fatality is 0.05. Suppose you learn of an accident involving a fatality. What is the probability a small car was involved? Assume that the likelihood of getting into an accident is independent of car size.
2. a) Three newspapers A, B and C are published in a certain city and a survey shows that for the adult population 20% read A, 16% read B, 14% read C, 8% read both A and B, 5% both A and C, 4% both B and C and 2% read all three. If an adult is chosen at random, find the probabilities that he reads (i) at least one, (ii) none and (iii) exactly one of the three newspapers.
b) In a box, there are 8 red, 7 blue and 6 green balls. One ball is picked up randomly. What is the probability that it is neither red nor green?
3. a) Suppose X and Y are two uncorrelated random variables. Obtain the Mean and Variance of the linear combination of the RVs, $aX+bY$.
b) Suppose the average stock price for companies making up the BSE100 is Rs 1980, and the standard deviation is Rs 540. Assume the stock prices are normally distributed.
i) What is the probability a company will have a stock price of at least Rs 2640?
ii) What is the probability a company will have a stock price no higher than Rs 1320?
iii) How high does a stock price have to be to put a company in the top 10%?
4. a) Calculate regression line Y on X.

X	10	12	13	12	16	15
Y	40	38	43	45	37	43

- b) During a survey conducted recently, it is observed that a worker spends an average of 77 hours logged on to the Internet (Mobile/PC) while at work. Assume the population mean is 77 hours, the times are normally distributed, and that the standard deviation is 20 hours.
- What is the probability that a randomly selected worker spent fewer than 50 hours logged on to the Internet?
 - What percentage of workers spent more than 100 hours logged on to the Internet?
 - A person is classified as a heavy user if he or she is in the upper 20% of usage. How many hours did a worker have to be logged on to the Internet to be considered a heavy user?
5. a) A fair die is tossed repeatedly. If X_n denotes the maximum of the numbers occurring in the first "n" tosses, Find the transition probability matrix P of the Markov chain $\{X_n\}$. Find also P^2 and $P\{X_2=6\}$.
- b) Explain Pure Birth-Death process.
6. The Transition probability matrix of the Markov chain $\{X_n\}$ with $n=1,2,3,\dots$ having three states 1,2,3 is

$$P = \begin{bmatrix} 0.1 & 0.5 & 0.4 \\ 0.6 & 0.2 & 0.2 \\ 0.3 & 0.4 & 0.3 \end{bmatrix}$$

And the initial distribution is $P^{(0)} = (0.7, 0.2, 0.1)$ find:

- (i) $P(X_2=3)$ and (ii) $P(X_3=2, X_2=3, X_1=3, X_0=2)$.
7. a) Retail sales at Heritage's Seafood Supply are handled by one clerk. Customer arrivals are random, and the arrival rate is 21 customers per hour. A study of the service process shows that the service time is 2 minutes per customer, with a standard deviation of $\sigma = 1.2$ minutes. Find the operating characteristics of the queuing model assuming M/G/1 model.
- b) Passengers arrive at a terminal for boarding the next bus. The times of their arrival are Poisson with an average arrival rate of 1 per minute. The times of departure of each bus are Poisson with an average departure rate of 2 per hour. Assume that the capacity of the bus is large. Find the average number of passengers in (i) each bus, and (ii) the first bus that leaves after 9 a.m.
8. a) All airplane passengers at a small Airport must pass through a security screening area before proceeding to the boarding area. The airport has two screening stations available, and the facility manager must decide how many to have opened at any particular time. The service rate for processing passengers at each screening station is 2 passengers per minute. On Monday morning the arrival rate is 5.4 passengers per minute. Assume that processing times at each screening station follow an exponential distribution and that arrivals follow a Poisson distribution. Suppose two screening stations are open on Monday morning. Compute the operating characteristics for the screening facility.
- b) Explain Markovian queues and state any two examples which can be modeled as Markovian queues.

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II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER-2019Subject: **COMPUTER ORGANIZATION**Branch: **CSE****Time: 3 hours****Max. Marks: 60****PART – A****Answer ALL questions of the following****5x2M=10 M**

1. Give any four differences between multi processor systems and multi computer systems.
2. What are different memory referenced instructions?
3. Brief on memory organization.
4. Give any four differences between Isolated Vs Memory mapped I/O.
5. List different types of pipeline.

PART-B**Answer ANY FIVE questions of the following****5x10 M= 50M**

1. a) Explain the interconnection structure between the processor and main memory.
b) Explain about Fixed point and Floating point representations with example.
2. a) Write short notes on ROM.
b) Explain one stage of arithmetic logic shift unit.
3. Show how the operation $K=(X+Y)-Z$ can be implemented in a single accumulator computer by
 - i) Three-address instruction
 - ii) Two-address instruction
 - iii) One-address instruction
 - iv) Zero-address instruction.
4. Explain about program control Instructions.
5. Why do we need subroutine register in a control unit? Explain.
6. What is DMA? Explain DMA Controller.
7. Define pipelining .Explain concept of pipelining with 4 segment pipeline.
8. a) Explain the types of computers.
b) Discuss the types of instruction formats.

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

Subject: **DATABASE MANAGEMENT SYSTEMS**

Branch: CSE

Time: 3 hours

Max. Marks: 60

PART – A

Answer ALL questions of the following

5x2M=10 M

1. Write about database system applications.
2. What is join? Write types of joins.
3. What is a functional dependency?
4. What is a transaction? List the properties of transaction.
5. Write about difference between static hashing and dynamic hashing.

PART-B

Answer any FIVE questions of the following

5x10 M= 50M

1. Explain about different types of database users. Write the functions of DBA.
2. a) Write about features of ER model
b) Attributes and entity sets in E-R model.
3. a) Write advantages of DBMS over file system?
b) Explain in detail about embedded SQL?
4. a) What is meant by Tuple relational calculus? Explain various operations in it.
b) Explain the distinctions among the terms primary key, candidate key and super key.
5. a) Explain in detail about multivalued dependencies with example?
b) Define BCNF. How does it differ from third normal form?
6. Explain about Timestamp-based protocols.
7. a) Discuss two phasing and strict two phase locking protocols.
b) Explain about multiple Granularity.
8. a) Explain the limitations of static hashing. Explain how to overcome those limitations in Dynamic hashing. [6M]
b) Write a note on indexed sequential files. [4M]

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CONTENTS

ORIGINAL ARTICLES

1918-1919

1918-1919

1918-1919

1918-1919

1918-1919

1918-1919

1918-1919

1918-1919

1918-1919

1918-1919

1918-1919

1918-1919

1918-1919

1918-1919

1918-1919

1918-1919

1918-1919

1918-1919

1918-1919

1918-1919

1918-1919

1918-1919

1918-1919

1918-1919

1918-1919

1918-1919

1918-1919

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II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER-2019Subject: **OPERATING SYSTEMS**Branch: **CSE**Time: **3 hours**Max. Marks: **60****PART – A**Answer **ALL** questions of the following**5x2M=10 M**

1. What is meant by System call? Describe the use of fork () and exec () system calls.
2. Define race condition.
3. What are the necessary conditions for deadlocks to occur?
4. Write about "Demand Paging".
5. Define file operations.

PART-BAnswer **ANY FIVE** questions of the following**5x10 M= 50M**

1. a) Explain about Operating system functions.
b) Explain about the system programs.
2. a) Explain about process creation and process termination on process.
b) Write briefly about operating system structure.
3. a) Does an operating system generally need to keep about running processes in order to execute them? Explain in detail.
b) Describe the use of Test (), Set () and swap () functions on synchronization Hardware and how these provide the solution to the critical section problem?
4. Explain about various threading issues.
5. Discuss in detailed about the technique of Deadlock detection (Single instance of each resource type).
b) What is starvation? Illustrate with an example.
6. Consider a system consisting m resources of the same type being shared by n processes. Resources can be requested and released by process only one at a time. Show that the system is deadlock free if the following conditions hold
 - (i) The maximum need of each process is between 1 and m resources.
 - (ii) The sum of maximum need is less than m + n.
7. a) Discuss in detail the performance issues of secondary storage management.
b) Suppose we have files F1 to F4 in sizes of 7178, 572, 499 and 1195 bytes. Our disk has fixed physical block size of 512 bytes for allocation. Explain, how many physical blocks would be needed to store these four files if we were to use a chained allocation strategy assuming that we need 5 bytes of information to determine the next block in the link? (Measured as a percentage of the file size itself).
8. a) Describe how the I/O request transforming into Hardware operations.
b) Demand paging.

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Branch: CSE

Time: 3 hours

Max. Marks: 60

PART – A

Answer ALL questions of the following

5x2M=10 M

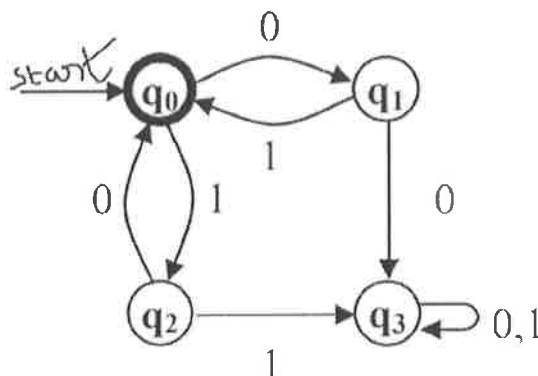
1. Obtain NFA which accepts strings a's and b's starting with the string ab.
2. Define regular expression.
3. Define Greibach Normal Form.
4. Write the differences between Pushdown Automata and Turing Machine.
5. Give examples for Undecidable Problems.

PART-B

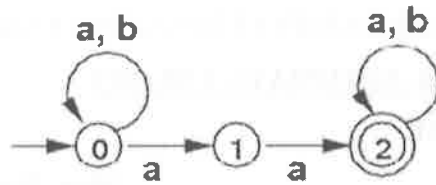
Answer ANY FIVE questions of the following

5x10 M= 50M

1. Construct NFA for $(0 + 1)^*(00 + 11)(0 + 1)^*$ and Convert to DFA.
2. a) Construct DFA that accepts binary equivalent of even numbers and binary equivalent odd numbers
b) Construct DFA that accepts binary equivalent of a numbers that are divisible by 3.
3. Convert the following grammar into CNF.
 $S \rightarrow Aad$
 $A \rightarrow aB \rightarrow bAB$
 $B \rightarrow b$
 $D \rightarrow d$
4. a) Obtain the Regular Expression for the FA shown below.



b) Derive the Left Linear grammar and Right Linear grammar for the Finite Automata



5. a) Write procedure to convert CFG into PDA and also convert the following CFG to PDA.

$S \rightarrow B / aAA$

$A \rightarrow bBB / a$

$B \rightarrow bBB / A$

$C \rightarrow a$

b) Minimize the Context Free Grammar

$S \rightarrow aS / A / C$

$A \rightarrow a$

$B \rightarrow aa$

$C \rightarrow aCb$

6. a) Discuss about Linear Bounded Automata.

b) Construct LR(0) for

$S \rightarrow E$

$E \rightarrow E*B$

$E \rightarrow E+B$

$E \rightarrow id$

7. a) State and Explain about Church's hypothesis.

b) Construct a Turing Machine to accept the language $L = \{1^n 2^n 3^n \mid n \geq 1\}$. Give the transition diagram for Turing Machine obtained and also show the moves made by the Turing machine for the string 111222333.

8. a) Explain Post's Correspondence Problem (PCP) with an example

b) Construct LR(0) for

$A \rightarrow aAa / B$

$B \rightarrow b$