MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
II B.Tech I Semester Regular Examinations, February 2022
Operating Systems
(CSE, CSE-AI&ML, CSE-CS, CSE-DS & CSE-IOT & IT)

Roll No										

Time: 3 hours   **Max. Marks: 70**

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

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SECTION-I

1   With a neat Diagram, Discuss the Architecture of LINUX Operating System? Recall its features?   **[14M]**

OR

2   Define Operating System? Explain various operating System Services with clear examples?   **[14M]**

SECTION-II

3   Discuss in detail about importance of Shells and how they contribute to execute commands? Write a sample shell script to find greatest among three numbers   **[14M]**

OR

4   Consider the following set of processes, with the length of the CPU burst given in milliseconds: **[14M]**

Process	Burst Time	Priority
P1	10	3
P2	1	1
P3	2	4
P4	1	5
P5	5	2

The processes are assumed to have arrived in the order P1, P2, P3, P4, P5, all at time 0. Draw Gantt chart that illustrate the execution of these processes using the non preemptive priority (a smaller priority number implies a higher priority) scheduling algorithm. What is the turnaround time and waiting time of each process?

SECTION-III

5   How Semaphores and Monitors Solve the Synchronization problem. Illustrate them with clear examples.   **[14M]**

OR

6   Consider the following snapshot of a system: **[14M]**

	Allocation	Max	Available
	A B C D	A B C D	A B C D
Po	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	

Apply Banker's Algorithm and determine whether the system is in safe state or not?

7   Define Message Queues? Write the syntax for Creation, Sending and Receiving   **[14M]**
    information by using Message Queues? Discuss with clear examples?

OR

8   Illustrate any three Page Replacement Algorithms with clear examples.   **[14M]**

SECTION-V

9   Discuss any five system calls for file I/O operations with programming examples   **[14M]**

OR

10 What is disk Management? Discuss the Following Disk scheduling Algorithms   **[5M]**
    with suitable examples: **[5M]**
    a)FCFS   **[4M]**
    b)SSTF
    c)SCAN

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MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
II B.Tech I Semester Regular Examinations, February 2022
Data Structures Using Python
(CSE, CSE-AI&ML, CSE-CS, CSE-DS & CSE-IOT & IT)

Roll No										

Time: 3 hours   **Max. Marks: 70**

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SECTION-I

1 What is polymorphism? Explain different types of polymorphisms with clear programming examples **[14M]**

OR

2 Define inheritance. What are the benefits of inheritance? What costs are associated with inheritance? How to prevent a class from inheritance? **[14M]**

SECTION-II

3 Compare and Contrast Linear & Non-Linear Data Structures with illustrative examples **[14M]**

OR

4 What is Dictionary in Python? Classify various types of Comprehensions and its applications in programming **[14M]**

SECTION-III

5 Discuss in detail about Linear and Binary Search algorithms **[14M]**

OR

6 Analyze representation of arrays along with its advantages and disadvantages. Explain matrix multiplication using arrays with an example **[14M]**

SECTION-IV

7 Write an algorithm to insert new node at the beginning, at middle position and at the end of a Singly Linked List. **[14M]**

OR

8 List the applications of stacks and Queues to represent polynomial expressions **[14M]**

SECTION-V

9 Compare and Contrast Weighted Vs Unweighted Graphs? Write the algorithm for Depth First Search with clear example **[14M]**

OR

10 Discuss about Various Tree Traversal Techniques and its implementation details. **[14M]**

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MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
II B.Tech I Semester Regular Examinations, February 2022
Managerial Economics and Financial Analysis
(CSE, CSE-AI&ML, CSE-CS, CSE-DS & CSE-IOT & IT)

Roll No										

Time: 3 hours   **Max. Marks: 70**

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SECTION-I

1 How do you define the micro and macroeconomic concepts and brief on the nature and scope of managerial economics?   **[14M]**

OR

2 Illustrate the law of demand and define demand forecasting, factors governing demand forecasting and brief on the methods of demand forecasting.   **[14M]**

SECTION-II

3 Discuss the form, properties and limitations of Cobb-Douglas production function and brief on economies of scale.   **[14M]**

OR

4 Discuss the importance of Break-even Analysis (BEA) and examine the determination of Break-Even Point and its managerial significance.   **[14M]**

SECTION-III

5 What are the basic features of monopolistic competition, explain the equilibrium of firm and industry in both the short-run and long-run under monopolistic competition?   **[14M]**

OR

6 What are the common features of business organizations and discuss the advantages and limitations of a joint stock company in comparison of other firms of business forms?   **[14M]**

SECTION-IV

7 Examine the need for capital for a business, illustrate the types of capital and methods, sources of raising finance for a business form.   **[14M]**

OR

8 Explain the proformas of trading account, profit and loss account and balance sheet with appropriate proformas.   **[14M]**

SECTION-V

9 XYZ Co.Ltd.is proposing to undertake one project. Two projects A and B are available. The initial cost of the Project in each case is Rs. 40,000/-.A discount factor of 10% is used to compare the projects .Cash flows after taxes as follows   **[14M]**

Year	Cash flows after taxes (in Rs.)	
	Project 'A'	**Project 'B'**
1	15,000	5,000
2	20,000	15,000
3	25,000	20,000
4	15,000	30,000
5	10,000	20,000

Which one do you recommend under Net Present Value Index method? And why

10 ABC company Ltd provides you following balance sheet on 31st March 2021:(in Rs)   **[14M]**

Libailities	Amount	Assets	Amount
Equity shar capital @Rs 100	5,00,000	Fixed assets	4,00,000
General Reserve	50,000	Inventories	1,00,000
8% Debentures	1,00,000	Sundry Debtors	80,000
Sundry creditors	30,000	Rent receivable	20,000
Bills payable	40,000	Cash and bank	1,20,000
Outstanding interest	8,000	Prepaid expenses	20,000
Retained earing	22,000	Preliminary expenses	10,000
	7,50,000		**7,50,000**

Additional Information:

Sales during the year Rs. 14,00,000

Gross profit 40% of sales

Net profit after tax Rs. 1,50,000

Opening inventory Rs 68,000

Your required to calculate :

1. Current ratio; 2. Quick Ratio; 3. Debt equity Ratio;   4. Fixed assets turnover ratio

5. Stock turnover ratio.

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Operating Systems
(CSE, CSE-AI&ML, CSE-CS, CSE-DS & CSE-IOT & IT)

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<div align="center">OR</div>

8   Illustrate any three Page Replacement Algorithms with clear examples.   **[14M]**

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9   Discuss any five system calls for file I/O operations with programming examples   **[14M]**

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          with suitable examples: **[5M]**
          a)FCFS   **[4M]**
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          c)SCAN

<div align="center">**********</div>

Code No: **R20A0024**

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
II B.Tech I Semester Regular Examinations, February 2022
Probability and Statistics
(CSE, CSE-AI&ML, CSE-CS, CSE-DS & CSE-IOT & IT)

Roll No										

Time: 3 hours   **Max. Marks: 70**

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SECTION-I

1 **a)** A random variable X has the following probability function: **[7M]**

X: 0   1   2   3   4   5   6   7
P(X):   0   k   2k   2k   3k k^2 $2k^2$ $7k^2+k$

Find (i) the value of k   (ii) P(X < 6), P(X ≥ 6), (iii) P(0 < X< 5).

   b) A random variable gives measurements X between 0 and 1 with a   **[7M]**
   probability function
   $f(x) = 12x^3-21x^2+10x$, $0 \le x \le 1$.
   Find a number k such that $P(X \le k) = \frac{1}{2}$.

OR

2 **a)** Find the standard deviation for the following discrete distribution: **[7M]**
   X: 8   12   16   20   24
   P(X):   1/8   1/6   3/8   1/4   1/12

   b) If $f(x) = \begin{cases} (x+1)/2, & -1<x<1 \\ 0, & \text{elsewhere} \end{cases}$ **[7M]**

   Represents the density of a random variable X, find E(X) and Var (X).

SECTION-II

3 **a)** In 256 sets of 12 tosses of a coin, in how many cases one can expect 8   **[7M]**
   heads and 4 tails.

   b) Determine the binomial distribution for which mean is twice the variance   **[7M]**
   and sum of mean and variance is 3. Also find $P(X \le 3)$.

OR

4 In a normal distribution, 31% of the items are under 45 and 8% ae over 64. Find   **[14M]**
   the mean and S.D. of the distribution.

SECTION-III

5 **a)** Ten participants in a contest are ranked by two judges as follows: **[7M]**
   x: 1   6   5   10   3   2   4   9   7   8
   y: 6   4   9   8   1   2   3   10   5   7
   Calculate the rank correlation coefficient

   b) Find the correlation coefficient between x and y from the given data: **[7M]**
   x: 78   89   97   69   59   79   68   57
   y: 125   137   156   112   107   138   123   108

6   Find two lines of regression and coefficient of correlation for the data **[14M]** given below: n = 18, $\sum x = 12$, $\sum y = 18$, $\sum x^2 = 60$, $\sum y^2 = 96$, $\sum xy = 48$.

SECTION-IV

7   **a)** Explain type-I and type-II errors   **[7M]**

     b) The mean and Standard deviation of a Sample are 11795 and 14054   **[7M]** respectively. If $n = 50$; Find the 95% Confidence interval for the Population means

OR

8   **a)** Explain types of sampling   **[7M]**

     b) Random samples of 400 men and 600 women were asked whether they   **[7M]** would like to have a flyover near their residence. 200 men and 325 women were in favour of the proposal. Test the hypothesis that proportions of men and women in favour of the proposal, are same against that they are not at 5% level.

SECTION-V

9   **a)** Explain test for single mean in small samples   **[7M]**

     b) In one sample of 8 observations, the sum of the squares of deviations of the   **[7M]** sample values from the sample mean was 84.4 and in the other sample of 10 observations it was 102.6. Test whether this difference is significant at 5 percent level, given that the 5 percent point of F for $n_1 = 7$ and $n_2 = 9$ degrees of freedom is 3.29.

OR

10   Fit the Poisson distribution for the data and test for goodness of fit at 5%.   **[14M]**

No. of accidents:	0	1	2	3	4	5	6
No. of days:	160	65	45	34	10	6	2

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II B.Tech I Semester Regular Examinations, February 2022
Computer Organization
(CSE, CSE-AI&ML, CSE-CS, CSE-DS)

Roll No

Time: 3 hours   **Max. Marks: 70**

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***

SECTION-I

1	Explain different functional units of a digital computer with neat sketch. Recall the usage of Signed number representations	**[14M]**

OR

2	Recall the Multiplication algorithms used in Computer Arithmetic. Convert the following binary number into decimal & octal number: i) (00010.110)2 ii) (000.10110)2	**[14M]**

SECTION-II

3	List and explain the steps involved in the execution of a complete instruction cycle. List the basic symbols used in register transfer Language	**[14M]**

OR

4	Classify different Types of Instructions used in Computer Organization with an example.	**[14M]**

SECTION-III

5	Explain direct and immediate addressing Modes. Differentiate CISC and RISC processors	**[14M]**

OR

6	Illustrate the micro-programmed control unit(MCU) with a neat diagram and how instructions will be processed in MCU?	**[14M]**

SECTION-IV

7	Draw a neat block diagram of memory hierarchy in a computer system. Compare the parameters size, speed and cost per bit in the hierarchy.	**[14M]**

OR

8	Explain the following mapping techniques used for cache mapping i) Associative mapping ii)Direct mapping iii) set-associative mapping cache	**[14M]**

SECTION-V

9	Write a short notes on Peripheral devices .With a neat sketch explain the working principle of DMA	**[14M]**

OR

10	Discuss with neat diagrams, How Hazards improved in Pipelining.	**[14M]**

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