OEMT112

Reg. No. ☐☐☐☐☐☐☐☐☐

I Semester B.Sc. Degree Examination, May/June - 2022

CORPORATE MATHEMATICS

(NEP Scheme 2021-2022 and Onwards) (Open Elective)

Paper : I

Time : 2½ Hours　　　　　　　　　　　　　　　　　**Maximum Marks : 60**

Instructions to Candidates:

　　Answer **All** the questions.

I.　Answer any **Six**.　　　　　　　　　　　　　　　　　　　　　　**(6×2=12)**

1.　Solve for $x : \dfrac{x}{2} + \dfrac{2x}{3} = \dfrac{7}{2}$.

2.　Sum of two consecutive integers is 39. Find the numbers.

3.　Factorize : $x^2 - 3x - 4 = 0$.

4.　Solve : $x - y = 2$, $2x + y = 4$ by substitution method.

5.　Explain with example cumulative frequency.

6.　Define Arithmetic mean of a set of observations and mention two of its merits.

7.　Find the median for the following data 5, 9, 8, 6, 1, 4, 10, 8.

8.　If mean and coefficient of variation of a distribution are 56 and 75% respectively. Find the standard deviation.

9.　What is Histogram? Mention its significance.

10.　Define linear programming problem.

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II.   Answer any Three.   (3×4=12)

11.   Solve for $x : \dfrac{x+3}{x+7} = \dfrac{x-4}{x-2}$.

12.   Solve for x and y by Rule of cross Multiplication (RCM) :

$$5x + 2y = 8$$
$$9x - 5y = 23$$

13.   Solve for x using Sridharacharya method $8x^2 - 22x - 21 = 0$.

14.   Following are the marks obtained by the students in a certain test. Prepare a frequency distribution with an interval 10 marks each as [10-19], [20-29], ..., [60-69].

37, 49, 54, 51, 37, 15, 12, 33, 23, 25

18, 35, 33, 42, 45, 55, 69, 63, 46, 29

18, 37, 46, 59, 29, 35, 27, 45, 47, 65.

15.   A company produces two articles A and B. There are two departments through which it passes, the maximum potential capacity of the assembly is 60 hours and finishing department is 48 hours. Production of one unit of A requires 4 hours assembly and 2 hours in finishing. Each unit of B requires 2 hours of assembly and 4 hours in finishing. If the profit is Rs. 80 for A and Rs. 60 For B, formulate LPP to maximize the profit.

16.   Draw a multiple bar diagram for the following data

Religion	Population	(millions)
	1971	1981
Hindu	82.7	82.6
Muslim	11.2	11.4
Christian	2.6	2.4
Others	3.5	3.6

III. Answer any Six.

17. A boatsman goes 96 kms in 8 hours with the flow of a river and return in 12 hours against the flow. Find the speed of the boat and the river.

18. Solve the resulting quadratic equation using formula, $\dfrac{x+8}{3x-5} = \dfrac{x-8}{x+5}$.

19. A train travels a distance of 300 kms, at a constant speed. If the speed of the train is increased by 5 km/hr, the journey would have taken 2 hours less. Find the speed of the train.

20. A board of 65 inches long is cut into two pieces. The smaller piece in 1 inch longer than one - third the length of the larger piece. Find the length of the two pieces.

21. Solve the following LPP by graphical method

    Maximize : $z = 3x + 4y$,

    Subject to the constraints, $x + 2y \leq 10$, $x + y \leq 6$, $x \geq 0, y \geq 0$.

22. Solve the following LPP by the graphical method.

    Minimize : $z = 3000x + 2000y$

    Subject to the constrains,

    $12x + 4y \geq 48$

    $4x + 4y \geq 32$

    $8x + 16y \geq 80$

    $x \geq 0, y \geq 0$.

23. Draw a pie chart for the following data

Item of Expenditure	Amount spent (in Rs.)
Food	3750
Health	1875
Clothing	1875
Education	1200

24. Calculate the mode for the following frequency distribution table.

Income(Rs.)	1000-2000	2000-3000	3000-4000	4000-5000	5000-6000	6000-7000
No. of Workers	15	18	30	17	18	22

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25. Calculate coefficient of Mean deviation (MD) from median for the following frequency distribution table.

x	5	6	7	8	9	10
f	8	12	18	8	2	1

26. Goals scored by two teams A and B in football season are as follows,

No. of goals	No. of Matches	
	Team A	Team B
0	22	11
1	8	10
2	7	8
3	8	7
4	3	4