

BENGALURU CITY UNIVERSITY

I SEM B.SC MATHEMATICS(OPEN ELECTIVE)

CORPORATE MATHEMATICS

MODEL PAPER-III (2021-22 onwards) NEP

Time : 3 hours

Total Marks : 60

I Answer any SIX

(6x2=12)

1. Solve $4(x - 6) = 9 + 2(x - 7)$ for x.
2. Define a quadratic equation and also mention two methods of solving it.
3. Factorize $x^2 + 5x + 6 = 0$
4. Solve $x - 2y = 4$, $x + 7y = 6$ by substitution method.
5. What are univariate and bivariate frequency distribution?
6. Define Arithmetic mean of a set of observations and mention two of its merits.
7. For the following data, calculate the coefficient of range 25, 18, 40, 22, 30, 15.
8. Find the combined mean, given $\bar{X}_1 = 25$, $\bar{X}_2 = 40$, $n_1 = 20$, and $n_2 = 10$.
9. What is Data interpretation and mention its types.
10. Define optimal value of an objective function.

II Answer any THREE

3x4=12

11. Solve for x: $\frac{3}{x-6} + \frac{7}{x-2} = \frac{10}{x-4}$

12. Solve for x and y by elimination method:

$$\frac{4}{x} + \frac{10}{y} - 2 = 0$$
$$\frac{3}{x} + \frac{12}{y} - \frac{19}{20} = 0$$

13. Solve for x using formula: $x + \frac{1}{x} = 3 \frac{11}{4}$

14. The following are the weights of 30 students. Draw up a frequency distribution with class intervals of width 6 Kgs

Weight(Kgs): 51, 47, 50, 54, 62, 52, 42, 49, 52, 49, 44, 50, 53, 58, 46, 50, 51, 53, 48, 50, 55, 52, 55, 58, 63, 54, 52, 49, 50, 58.

15. Draw the inequalities $x+y \leq 1$ and $x \geq 4$ graphically.

16. Draw the bar graphs for the population of two states over the years given below.

Year	Population (in Lakh)	
	A	B
2001	48	50
2002	58	63
2003	60	60
2004	65	45
2005	49	70
2006	68	80
2007	80	100

III Answer any SIX

(6x6=36)

17. Three years hence a father will be three times as old as his son, 5 years ago his age was 6 years more than 4 times that of the son. Find their ages now.

18. Solve for x: $3(x-3)(x+4) + 3(x-2)(x-4) = 19(x-4)(x-3)$

19. A student starts for a hostel 24 km away from his house on cycle. If he increases his speed by 2 km/hr he reaches 2 hours early. Find out his speed in km/hr

20. Find the fraction which is equal to $\frac{1}{2}$ when both its numerator and denominator are increased by 1 and which is equal to $\frac{2}{3}$ when both are increased by 4.

21. X Breweries Ltd have two bottling plants one located at G and other at J. Each plant produces three beverages named A, B and C. The number of the bottles produced per day are as follows,

Beverages	G	J
A	1500	1500
B	3000	1000
C	2000	5000

A market survey indicates that during the month of July, there will be a demand of 20,000 bottles of A, 40,000 bottles of B and 44,000 bottles of C. The operating cost per day for plants at G and J are 600 and 400

monetary units. For how many days each plant be run in July so as to minimize the production of cost, while still meeting the market demand? Solve graphically.

22. Solve the following LPP by the graphic method

$$\text{Maximize } z = 5x_1 + 7x_2$$

$$x_1 + x_2 \leq 4$$

$$3x_1 + 8x_2 \leq 24$$

$$10x_1 + 7x_2 \leq 35$$

$$x_1, x_2 \geq 0$$

23. Following is the data regarding strength of a college. Draw a multiple bar diagram

Faculty	Student Strength		
	2011	2012	2013
Arts	120	130	150
Science	180	250	280
Commerce	150	175	200

24. Calculate Variance and standard deviation for the following data:

C-I	0-5	5-10	10-15	15-20	20-25
f	20	25	32	28	18

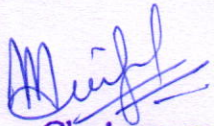
25. Calculate the Harmonic mean for the following data

14, 22, 9, 15, 20, 17, 12, 11

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

No. of goals(x)	No. of matches	
	Team A	Team B
0	22	11
1	8	10
2	7	8
3	8	7
4	3	4

Find which team is more consistent in scoring.


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