BENGALURU CITY UNIVERSITY

I SEM B.SC MATHEMATICS(OPEN ELECTIVE)

CORPORATE MATHEMATICS

MODEL PAPER-II(2021-22 onwards) NEP

Time : 3 hours **Total marks : 60**

I Answer any SIX (6x2=12)

1. Solve $\frac{3x-1}{2} = \frac{2x+1}{3}$ for x.
2. What are simultaneous equations? Mention any two methods of solving them.
3. Factorize $x^2+4x-12=0$
4. Write the steps involved in RCM to solve the equations $a_1x+b_1y+c_1=0$, $a_2x+b_2y+c_2=0$
5. Define discrete and continuous frequency distributions.
6. What is an open end class? Give an example.
7. Define Arithmetic mean of a set of observations and mention two of its merits.
8. Find the median for the following data 5, 9, 8, 6, 1, 4, 10, 8.
9. If mean and C.V. of a distribution are 56 and 75% respectively. Find the SD.
10. Mention any two demerits of graphical presentation of the data.

II Answer any THREE (3x4=12)

11. Solve for x: $\frac{1}{x+1}+\frac{3}{x+4}=\frac{4}{x+3}$
12. Solve for x and y by substitution method: $2x-5y+8=0,\ x-4y+7=0$
13. Solve for x using Sridharacharya method $5x^2+8=13x$
14. A psychologist estimates the Intelligence Quotient (IQ) of 28 students. The values are as follows,
    103, 86, 94, 97, 100, 114, 102, 76, 95, 98, 101, 99, 83, 94, 64, 78, 122, 105, 115, 68, 84, 90, 100, 96, 98, 78, 96, 79.
    Form a frequency distribution with class intervals of width 5.
15. The food stuffs A and B have 3 vitamins V_1, V_2, V_3 as follows

Food Stuff	V_1(mg)	V_2(mg)	V_3(mg)
A	1	100	10
B	1	10	100

Minimum daily requirements of these vitamins are 1mg, 50mg and 10mg. The cost of food stuff A is Rs 2 and that of B is Rs 3. Formulate the linear programming problem (LPP) to find the minimum cost of the diet that would supply the body at least minimum requirements of each vitamin.

16. Draw a pie chart for the following data:

Item of expenditure	Amount spent(in rupees)
Food	3750
Health	1875
Clothing	1875
Education	1200

III Answer any SIX **6x6=36**

17. A boatsman goes 96 kms in 8 hours with the flow of a river and returns in 12 hours against the flow. Find the speed of the boat and the river.
18. Solve for x : $\frac{2x+5}{x+2}+\frac{2x-5}{x-2}=\frac{4x-5}{x-1}$
19. Mr. X bought a certain number of shirts for Rs 750, each shirt costing the same. He sold each shirt at Rs 42, with the total sales proceeds he could buy 10 more shirts than before. Obtain the quadratic equation to find the number of shirts he brought originally.
20. A board of 65 inches long is cut into two pieces. The smaller piece is 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 $z = 5x+3y$

$3x+5y \leq 15$

$5x+2y \leq 10$ $\quad x,y \geq 0$

22. Reshma wishes to mix two types of food P and Q in such a way that the vitamin contents of the mixture contain atleast 8 units of vitamin A and 11 units of vitamin B. Food P costs Rs. 60 per kg and food Q costs Rs 80 per kg. Food P contains 3 units per kg of vitamin A and 5 units per kg of vitamin B, while food Q contains 4 units per kg of vitamin A and 2 units per kg of vitamin B. Determine the minimum cost of the mixture.

23. Draw the line graph for the data relating to foreign trade of India during the years:

Year	Exports(Rs in crore)	Imports(Rs in crore)
1991-1992	3300	2000
1992-1993	4000	2500
1993-1994	5700	2800
1994-1995	6300	3000
1995-1996	6700	3500
1996-1997	6000	3800
1997-1998	6500	4000

24. Calculate M.D. from median and its relative measure for the following data: 37, 45, 52, 46, 56, 40, 47, 55, 43

25. Calculate mode for the following frequency distribution:

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

26. Calculate CV for the following frequency distribution

No. of goals in a match(x)	0	1	2	3	4
Team	22	8	7	8	3

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