

FOURTHSEMESTER B.Com. DEGREE EXAMINATION, APRIL 2024

(Regular/Improvement/Supplementary)

FINANCE AND COMPUTER APPLICATION

GBCM4C04T: QUANTITATIVE TECHNIQUES FOR BUSINESS

Time:2 ½ Hours

MaximumMarks: 80

SECTION A: Answer the following questions. Each carries *two* marks.

(Ceiling 25 Marks)

1. Mention any four statistical techniques for quantitative analysis.
2. What are the different methods of measuring correlation?
3. From the following values of X and Y find coefficient of correlation:

| | | | | | |
|-----|---|---|---|---|---|
| X : | 2 | 3 | 5 | 6 | 7 |
| Y : | 1 | 2 | 4 | 5 | 8 |

4. Give any two properties of regression coefficients.
5. Given the regression lines to be $2x + 18y = 326$ and $x + 2y = 33$. Find mean of x and y.
6. What is an empty set? Give an example.
7. Of 150 patients examined at a clinic, it was found that 90 had heart troubles, 50 had diabetes and 30 had both diseases. What percentage of patients had either heart trouble or diabetes?
8. If A and B are two events such that $P(A) = 1/3$, $P(B) = 1/4$ and $P(A \cap B) = 1/8$. Find $P(A|B)$ and $P(A|B^c)$.
9. A binomial distribution has $n = 90$, $p = 0.3$. Find its mean and variance.
10. The incidence of occupational disease in an industry is such that the workman has 25% chance of suffering from it. What is the probability that out of six workmen 4 or more will contract the disease?
11. The height of school children of one institution is normally distributed with mean of 54 inches and SD of 12 inches. What percentage of students have between 46 and 56 inches height?
12. Write any four properties of Normal distribution.
13. What do you understand by decision theory?

(PTO)

14. Given below is a payoff table. From it form an opportunity loss table.

| | Acts | | |
|-----------------|----------------|----------------|----------------|
| State-of-nature | A ₁ | A ₂ | A ₃ |
| E ₁ | 167 | 150 | 148 |
| E ₂ | 156 | 158 | 159 |
| E ₃ | 156 | 158 | 160 |

15. Explain the various steps involved in solving LPP by graphic method.

SECTION B: Answer the following questions. Each carries five marks.

(Ceiling 35 Marks)

16. What are the common techniques of operations research? Explain.

17. What are the business applications of quantitative techniques?

18. Obtain the equation of the lines of regression for the data given below :

| | | | | | | | | | |
|-----|---|---|----|----|----|----|----|----|----|
| X : | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Y : | 9 | 8 | 10 | 12 | 11 | 13 | 14 | 16 | 15 |

19. Explain the main differences between regression and correlation analysis.

20. If $P(A) = 0.39$, $P(B) = 0.21$ and $P(A \text{ or } B) = 0.47$. Find the probability that

(a) Neither A nor B will occur.

(b) Both A and B will occur.

(c) Neither A will occur.

21. A box contains 100 machine parts of the same type. Out of this 20 are defective; 10 are selected for inspection. Indicate what is the probability that (a) All 10 are defective (b) All 10 are good (c) At least one is defective (d) At the most 3 are defective.

22. If X is normally distributed with mean 11 and standard deviation 1.5, find the number K such that (i) $P(X > K) = 0.3$ (ii) $P(X < K) = 0.09$

23. Find EMV for all the A₁, A₂, A₃ acts from the table given below.

Which is the optimal act?

| Strategies (Acts) | Events | | |
|-------------------|----------------|----------------|----------------|
| | S ₁ | S ₂ | S ₃ |
| A ₁ | 2 | 8 | 15 |
| A ₂ | -3 | 10 | 20 |
| A ₃ | -10 | 20 | 35 |

$$P(S_1) = 0.4, P(S_2) = 0.3 \text{ and } P(S_3) = 0.3$$

SECTION C: Answer any two question. Each carries ten marks.

24. Assume that a factory has two machines. Past records show that machine I produces 30% of the items of output and machine II 70% of the items of output. Further, 5% of the items produced by machine I were defective and only 1% produced by machine II were defective. If a defective item is drawn at random, what is the probability that the defective item was produced by machine I?
25. Calculate Karl Pearson's coefficient of correlation between age and playing habits for the following data;

| | | | | | | |
|-------------------|-----|-----|-----|-----|-----|-----|
| Age: | 20 | 21 | 22 | 23 | 24 | 25 |
| No. of students : | 500 | 400 | 300 | 240 | 200 | 160 |
| Regular players : | 400 | 300 | 180 | 96 | 60 | 24 |

26. Fit a Poisson distribution to the following data and calculate theoretical frequencies:

| | | | | | | | |
|-----|----|----|----|----|---|---|---|
| x : | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| f : | 98 | 69 | 26 | 12 | 6 | 3 | 1 |

27. Solve the following problem graphically.

$$\text{Maximize } Z = 60x_1 + 40x_2$$

$$\text{Subject to } 2x_1 + x_2 \leq 60$$

$$x_1 \leq 25$$

$$x_2 \leq 35$$

$$x_1 \geq 0, x_2 \geq 0$$

(2x 10 = 20 Marks)