(i) **Printed Pages: 4** **Roll No. .....**

(ii) **Questions : 14** **Sub. Code :** 0828

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Bachelor of Commerce 4th Semester

(2042)

QUANTITATIVE TECHNIQUES AND METHODS

Paper : BCM-406

Time Allowed : Three Hours] **[Maximum Marks : 80**

SECTION—A

Note :— Attempt any **FOUR**.

1. What do you mean by Quantitative Techniques ? Discuss its important functions. 5

2. The mean and variance of a binomial distribution are 3 and 2 respectively. Find the probability that the variable takes values : (i) less than or equal to 2 (ii) greater than or equal to 7. 5

3. Define and explain :

   (i) Constraints

   (ii) Optimum solution

   (iii) Feasible Region. 5

4. Interpolate the missing values from the following data : 5

Year	1985	1990	1995	2000	2005	2010
Value	40	49	?	52	?	62

5. Calculate coefficient of correlation between birth rate and death rate from the following data :

Year	1931	1941	1951	1961	1971	1981	1991
Birth Rate	24	26	32	33	35	30	32
Death Rate	15	20	22	24	27	24	20

5

6. The lines of regression of Y on X and X on Y are respectively

$Y = X + 5$ and $16X - 9Y = 94$.

Find the variance of X if the variance of Y is 16. 5

SECTION—B

Note :— Attempt any **TWO**.

7. (a) Four persons are chosen at random from a group containing 3 men, 2 women and 4 children. Find the chance that exactly one of them will be children.

(b) Two balls are to be drawn one after another from an urn containing 6 white and 4 black balls. Determine the probability that both balls drawn are black if the ball selected on the first drawn is : (i) placed back into the urn, (ii) not placed back into the urn. 5,5,5

8. Using Poisson law of distribution, find a test for goodness of fit for the following data :

No. of ignition (K)	0	1	2	3	4	5	6
No. of days with K ignitions	75	90	54	22	6	2	1

15

9. What is normal distribution ? Discuss its properties. Bring out its importance in statistics. 15

10. Draw the graph of the following inequalities :

$$X + 2Y \leq 8, \quad 3X + Y \leq 12, \quad X + Y \leq 5$$

and $X \geq 0$ and $Y \geq 0$.

Also indicate the common region. 15

SECTION—C

Note :— Attempt any **TWO**.

11. The following table shows the output and input related to a certain product. Interpolate the input for output at 42.

Output	40	50	60	70
Input	6.2	7.2	9.1	12.0

15

12. The following table gives the distribution of items and relatively defective items among them according to size groups :

Size group	15–16	16–17	17–18	18–19	19–20	20–21
No. of items	180	250	320	340	380	280
Defective items	130	142	150	160	160	104

15

13. Following information regarding X and Y variables is given :

$N = 10$, $\Sigma X = 320$, $\Sigma Y = 380$, $\Sigma(X - 32)^2 = 140$,

$\Sigma(Y - 38)^2 = 398$, $\Sigma(X - 32)(Y - 38) = -93$.

Calculate :—

(i) Regression co-efficients,

(ii) The two regression equations, and

(iii) Coefficient of correlation. 6,6,3

14. Write notes on the following :—

(a) Explain the usefulness of interpolation and extrapolation in business.

(b) Explain the properties of correlation coefficient.

(c) What is the relationship between correlation and regression coefficients ? 5,5,5