

Code No. : 12087 E Sub. Code : CMCO 41

B.Com. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2023.

Fourth Semester

Commerce — Core

## QUANTITATIVE TECHNIQUES

(For those who joined in July 2021-2022)

Time : Three hours Maximum : 75 marks

## PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. The area of triangle formed by the points  $(-5, 0)$ ,  $(0, -5)$  and  $(5, 0)$  is
- (a) 0 sq. units (b) 25 sq. units  
(c) 5 sq. units (d) none of these

6. What were the first two results of a central tendency test?
- (a) Mean and Mode  
(b) Median and Mode  
(c) Mean, Median and Range  
(d) None of the above
7. Which of the following is true for the coefficient of correlation?
- (a) The coefficient of correlation is not dependent on the change of scale  
(b) The coefficient of correlation is not dependent on the change of origin  
(c) The coefficient of correlation is not dependent on both the change of scale and change of origin  
(d) None of the above
8. Which of the following statements is true about the arithmetic mean of two regression coefficients?
- (a) It is less than the correlation coefficient  
(b) It is equal to the correlation coefficient  
(c) It is greater than or equal to the correlation coefficient  
(d) It is greater than the correlation coefficient

2. A man walks near a wall, such that the distance between him and the wall is 10 units. Consider the wall to be the Y axis. The path travelled by the man is
- (a)  $x = 10$  (b)  $y = 10$   
(c)  $x = 0$  (d)  $y = 0$
3. Total number of possible matrices of order  $3 \times 3$  with each entry 2 or 0 is
- (a) 9 (b) 27  
(c) 81 (d) 512
4. If  $A$  and  $B$  are two matrices of the order  $3 \times m$  and  $3 \times n$ , respectively, and  $m = n$ , then the order of matrix  $(5A - 2B)$  is
- (a)  $m \times 3$  (b)  $3 \times 3$   
(c)  $m \times n$  (d)  $3 \times n$
5. When the values in a series do not have equal importance, we calculate the
- (a) Mode (b) Weighted mean  
(c) Arithmetic mean (d) None of the above

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9. Index number for the base year is always
- (a) 100 (b) 101  
(c) 111 (d) 112
10. Index number is a type of
- (a) Dispersion (b) Correlation  
(c) Average (d) None of the above

## PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) For each part below, find an equation of a line satisfying the requirements. Through the two points  $(0, 3)$  and  $(-2, -4)$ .
- Or
- (b) How do you write an equation in standard form if the line passes through  $(1, 2)$ , slope = 7?
12. (a) Find the determinant of matrix  $A = \begin{bmatrix} 4 & 2 \\ 3 & 2 \end{bmatrix}$ .
- Or
- (b) If  $A = \begin{bmatrix} 1 & 2 \\ 2 & 1 \end{bmatrix}$  and  $B = \begin{bmatrix} 2 & 1 \\ 1 & 2 \end{bmatrix}$ , find  $A(BA)$ .

13. (a) Calculate the geometric mean of the annual percentage growth rate of profits in business corporate from the year 2000 to 2005 is given below : 50, 72, 54, 82, 93.

Or

- (b) The population in a city increased at the rate of 15% and 25% for two successive years. In the next year it decreased at the rate of 5%. Find the average rate of growth: (Let us assume that the population is 100).

14. (a) Calculate the correlation co-efficient for the following data:

X	5	10	5	11	12	4	3	2	7	1
Y	1	6	2	8	5	1	4	6	5	2

Or

- (b) The following data give the height in inches (X) and the weight in IB. (Y) of a random sample of 10 students from a large group of students of age 17 years:

X	61	68	68	64	65	70	63	62	64	67
Y	112	123	130	115	110	125	100	113	116	125

Estimate Weight of the students of a height 69 inches.

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15. (a) The wholesale price index numbers for the year 2014 and 2015 are found to be 177.6 and 181.2 respectively. Find the rate of inflation using index numbers of both the years.

Or

- (b) The cost of living index number increased from 280 to 340 during a certain time period and the wage increased from 13500 to 14750. Find the real gain or loss of the worker.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Find the equation of the straight line passing through the intersection of  $4x - 3y - 1 = 0$  and  $2x - 5y + 3 = 0$  and perpendicular to  $2x + 3y = 12$ .

Or

- (b) Find the distance between two points A and B such that the coordinates of A and B are (5, -3) and (2, 1).

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17. (a) Let  $A = \begin{bmatrix} 1 & 2 \\ 3 & 1 \end{bmatrix}$ ,  $B = \begin{bmatrix} 1 & 4 \\ 3 & -1 \end{bmatrix}$ , Calculate  $A + B$ .

Or

- (b) Find the transpose for the given 2×2 matrix,  
 $X = \begin{bmatrix} 7 & 11 \\ 21 & 16 \end{bmatrix}$ .

18. (a) Compute  $Q_1$  and  $Q_3$  for the data relating to the marks of 8 students in an examination given below 25, 48, 32, 52, 21, 64, 29, 57.

Or

- (b) Compute  $Q_1$  and  $Q_3$  for the data relating to age in years of 543 members in a village :

Age in years	20	30	40	50	60	70	80
No. of members	3	61	132	153	140	51	3

19. (a) Calculate coefficient of correlation from the following data:

X	12	9	8	10	11	13	7
Y	14	8	6	9	11	12	3

Or

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- (b) The following data relate to advertisement expenditure (in lakh of rupees) and their corresponding sales (in crores of rupees).

X	40	50	38	60	65	50	35
Y	38	60	55	70	60	48	30

Estimate the sales corresponding to advertising expenditure of Rs. 30 lakhs.

20. (a) Construct the Price Index Number for the year 1997, from the following information taking 1996 as base year.

Commodities	Price in 1996 (Rs.)	Price in 1997 (Rs.)
Rice	130	115
Wheat	80	65
Sugar	75	70
Ragi	95	90
Oil	105	105
Dal	35	20

Or

- (b) Calculate three-yearly moving averages of number of students studying in a higher secondary school in a particular village from the following data.

Year	1995	1996	1997	1998	1999
Number of students	332	317	357	392	402
Year	2000	2001	2002	2003	2004
Number of students	405	410	427	435	438

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