

(8 pages)

Reg. No. : .....

Code No. : 5736

Sub. Code : PESM 13

M.A. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2017.

First Semester

Economics

STATISTICAL METHODS FOR ECONOMICS — I

(For those who joined in July 2017 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Correlation coefficient value lies between  
(a) -1 and +1                      (b) 0 and 1  
(c) -1 and 0                        (d) none of these
2. If  $\gamma_{XY} = -0.84$ , then  $\gamma_{YX} = ?$   
(a) -0.84                            (b) +0.84  
(c) 0.42                              (d) none of these

3. Regression line always passes through  
(a)  $X, Y$                             (b)  $(\bar{X}, \bar{Y})$   
(c)  $(\bar{X}, Y)$                         (d)  $(\bar{Y}, X)$
4. If the scatter diagram is drawn the scatter points lie on a straight line then it indicate  
(a) no correlation                  (b) less correlation  
(c) perfect correlation              (d) none of the above
5. In five series seasonal variation can occur within a period of  
(a) 4 years                            (b) 3 years  
(c) one year                         (d) five years
6. The most commonly used mathematical method for measuring the trend is  
(a) Moving average method  
(b) Semi – average method  
(c) Method of least squares  
(d) None of these
7. Another name of consumers price index number is  
(a) Whole sale price index number  
(b) Cost of living index  
(c) Sensitive  
(d) Composite

Page 2

Code No. : 5736



8. Fisher's ideal index number in the geometric mean of the
- Laspeyre's and Marshall - Edgeworth method
  - Laspeyre's and Pasche's method
  - Pasche's and Marshall Edgeworth method
  - None of the above
9. Records of births, deaths, marriages gathered through a registration system maintained by government units are referred to as
- Census
  - Demography
  - Vital statistics
  - None of the above
10. The number of live births per 1000 population in a given year is referred to as the
- Crude birth rate
  - Total fertility rate
  - Morbidity rate
  - Mortality rate

PART B — (5 × 5 = 25 marks)

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

Each answer should not exceed 250 words.

11. (a) The following data relate to age of employees and the number of days they were sick in a month.

|                 |    |    |    |    |    |    |    |    |    |    |
|-----------------|----|----|----|----|----|----|----|----|----|----|
| Age (X) :       | 30 | 32 | 35 | 40 | 48 | 50 | 52 | 55 | 57 | 61 |
| Sick days (Y) : | 1  | 0  | 2  | 5  | 2  | 4  | 6  | 5  | 7  | 8  |

Calculate Karl Pearson's co-efficient of correlation.

Or

- (b) Write a short note on scatter diagram.

12. (a) From the following data obtain the two regression equations.

|     |   |    |    |   |   |
|-----|---|----|----|---|---|
| X : | 6 | 2  | 10 | 4 | 8 |
| Y : | 9 | 11 | 5  | 8 | 7 |

Or

- (b) What are the regression equations?

13. (a) Calculate the trend values by the method of 4 yearly moving averages.

|             |      |      |      |      |      |      |      |      |      |      |
|-------------|------|------|------|------|------|------|------|------|------|------|
| Year:       | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
| Production: | 464  | 515  | 518  | 467  | 502  | 540  | 547  | 571  | 586  | 612  |

Or

- (b) Narrate the uses of time series analysis.



14. (a) Explain time reversal test and factor reversal tests in the tests of adequacy of index numbers.

Or

- (b) Compute Laspeyre's and Pasche index numbers from the following data.

| Item | Base year   |          | Current year |          |
|------|-------------|----------|--------------|----------|
|      | Price (Rs.) | Quantity | Price (Rs.)  | Quantity |
| A    | 5           | 25       | 6            | 30       |
| B    | 3           | 8        | 4            | 10       |
| C    | 2           | 10       | 3            | 8        |
| D    | 10          | 4        | 3            | 5        |

15. (a) What are the various methods of measuring fertility?

Or

- (b) From the data given below calculate the gross reproduction rate and net reproduction rate.

| Age group | No. of children born to 1000 women passing through the age group | Mortality rate |
|-----------|------------------------------------------------------------------|----------------|
| 16-20     | 150                                                              | 120            |
| 21-25     | 1500                                                             | 180            |
| 26-30     | 2000                                                             | 150            |
| 31-35     | 800                                                              | 200            |
| 36-40     | 500                                                              | 220            |
| 41-45     | 200                                                              | 230            |
| 46-50     | 100                                                              | 250            |

Sex ratio being marks : females 52 : 48.

Page 5

Code No. : 5736

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) What are the various types of correlation? Narrate the various methods of studying correlation.

Or

- (b) The ranks of the same 15 students in two subjects A and B are given below. The two numbers within brackets denote the ranks in A and B respectively. (1, 10), (2, 7), (3, 2), (4, 6), (5, 4), (6, 8), (7, 3), (8, 1), (9, 11), (10, 15), (11, 9), (12, 5), (13, 14), (14, 12), (15, 13). Find the Spearman's rank correlation co-efficient.

17. (a) Explain the method of least squares. What are its properties?

Or

- (b) A research company summarised advertising expenditure and sales results as follows.

|           | Adv. Exp.<br>(Rs. in crores) | Sales<br>(Rs. in crores) |
|-----------|------------------------------|--------------------------|
| Mean      | 20                           | 200                      |
| S.D.      | 18                           | 170                      |
| $r = 0.6$ |                              |                          |

Derive the two regression equations.

Page 6

Code No. : 5736



18. (a) Fit a straight line trend by the method of least squares to the following data.

Year : 2001 2002 2003 2004 2005 2006 2007 2008

Earnings  
(Rs. lakhs) 38 40 65 72 69 60 87 95

What would be the predicted earning for the year 2013?

Or

- (b) Explain the various components of time series analysis.
19. (a) Calculate Fishers ideal index from the following data and prove that it satisfies both the time reversal test and factor reversal tests.

| Commodity | Base year      |            | Current year   |            |
|-----------|----------------|------------|----------------|------------|
|           | Price per unit | Exp. (Rs.) | Price per unit | Exp. (Rs.) |
| A         | 8              | 80         | 10             | 120        |
| B         | 10             | 120        | 12             | 96         |
| C         | 5              | 40         | 5              | 50         |
| D         | 4              | 56         | 3              | 60         |
| E         | 20             | 100        | 25             | 150        |

Or

- (b) Explain the various problems involved in the construction of index numbers.

20. (a) Explain the various methods of obtaining vital statistics. What are the uses of vital statistics?

Or

- (b) Compute the crude and standardised death rater of the two populations of town A and town B from the following data.

| Age group (years) | A          |        | B          |        |
|-------------------|------------|--------|------------|--------|
|                   | Population | Deaths | Population | Deaths |
| Below 5           | 15,000     | 360    | 40,000     | 1,000  |
| 5 – 30            | 20,000     | 400    | 52,000     | 1,040  |
| Above 30          | 10,000     | 280    | 8,000      | 240    |
| Total             | 45,000     | 1,040  | 1,00,000   | 2,280  |

