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( CBCS )

( 6th Semester )

**ECONOMICS**

TENTH PAPER

**( Quantitative Techniques—II )**

*Full Marks : 75*

*Time : 3 hours*

*The figures in the margin indicate full marks for the questions*

**( SECTION : A—OBJECTIVE )**

( Marks : 10 )

Tick (✓) the correct answer in the brackets provided :

1×10=10

**1.** Statistics is

- (a) aggregate of facts ( )
- (b) numerically expressed ( )
- (c) systematically collected ( )
- (d) All of the above ( )

**2.** Which of the following is not a method of data collection?

- (a) Questionnaire ( )
- (b) Interview ( )
- (c) Experiment ( )
- (d) Observation ( )

3. Which one of the following is not a mathematical average?
- (a) Geometric mean ( )
  - (b) Harmonic mean ( )
  - (c) Arithmetic mean ( )
  - (d) Median ( )
4. Which one of the following statements is/are true for the standard deviation?
1. It is independent on change of scale.
  2. It is independent on change of origin.
  3. It is the minimum root-mean-square deviation.
- (a) 1 only ( )
  - (b) 1 and 2 only ( )
  - (c) 2 and 3 only ( )
  - (d) All of the above ( )
5. In probability theories, events which can never occur together are called
- (a) dependent events ( )
  - (b) independent events ( )
  - (c) mutually exclusive events ( )
  - (d) non-mutually exclusive events ( )
6. The probability of  $r$  success in  $n$  trials given by  $P(X = r) = {}^n C_r p^r q^{n-r}$  is the general form of
- (a) normal distribution ( )
  - (b) Binomial distribution ( )
  - (c) Poisson distribution ( )
  - (d) None of the above ( )

**7.** If correlation between the two variables is unity, there is

- (a) perfect correlation ( )
- (b) perfect positive correlation ( )
- (c) perfect negative correlation ( )
- (d) no correlation ( )

**8.** In the regression equation  $Y = 21 - 3x$ , the slope is

- (a) 21 ( )
- (b) 3 ( )
- (c) -3 ( )
- (d) 18 ( )

**9.** What type of index number can help the government to formulate its price policies and to take appropriate economic measures to control prices?

- (a) Wholesale price index ( )
- (b) Consumer's price index ( )
- (c) Volume index number ( )
- (d) Composite index ( )

**10.** Weather or climate changes are examples of

- (a) secular trend ( )
- (b) seasonal variation ( )
- (c) cyclical variation ( )
- (d) irregular variation ( )

**( SECTION : B—SHORT ANSWER )**

( Marks : 15 )

Answer the following questions :

3×5=15

UNIT—I

1. What do you understand by descriptive and inferential statistics?

**OR**

2. Distinguish between census and sampling.

UNIT—II

3. What is skewness?

**OR**

4. Mention ideal measures of dispersion.

UNIT—III

5. What are the three axioms of modern probability theory?

**OR**

6. What is normal distribution?

UNIT—IV

7. Explain positive and negative correlation.

**OR**

8. What do you understand by regression analysis?

UNIT—V

9. Write on the various components of time series.

**OR**

10. What are the problems in the construction of index number?

**( SECTION : C—DESCRIPTIVE )**

( Marks : 50 )

UNIT—I

1. (a) Explain diagrammatic and graphic presentation of data. 4  
(b) Draw 'less than ogive' and 'more than ogive' using the data given below : 6

<i>Marks</i>	0-10	10-20	20-30	30-40	40-50	50-60
<i>Frequency</i>	4	6	10	5	3	2

**OR**

2. Draw a sub-divided percentage bar diagram to represent the monthly expenditure of the following three families : 10

<i>Items</i>	<i>Expenditure (in ₹)</i>		
	<i>Family A</i>	<i>Family B</i>	<i>Family C</i>
Food	5,500	9,000	12,000
House rent	1,000	3,000	8,000
Clothes	1,000	2,000	6,000
Education	1,000	1,500	4,000
Entertainment	500	1,000	4,000
Miscellaneous	1,000	3,500	6,000
Total	10,000	20,000	40,000

UNIT—II

3. Calculate mean and standard deviation for the following data : 5+5=10

<i>Marks</i>	0-10	10-20	20-30	30-40	40-50	50-60	60-70
<i>No. of students</i>	5	12	30	45	50	37	21

**OR**

4. The following are some of the particulars of the distribution of weights of boys and girls in a class : 2+3+5=10

	<i>Boys</i>	<i>Girls</i>
Number	100	50
Average height (inches)	60	45
Variance	9	4

- (a) Which of the two distributions is more uniform?  
(b) Calculate combined mean weights.  
(c) Find the standard deviation of the combined data.

UNIT—III

5. (a) State and prove the addition theorem of probability. 6  
(b) A bag contains 8 red, 5 green and 6 white balls. Three balls are drawn at random. What is the probability that a red, a white and a green ball are drawn? 4

**OR**

6. Define normal distribution. Discuss the properties of normal distribution. 3+7=10

UNIT—IV

7. From the following data, estimate Karl Pearson's coefficient of correlation and comment the result : 8+2=10

<i>Price</i> (in ₹)	:	40	50	70	60	50	40	70	80	40	50
<i>Demand</i> (in kg)	:	40	35	30	30	35	40	25	20	35	40

**OR**

8. Calculate the regression equation of  $X$  on  $Y$  and  $Y$  on  $X$  from the following data and estimate  $X$  when  $Y$  is 20 : 4+4+2=10

$X$	10	12	13	17	18
$Y$	5	6	7	9	13

UNIT—V

9. Find the linear trend by the least squares method from the following data and also estimate the likely sales for the year 2022 : 8+2=10

<i>Year</i>	2013	2014	2015	2016	2017	2019	2020
<i>Sales (₹ crores)</i>	20	23	22	25	26	29	30

**OR**

10. Construct index number of prices from the following data by applying Laspeyres method and Paasche's method : 5+5=10

<i>Commodity</i>	<i>2017</i>		<i>2019</i>	
	<i>Price</i>	<i>Quantity</i>	<i>Price</i>	<i>Quantity</i>
<i>A</i>	20	80	40	60
<i>B</i>	50	100	60	50
<i>C</i>	40	140	50	100
<i>D</i>	20	190	20	130

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