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(July)

ECONOMICS

(Honours)

(Statistics)

Marks : 75

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer **five** questions, taking **one** from each Unit

UNIT—I

1. *(a)* The mean salary paid to 1000 employees of a factory was found to be ₹ 180·4. Later on it was discovered that the wages of two employees were wrongly taken as 297 and 165 instead of 197 and 185. Find the correct mean. 5

(b) Calculate the median of the following frequency distribution : 5

Sales	*Frequency*
0–10	4
10–20	16
20–30	15
30–40	20
40–50	7
50–60	5

(c) Define mode. Point out the merits of mode as a measure of central tendency. 2+3=5

2. *(a)* What do you understand by the term 'dispersion'? What purpose does a measure of dispersion serve? 2+5=7

(b) Calculate the standard deviation for the following data : 8

Class interval	*Frequency*
5–10	6
10–15	5
15–20	15
20–25	10
25–30	5
30–35	4
35–40	3
40–45	2

UNIT—II

3. *(a)* Show that the correlation coefficient lies between –1 and +1. 5

(b) Calculate the coefficient of correlation between the marks obtained by 8 students in Mathematics and Statistics :

Student	*Mathematics*	*Statistics*
A	25	8
B	30	10
C	32	15
D	35	17
E	37	20
F	40	22
G	42	24
H	45	25

Interpret the result. 8+2=10

4. *(a)* The final score (Y) of students in a course was correlated with score (X) in entrance test. The relevant data in coded units are as follows :

X	1	6	3	4	2
Y	2	8	5	6	4

Obtain the regression equation of final score on entrance test score. Estimate the value of Y when X 4. 6+2=8

(b) In a partially destroyed laboratory record of an analysis of correlation data, the following results are only legible :

Variance of X 9 ; r 0 60 ;

Regression equation of Y on X :

$$8X \quad 10Y \quad 66 \quad 0$$

Regression equation of X on Y :

$$40X \quad 18Y \quad 214$$

Find out—

(i) the mean values of X and Y;

(ii) standard deviation of Y. 4+3=7

UNIT—III

5. *(a)* What is time series? Point out the significance of time series analysis. 2+4=6

(b) Explain the method of moving average as a measure for determining the trend. What are its merits and demerits? 4+5=9

6. Fit a straight line trend by the method of least squares to the following data and tabulate the trend values :

Year	*Production* (in '000 units)
1992	56
1993	55
1994	51
1995	47
1996	42
1997	38
1998	35
1999	32

Assuming that the same rate of change continues, what would be the predicted production for the year 2003? 8+5+2=15

UNIT—IV

7. *(a)* Define index number. What are its limitations? 2+5=7

(b) What are quantity or volume index numbers? From the following data, compute a quantity index : 4+4=8

Commodity	*Quantity*		*Price*
	2007	*2008*	*2007*
A	30	25	30
B	20	30	40
C	10	15	20

8. Calculate Fisher's ideal index from the following data and prove that it satisfies both the time reversal and factor reversal tests : 7+4+4=15

Commodity	*2017*		*2018*	
	Price	*Expenditure*	*Price*	*Expenditure*
A	40	600	35	700
B	30	300	25	375
C	15	105	20	140
D	10	80	20	120
E	25	50	40	40

UNIT—V

9. *(a)* Distinguish between independent and dependent events. State and prove the multiplication theorem of probability. 3+5=8

(b) A bag contains 9 balls, two of which are red, three blue and four black. Three balls are drawn from the bag at random, that is, every ball has an equal chance of being included in the three. What is the probability that—

(i) the three balls are of different colours;

(ii) two balls are of the same colour and third of different? 3+4=7

10. *(a)* State and explain the properties of a normal curve. 8

(b) What is simple random sampling? Point out its limitations. 4+3=7

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