2023

(May/June)

ECONOMICS

(Honours)

(Statistics)

Marks : 75

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer **one** question from each Unit

UNIT—I

1. *(a)* In a frequency distribution, show that the algebraic sum of the deviations of a set of values from their arithmetic mean is zero. Symbolically, $\Sigma f_i(x_i - \bar{x}) = 0$, $\bar{x}$ being the mean of distribution and f_i is the frequency of x_i. 4

(b) Recast the following cumulative table in the form of an ordinary frequency distribution and determine the value of median, lower and upper quartiles : 8

No. of days absent	*No. of students*
Less than 5	29
Less than 10	224
Less than 15	465
Less than 20	582
Less than 25	634
Less than 30	644
Less than 35	650
Less than 40	653
Less than 45	655

(c) The geometric mean of 2, 4, 8, 16 and x is 4. Find the value of x. 3

2. (a) The distribution of income in the two firms are given below :

	Firm I	*Firm II*
Number of workers	20	25
Average income	550	630
Variance	36	25

(i) Which firm has more uniform income?

(ii) What would be the measures of average and standard deviation of the two firms taken together?

3+3+4=10

(b) Write notes on the following : 2½+2½=5

(i) Skewness

(ii) Kurtosis

UNIT—II

3. (a) Calculate the coefficient of rank correlation (ρ) from the following data set :

X :	74	98	110	70	65	85	88	59
Y :	121	133	170	102	90	152	160	85

Interpret the result. 8

(b) Show that correlation coefficient is independent of the change of origin and scale. 7

4. Obtain the two regression equations by the method of least squares from the following data :

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

Also find the standard error of estimate of Y on X. 6+6+3=15

UNIT—III

5. *(a)* What do you understand by time series? 2

(b) Discuss the importance of time series analysis. 3

(c) Fit a straight trend by the method of least squares to the following data :

Year	*Production* (in tons)
2001	80
2002	90
2003	92
2004	83
2005	94
2006	99
2007	92
2008	104

What would be the expected production in 2012? 8+2=10

6. Discuss the various methods for measuring trends in time series analysis. 15

UNIT—IV

7. *(a)* Explain the following : 2+2+2=6

(i) Price relatives

(ii) Quantity relatives

(iii) Value relatives

(b) What are the limitations of INDEX number? 4

(c) Obtain index numbers for 2015, taking 2012 as the base year, from the following data by using simple aggregate method : 5

Commodity	*Prices* (in ₹)	
	2012 (P_0)	*2015* (P_1)
A	100	140
B	80	120
C	160	180
D	220	240
E	40	40

8. *(a)* From the following data, construct price index numbers for 2016, taking 2006 as the base year by using—

(i) Laspeyre's method

(ii) Paasche's method

(iii) Fisher's method 4+4+4=12

Commodity	*2006*		*2016*	
	Price (P_0)	*Quantity* (Q_0)	*Price* (P_1)	*Quantity* (Q_1)
A	20	8	40	6
B	50	10	60	5
C	40	15	50	15
D	20	20	20	25

(b) Why is Fisher's formula called an ideal index number formula? 3

UNIT—V

9. *(a)* What do you mean by mutually exclusive events? 2

(b) 100 students appeared for two examinations. 60 of them passed the first, 50 passed the second and 30 passed both. Find the probability that a student selected at random failed in both the examinations. 3

(c) Show that Poisson distribution is a limiting form of binomial distribution. 10

10. *(a)* State and explain the properties of a normal distribution. 6

(b) Explain any *three* of the following : 3×3=9

(i) Law of statistical regularity

(ii) Law of inertia of large numbers

(iii) Simple random sampling

(iv) Purposive sampling

(v) Sampling error

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