

Time: 2½ hrs.

Marks:75

Note:

1. All questions are compulsory with internal options.
2. The figures to the right indicate full marks.
3. Draw a neat diagram wherever necessary.

Q. 1 (A) Fill in the blanks with the correct answer from the alternatives given below. (08)  
(Attempt any 8)

- (1) The data collected for the first time is known as \_\_\_\_\_.  
(a) Primary data (b) Secondary data  
(c) Values (d) Information
- (2) Which of the following is not a method of collecting primary data?  
(a) Direct personal interview (b) Indirect oral interview  
(c) Mailed questionnaires (d) Published & unpublished sources
- (3) The ogives can be used to locate graphically the value of \_\_\_\_\_.  
(a) Mean (b) Median  
(c) Mode (d) Correlation
- (4) In a set of 20 observations, the value 87 is repeated maximum number of times, so the following measure can be calculated as 87?  
(a) Mean (b) Median  
(c) Mode (d) Correlation
- (5) The coefficient of correlation always lies between \_\_\_\_\_.  
(a) 0 and 1 (b) -1 and 0  
(c) -1 and 1 (d) 1 and 2
- (6) The correlation is positive if \_\_\_\_\_.  
(a) X increases as y increases (b) X decreases as y decreases  
(c) Both the above conditions are possible (d) X increases as y decreases
- (7) There are \_\_\_\_\_ components of a time series.  
(a) 2 (b) 3  
(c) 4 (d) 5
- (8) Which of the following variations occur due to natural calamities?  
(a) Random variations (b) Seasonal variations  
(c) Cyclical variations (d) Secular trend
- (9) Index number \_\_\_\_\_ carries unit of measurement.  
(a) Sometimes (b) Always  
(c) Rarely (d) Never
- (10) In decision making problem there is only one decision maker, \_\_\_\_\_ alternatives and more than one states of nature.  
(a) More than 1 (b) Only 1  
(c) Less than 1 (d) Infinite

(B) State whether the following statements are True or False. (Attempt any 7) (07)

- (1) The data compiled through various published and unpublished sources is known as secondary data.
- (2) Statistics is a science that deals with collection, classification, analysis and interpretation of numerical facts or data.
- (3) The difference between the limits of a class interval is the magnitude or length of class interval.
- (4) If the data is classified in accordance with quality like intelligence, beauty etc then it is

called quantitative classification.

- (5) If correlation coefficient is zero, then the association between the two variables is perfect positive.
- (6) The regular, seasonal changes in the time series are called seasonal variations.
- (7) The method of moving averages is used to estimate the trend.
- (8) The value index numbers measure the changes in the quantity of goods produced, consumed or sold with reference to the particular period.
- (9) The states of nature represent all the future events that can occur on which the decision maker has no control.
- (10) Under Laplace criterion, the best decision is choosing that course of action with maximum average pay-off.

- Q.2 (a) Find the arithmetic mean for the following data, representing marks of 80 students. (08)

Marks	0-10	10-20	20-30	30-40	40-50
No. of students	12	13	21	19	15

- (b) The following data gives marks of 100 students in a certain test. Find the median. (07)

Marks	10-12	12-14	14-16	16-18	18-20	20-22	22-24
No. of students	11	17	20	22	10	10	10

OR

- Q.2 (p) Find the mode for the following data representing daily wages of 110 employees of a factory. (08)

Daily wages (in Rs)	10-30	30-50	50-70	70-90	90-110	110-130	130-150
No. of employee	11	18	25	30	14	8	4

- (q) The following data gives frequency distribution of marks of some students. The average marks are 33. Using this, find the number of students with marks between 40 and 50. (07)

Marks	0-10	10-20	20-30	30-40	40-50	50-60
No. of students	5	10	25	30	----	10

- Q.3 (a) The following data represents the product time in weeks (X) and the output in thousand units (Y) of a factory. Find the coefficient of correlation and interpret it. (08)

X	7	5	4	11	10	12	14	9
Y	14	8	8	19	16	19	20	16

- (b) Ten industries are ranked according to profit earned (R1) and working capital (R2) in the year 1987-88 as follows. Find rank correlation coefficient. (07)

Industry	A	B	C	D	E	F	G	H	I	J
R1	1	3	5	2	4	10	7	6	8	9
R2	4	1	10	3	2	6	5	9	8	7

OR

- Q.3 (p) Calculate 5 yearly moving average for the following time series giving the number of units produced (in thousands) in a factory during 1997-2006. (08)

Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
No. of units	243	251	254	256	256	245	250	254	258	260

- (q) Fit a straight-line trend to the following time series, representing sales in lakhs of Rs of a (07)

company, for the years 1998 – 2005. Hence or otherwise estimate trend for the year 2006.

Year	1998	1999	2000	2001	2002	2003	2004	2005
Sales (in lakhs of Rs)	31	33	30	34	38	40	45	49

- Q.4 (a) For the following data, calculate laspeyre's, Paasche's and fischer's index numbers. (08)

Commodity	Base Year		Current Year	
	Price	Quantity	Price	Quantity
Rice	4	15	5	20
Pulses	8	20	12	30
Sugar	6	25	8	20
Oil	14	10	21	15

- (b) For the following data calculate cost of living index number for the year 2006 by the Aggregative expenditure method. (07)

Commodity	Unit	Quantity	Price per unit	
		Year 2004	Year 2004	Year 2006
Rice	Kg	15	3	4
Wheat	Kg	18	2	3
Pulses	Kg	12	5	6
Sugar	Kg	8	4	5
Ghee	Kg	5	10	12
Milk	Litre	10	3	4

OR

- Q.4 (p) From the following matrix, the elements of which indicate profits. Obtain the decision using the following principles of decision making (i) laplace criteria (ii) Minimax regret criteria. (08)

Courses of action	States of nature			
	E1	E2	E3	E4
A1	26	26	18	22
A2	22	22	22	22
A3	13	34	18	18
A4	22	30	18	18
A5	18	20	20	18

- (q) Given the following payoff table, find optimal decision using criterion (i) Maximin (ii) Maximax (iii) Laplace (iv) Hurwicz criterion with  $\alpha = 0.7$ . (07)

Courses of action	States of nature		
	S1	S2	S3
A1	25	85	95
A2	40	0	60
A3	65	30	55

- Q.5 (a) If the mode for the following distribution is 130, find the missing frequency. (08)

Class Interval	60-75	75-90	90-105	105-120	120-135	135-150
Frequency	3	3	6	---	7	6

- (b) Calculate the rank correlation coefficient for the following data giving working capital in lakhs of Rs (X) and profit in thousands of Rs (Y) of ten companies for the year 1990-1991. (07)

X	15	32	25	30	35	20	19	22	27	31
Y	50	70	65	72	90	58	53	57	68	74

OR

**Q.5 (p) Write short notes on ( Attempt any 3)**

- (1) Cost of living index numbers
- (2) Limitations of statistics
- (3) Types of classification
- (4) Primary data
- (5) Trend

(15)

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