OLD

2016

Part II 3-Tier

STATISTICS

(General)

PAPER—III

(PRACTICAL)

Full Marks : 100

Time : 4 Hours

The figures in the margin indicate full Marks.

Answer *all* questions.

1. Calculate Skewness and Kurtosis for the following distribution and comment on the nature of the distribution : 8

Mid Value	34·5	44·5	54·5	64·5	74·5	84·5	94·5
Frequency	2	3	11	20	32	25	7

2. Draw a histogram to represent the following frequency distribution of income of 2775 workers and obtain graphically the mode for the data : 8

Income in Rs.	*Frequency of Workers*
70 – 80	380
80 – 90	395
90 – 100	625
100 – 110	600
110 – 120	325
120 – 130	450

3. In a small town the index numbers of five groups of commodities for the year 2006 are given [*Base year 1998*] :

Group	*Index Number*	*Weight*
Food	189·23	34·6
Clothing	134·58	12·8
House-rent and tax	106·00	9·7
Fuel and light	101·77	28·5
Miscellaneous	267·14	14·4

Using the weights compute an index number of cost of living for the town in 2006. It is known that the income of a person of the town was Rs. 30,650/- in 2006.

What was his equivalent income in 1998 ? 8

4. You are given the population figures of India as follows :

Census year (x) :	1911	1921	1931	1941	1951	1961
Population (*in crores*) :	25·0	25·1	27·9	31·9	36·1	43·9

Fit an exponential trend and estimate the population in 1981 and 1991. 8

8. The results of an examination are summarised below :

Marks interval	*Percentage of students*
More than 85	15
Between 40 and 85	42
Less than 40	43
Total	100

Assuming a normal distribution of the marks obtained by a student, determine the interval (mean ± 30). Also find the probability that the marks of a randomly selected student lies between 75 and 95. 10

9. Following are reaction time of two groups of differently trained men :

Group X	56	62	69	63	54	67	60	51	58		
Group Y	62	70	71	62	60	56	75	64	72	68	66

Test whether reaction times of Gr. X are significantly shorter than Gr. Y ? 10

10. Practical Note Book 10

11. Viva-Voce. 10

5. Marks on Statistics (x) and Mathematics (y) in an examination of 10 students are given below :

x	45	52	63	78	49	63	59	67	80	70
y	50	52	68	72	50	62	60	64	75	67

Find a linear predicting formula for y in terms of x.

Let $\hat{y}_i$ be the predicted value of y_i. Then find $\frac{\text{var}(\hat{y})}{\text{var}(y)}$ and comment on the correlation between x and y. 8

6. The following are the numbers of defective machine parts found during successive samples of 500 machine parts :

106, 116, 164, 89, 99, 40, 112, 36, 69, 74, 42, 37, 25, 88, 101.

Draw control chart for fraction defective and comment on the state of the control of the process. 10

7. A part of life table is given here with most of the entries missing on the basis of the available figures. Supply the missing ones and complete the table : 10

Age (x)	l(x)	d(x)	1000q(x)	L(x)	T(x)	e°(x)
10	90,102		0·62			
11			0·66			
12			0·72			
13			0·80			
14			0·90			
15			1·00			
16			1·12			
17			1·23			
18			1·33			
19			1·40		48,42,466	