

Total No. of printed pages = 6

3 (Sem-5) STS M2 Pr

2019

STATISTICS

(Major Practical)

Paper : 5.6

Full Marks – 75

Pass Marks – 30

Time – Four hours

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

GROUP – A

Answer any *five* questions.

1. Calculate seasonal variation indices by the ratio to trend method from the data given below : 10

Years \ Quarters	I	II	III	IV
2001	15	20	18	17
2002	17	26	25	22
2003	20	26	27	24
2004	27	38	34	31

[Turn over

2. The data given below relate to the distribution of income of urban households in India during a certain year.: 10

Income class (Rs.)	Percentage of households
Under 500	13.6
500 – 999	28.9
1,000 – 1,999	32.5
2,000 – 2,999	10.6
3,000 – 3,999	5.6
4,000 – 4,999	3.1
5,000 – 5,999	1.7
6,000 – 7,999	1.7
8,000 – 9,999	0.7
10,000 – 14,999	0.8
15,000 – 24,999	0.5
25,000 or over	0.3

Fit a Pareto distribution to the data. With the estimated values of parameters, derive the Lorentz concentration coefficient and mean income of the distribution.

3. From the following sample data on X on Y, where X is an independent and Y is a dependent variable, set up the analysis of variance table for regression analysis and write your conclusion.

10

X :	15	16	17	14	14	16	11	17	19	18
Y :	16	17	15	14	19	20	17	19	21	22

4. (a) An enquiry into the budgets of the middle class families in a certain city in India gave the following information :

5

Expenses on	Year 2000 price (Rs.)	Year 2002 Price (Rs.)
Food 35%	150	145
Fuel 10%	25	23
Clothing 20%	75	65
Rent 15%	30	30
Misc. 20%	40	45

What is the cost of living index number of 2002 as compared with that of 2000 ?

- (b) Assuming 4 yearly cycle, calculate the trend values by the method of moving average and plot the actual data and trend values on graph.

5

Year	Sales ('000 Rs)
1987	285
1988	320
1989	310
1990	362
1991	355
1992	336
1993	350
1994	342
1995	359

5. A project has the following schedule : 10

Activity	Time in weeks
(1-2)	4
(1-3)	1
(2-4)	1
(3-4)	1
(3-5)	6
(4-9)	5
(5-6)	4
(5-7)	8

Activity	Time in weeks
(6-8)	1
(7-8)	2
(8-9)	1
(8-10)	8
(9-10)	7

Construct PERT network and compute :

- (i) T_E and T_L for each event
- (ii) Float for each activity
- (iii) Critical path and its duration.

6. A computer contains 10,000 resistors. When any resistor fails, it is replaced. The cost of replacing a resistor individually is Rs.2. If all the resistors are replaced at the same time, the cost per resistor would be reduced to 50 paise. The per cent surviving say $s(t)$ at the end of month t and $P(t)$ the probability of failure during the month t are :

t :	0	1	2	3	4	5	6
$S(t)$:	100	97	90	70	30	15	0
$P(t)$:	—	0.03	0.07	0.20	0.40	0.15	0.15

What is the optimum replacement plan ? 10

GROUP – B

7. Practical Notebook.	5
8. Viva voce.	5
9. Internal Assessment.	15