Total No. of printed pages = 4

3(Sem-6) STS Pr (S-I)

2019

STATISTICS

(General Practical)

Set – I

Full Marks – 100

Pass Marks – 40

Time – Four hours

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

Answer any *three* questions from the following :

1. Construct a Control chart for mean and range for the following data on 12 samples each of size 5. Comment on whether the production process seems to be under control. 20

Sample No. :

1	42	65	75	78	87
2	42	45	68	72	90

[Turn over

Sample No. :					
3	19	24	80	81	81
4	36	54	69	77	84
5	42	51	57	59	78
6	51	74	75	78	132
7	60	60	72	95	138
8	18	20	27	42	60
9	15	30	39	62	84
10	69	109	113	118	153
11	64	90	93	109	112
12	61	78	94	109	136

2. (a) The following table gives the average grade (G) of 10 students and income (Y) of their parents :

Grade (G) :	90	80	60	70	40	60	70	50	45	40
Income(Y) (in '000 Rs.)	25	21	15	15	9	12	18	6	12	8

(i) Estimate the regression line $G = a + by$.

(ii) Interpret (a) and (b).

(iii) Test the hypothesis that grades of students depend on the income of their parents.

7+2+3=12

(b) Defects found during the inspection of the first 10 samples of size 100 each are given below :

Sample No :	1	2	3	4	5	6	7	8	9	10
No. of defectives :	4	8	11	3	11	7	7	16	12	6

(i) Obtain the UCL and LCL for the percentage defectives in the sample. 6

(ii) Plot the observed data and comment on the same. 2

3. The following data give the number of defectives in 10 independent samples of varying sizes from a production process : 20

Sample No.	Sample size	No. of defectives
1	2,000	425
2	1,500	430
3	1,400	216
4	1,350	341
5	1,250	225
6	1,760	322
7	1,875	280
8	1,955	306
9	3,125	337
10	1,575	305

Draw the control chart for fraction defective and comment on it.

4. (a) Consider the following data :

Investment (Y) :	65	57	63	60	66
Output (X) :	27	15	20	20	28

Estimate the regression of investment on output. Test hypothesis that $\beta = 0$ at 5% level of significance. 10

(b) From the following data : 10

$\Sigma X = 51.13$ $\Sigma Y = 117.25$

$\Sigma X^2 = 1.27$ $\Sigma Y^2 = 4.78$

$\Sigma XY = 1.84$ and $N = 16$.

(i) Estimate the mean value of Y when $X = 10$

(ii) Estimate the mean value of X when $Y = 20$.

5. Practical Notebook. 10

6. Viva voce. 10

7. Internal assessment. 20