

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION DECEMBER 2018
(Third Semester)

Branch -Software Systems
(Five year integrated)

STATISTICAL METHODS

Time: Three Hours

Maximum: 75 Marks

Answer ALL questions
ALL questions carry EQUAL marks (5x15 = 75)

1 a Find the mean, median and mode from the following data :

| | | | | | | | |
|------------------------|-----|-----|------|-------|-------|-------|-------|
| Salary (in thousand) : | 3-5 | 5-8 | 8-10 | 10-15 | 15-20 | 20-30 | 30-50 |
| No. of persons : | 10 | 25 | 52 | 173 | 108 | 36 | 16 |

OR

b i) Find the range and its coefficient of range for the following values :
25 24 23 32 40 27 30 25 20 10 15 45

ii) Find the standard deviation for the following

| | | | | | |
|-------|------|-------|-------|-------|-------|
| C.I : | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 |
| f : | 2 | | 9 | 3 | 1 |

2 a i) Calculate the coefficient of rank correlation from the following data

| | | | | | | | | | | |
|-----|----|----|----|----|----|----|----|----|----|----|
| X : | 68 | 64 | 75 | 50 | 64 | 80 | 75 | 40 | 55 | 64 |
| Y : | 62 | 58 | 68 | 45 | 81 | 60 | 68 | 48 | 50 | 70 |

Find the correlation coefficient from the following data :

| | | | | | | | | |
|-----|----|----|----|----|----|----|----|----|
| X : | 65 | 66 | 67 | 67 | 68 | 69 | 70 | 72 |
| Y : | 67 | 68 | 65 | 68 | 72 | 72 | 69 | 71 |

b i) A coin is tossed six times. What is the probability of obtaining four or more heads?

ii) The following mistakes per page were observed in a book :

| | | | | | |
|-------------------------------------|-----|----|----|---|-----|
| No. of mistakes per page : | no | 1 | 2 | 3 | 4 |
| No. of times the mistake occurred : | 211 | 90 | 19 | 5 | fir |

Fit a Poisson distribution for the given data.

3 a Two salesman A and B are working in a certain district. From a sample survey difference in the average sales between the two salesmen conducted by the head office, the following results were obtained. State whether there is any significant difference in the average sales between the two salesmen :

| | | |
|--------------------------------------|-----|-----|
| | A | B |
| No. of sales | 200 | 180 |
| Average sales (in Rs.) | 170 | 205 |
| Standard deviation of sales (in Rs.) | 20 | 25 |

OR

b The standard deviation of the height of student of a college is 4.0 cm. Two samples are taken, The standard deviation of 100 BCom students is 5 cm and 50 RA Fennmics students is 4.5 cm Test the

- 4 a In a test given to two groups of students drawn from two normal populations, the marks obtained were as follows :

| | | | | | | | | | |
|-----------|----|----|----|----|----|----|----|----|----|
| Group A : | 18 | 20 | 36 | 50 | 49 | 36 | 34 | 49 | 41 |
| Group B : | 29 | 28 | 26 | 35 | 30 | 44 | 46 | | |

Examine at 5% level, whether the two population have the same variance.

OR

- b Three different machines are used for production. On the basis of the outputs. Setup One-Way ANOVA table and test whether the machines are equally effective.

Given that the value of F at 5% level of significance for (2, 9) d.f is 4.26.

| Machines | | |
|-----------|------------|-------------|
| Machine I | Machine II | Machine III |
| 10 | 9 | 20 |
| 15 | 7 | 16 |
| 11 | 5 | 10 |
| 10 | 6 | 14 |

- 5 a i) From the table given below, whether the colour of son's eyes is

| | | Eye colour of sons | |
|-----------------------|-----------|--------------------|-------|
| | | Not light | Light |
| Eye colour of fathers | Not light | 230 | 148 |
| | Light | 151 | 471 |

- ii) A die was thrown 498 times Denoting x to be the number of appearing on the top face, the observed frequencies of x are given below :

| | | | | | | |
|-----|----|----|----|----|----|----|
| x : | 1 | 2 | 3 | 4 | 5 | 6 |
| f : | 69 | 78 | 85 | 82 | 86 | 98 |

What opinion you would form for the accuracy for the die?

OR

- b The following are the weight gains (in pounds) of two random samples of young Indians fed on two different diets but otherwise kept under identical conditions :

| | | | | | | | | | | | | |
|-----------|------|------|------|------|------|------|------|------|------|------|------|------|
| Diet I : | 16.3 | 10.1 | 10.7 | 13.5 | 14.9 | 11.8 | 14.3 | 10.2 | 12.0 | 14.7 | 23.6 | 15.1 |
| | 14.5 | 18.4 | 13.2 | 14.0 | | | | | | | | |
| Diet II : | 21.3 | 23.8 | 15.4 | 19.6 | 12.0 | 13.9 | 18.8 | 19.2 | 15.3 | 20.1 | 14.8 | 18.9 |
| | 20.7 | 21.1 | 15.8 | 16.2 | | | | | | | | |

Use U test at 0.01 level of significance to test to the null hypothesis that the two population samples are identical against the alternative hypothesis that on the average the second diet produces a greater gain in weight.