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| ADMISSION NUMBER | | | | | | | | | |
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School of Basic Sciences
Master of Science in Mathematics
Semester End Examination - Nov 2023

Duration : 180 Minutes
Max Marks : 100

Sem III - MBS28T2111 - Research Methodology

General Instructions

Answer to the specific question asked

Draw neat, labelled diagrams wherever necessary

Approved data hand books are allowed subject to verification by the Invigilator

- 1) What is type II error. K1 (2)
- 2) Name which distribution, sampling distribution of two sample means obtained from two normal populations respectively will follows. Also write the formula for the distribution. K2 (4)
- 3) Illustrate briefly the stages of report writing. K2 (6)
- 4) Apply t-test of population mean for the following problem Ten individuals are chosen at random from the population and their heights are found to be inches 63, 63, 64, 65, 66, 69, 69, 70, 70, 71. Discuss the suggestion that the mean height in the universe is 65 inches given that for 9 degree of freedom the value of student's 't' at 0.05 level of significance is 2.262. K3 (9)
- 5) Solve for X when Y=10, if the two lines of regressions are $X = 1/18Y + \lambda$; $Y = -2X + \mu$ where (λ, μ) are unknown and the mean of the distribution is at (-1,2). Find r, μ, λ . K3 (9)
- 6) Prove that the mean deviation about the mean \bar{x} of the variable x, the frequency of whose ith size x_i is f_i is given by: K5 (10)

$$\frac{2}{N} \left(\bar{x} \sum_{x_i < \bar{x}} f_i - \sum_{x_i < \bar{x}} f_i x_i \right)$$
- 7) A sample analysis of examination results of 200 MBA's was made. It was found that 46 students had failed, 68 secured a third division, 68 secured a 2nd division and the rest were placed in first division. Analyse these figures commensurate with the general examination result which is in the ratio of 4:3:2:1 for various categories respectively. K4 (12)
- 8) Explain the following parts of a report: title page, table of contents, executive summary, problem definition, research design, data analysis, conclusions and recommendations. K5 (15)

- 9) Evaluate:(i) Quartile deviation, and (ii) Mean Deviation from mean, for the following data: K5 (15)

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|------------------|------|-------|-------|-------|-------|-------|-------|
| Marks: | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 |
| No. of students: | 6 | 5 | 8 | 15 | 7 | 6 | 3 |

- 10) Height of fathers and sons in inches are given below: K6 (18)

| | | | | | | | | |
|------------------|----|----|----|----|----|----|----|----|
| Height of Father | 65 | 66 | 67 | 67 | 68 | 69 | 70 | 71 |
| Height of Son | 66 | 68 | 65 | 69 | 74 | 73 | 72 | 70 |

Discuss the two lines of regression and calculate the estimated average height of son when the height of father is 68.5 inches.