

## Statistics for Decision Making - II

Full Marks: 30 Time : 2 hr

Answer 1 and any two from the rest.

1. Some academicians opine that mathematical aptitude varies widely among the students. To examine the statement (with a threshold equal to 25), 10 students are tested and their test scores are as follows:

62, 35, 50, 15, 48, 72, 19, 42, 40, 82

Perform a suitable test and make necessary conclusion. (10)

2. If  $X \sim N(\mu, \sigma^2)$  such that  $\mu$  is known, then find the MLE and MVUE of  $\sigma^2$ . Give comment(s) on your findings. (10)

3. a) Show that MVUE, if it exists, is unique. (5)

b) For a random sample of size  $n$  from a distribution with pdf

$$f(x) = \begin{cases} \frac{1}{\theta_2} e^{-\frac{x-\theta_1}{\theta_2}}, & x > \theta_1, \theta_1 > 0, \theta_2 > 0 \\ 0, & \text{Otherwise} \end{cases}$$

Find the sufficient statistic(s) for  $\theta_1$  and  $\theta_2$  (5)

4. a) State and proof Rao-Blackwellization theorem. (6)

b) Define i) Level of Significance, ii) p-value. (4)