Roll No.: ....

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W-3316

M.A./M.Sc. (Fourth Semester) Examination, June-2020

MATHEMATICS

Paper - 410

Advanced Mathematical Statistics

Time : Three Hours

Maximum Marks : 85 (For Regular)
Minimum Pass Marks : 29
Maximum Marks : 100 (For Private)
Minimum Pass Marks : 34

Note : Attempt **all** questions.

Unit - I

Q.1. Fit a second degree parabola to the data given below:

x	0.5	1.0	1.5	2.0	2.5	3.0	3.5
y	2	6	12	20	30	42	56

Unit - II

Q.2. State and prove Baye's theorem. For the rectangular distribution $y = \frac{1}{2a}$, where $-a \le x \le a$, show that the moment generating function about origin zero is given by $\frac{1}{at \sinh at}$. Also show that $\mu_{2n} = \frac{a^{2n}}{(2n+1)}$.

Unit - III

Q.3. If T_1 and T_2 be the two unbiased estimation of $\gamma(\theta)$ with variances σ_1^2, σ_2^2 and correlation ρ. What is the best unbiased linear combination of T_1 and T_2 and what is the variance of such a combination?

Unit - IV

Q.4. Define t-distribution and show that as $\nu \to \infty$,

$$\frac{1}{\sqrt{\pi}} \frac{1}{\sqrt{\nu}} \frac{\left\lceil \frac{\nu+1}{2} \right.}{\left\lceil \frac{\nu}{2} \right.} \frac{1}{\left(1+\frac{t^2}{\nu}\right)^{\frac{\nu+1}{2}}} \to \frac{1}{\sqrt{2\pi}} e^{-t^2/2}$$

Unit - V

Q.5. Explain Randomised block design and carry out its statistical analysis for one observations per experimental unit.