

U.G. 2nd Semester Examination - 2020

STATISTICS

[HONOURS]

Course Code : STAT(H)/CC-P-4

(Probability and Probability Distributions-II-Lab)

[PRACTICAL]

Full Marks : 20

Time : 2 Hours

The figures in the right-hand margin indicate marks.

Candidates are required to give their answers in their own words as far as practicable.

Notations and symbols have their usual meaning.

1. Suppose X follows $N(0, 1)$ and Q_1 and Q_3 are, respectively, the 1st and 3rd quartiles of X . Another random variable Y is defined as

$$\begin{aligned} Y &= 1 \text{ if } X < Q_1 \\ &= 2 \text{ if } Q_1 \leq X < Q_3 \\ &= 3 \text{ if } X \geq Q_3. \end{aligned}$$

Compute $E(Y)$ and $\text{Var}(Y)$.

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2. The length of a rod is normally distributed with mean 4 inches and standard deviation 0.1 inch. Two such rods are placed end to end fitted into a slot, the length of which is 8 inches with a tolerance of 0.1 inch above or below 8 inches. Find the probability that the two rods will fit into the slot. 3
3. The life time of light bulb follows exponential distribution with mean 600 hours. What is the probability that it will last between 500 and 700 hours? 3
4. Practical note book. 5
5. Viva voce. 5

[Turn over]