BACHELOR OF TECHNOLOGY (CBCS - 2023)

B. Tech. Sem-I Computer Science & Business Systems : WINTER : 2024

SUBJECT: INTRODUCTORY TOPICS IN STATISTICS, PROBABILITY & CALCULUS

Day : Wednesday | Time : 10:00 AM-01:00 PM

Date : 04/12/2024 | **W-27622-2024** | Max. Marks : 60

N.B.

1) All questions are **COMPULSORY.**
2) Figures to the right indicate **FULL** marks.
3) Use of non – programmable **CALCULATOR** is allowed.
4) Draw neat and labelled diagram **WHEREVER** necessary.

Q.1 Define statistics and explain its scope. **(10)**

OR

Q.1 What are the precautions for collecting secondary data? **(10)**

Q.2 Obtain regression lines for the following data **(10)**

X	2	3	5	7	9	10	12	15
Y	2	5	8	10	12	14	15	16

OR

Q.2 Ranks obtained by 10 students in statistics and mathematics are given below: **(10)**

$(9,7),(1,10),(10,2),(4,8),(5,4),(3,6),(8,9),(7,1),(2,3),(6,5)$

The first figure in bracket denotes rank in statistics and the second figure indicates rank in mathematics. Compute rank correlation coefficient.

Q.3 A variable X has the following probability distribution **(10)**

X	-3	6	9
P(X= x)	1/6	1/2	1/3

Find E(X), $E(X^2)$ and $E(2X+1)^2$

OR

Q.3 The contents of 3 urns are as follows: **(10)**

Urn I : 4 white, 2 blue and 3 yellow balls

Urn II : 2 white, 3 blue and 1 yellow balls

Urn III: 5 white, 5 blue and 3 yellow balls

One urn is chosen at random and two balls are drawn. They happen to be white and blue. What is the probability that they come from the urn III?

Q.4 The probability that an evening college student will graduate is 0.3. Determine the probability that out of 5 students **(10)**

i) none ii) one iii) at least one will graduate

OR

Q.4 Assuming that on an average, 5% of the output of a factory making certain parts is defective and that 200 units are in a package, what is the probability that at most 4 defective parts may be found in a package? **(10)**

Q.5 Solve: $\dfrac{dy}{dx}=\dfrac{x-2y+5}{2x+y-1}$ **(10)**

OR

Q.5 Evaluate: $\left(x^2+y^2+x\right)dx+xy\,dy=0$ **(10)**

Q.6 Evaluate: $\displaystyle\int_0^1\int_{4y}^4 e^{x^2}\,dx\,dy$ **(10)**

OR

Q.6 Evaluate: $\displaystyle\int_0^1\int_0^{\sqrt{1-y^2}} \frac{dx\,dy}{\left(1+e^y\right)\sqrt{1-x^2-y^2}}$ **(10)**

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