BACHELOR OF TECHNOLOGY (C.B.C.S.) (2020 COURSE)
B.Tech.Sem - IV COMPUTER : : SUMMER - 2022
SUBJECT : PROBABILITY & STATISTICS

Day : Tuesday

Date : 14-06-2022

S-24233-2022

Time : 10:00 AM-01:00 PM

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.

Q.1   If A can hit target 3 times in 5 shots, If B can hit target 2 times in 5 shots, If **(10)** C can hit target 3 times in 4 shots. They fire volley. What is the probability that

a) Two shots hit

b) At least two shots hit.

OR

A committee consists of 9 students two of which are from 1st year, three from 2nd year and four from 3rd year. Three students are to be removed at random. what is the chance that

a) The three students belongs to different classes.

b) Two belongs to same class and third from different class.

c) The three belongs to same class.

Q.2   X is a continuous random variable with probability density function given by: **(10)**

$$f(x) = kx(0 \le x \le 2)$$
$$= 2k(2 \le x \le 4)$$
$$= -kx + 6k(4 \le x \le 6)$$

Find k and mean value of x.

OR

A variate X has probability distribution

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

Find E(X) and E(X^2). Hence evaluate E(2X+1)^2.

Q.3   In a certain factory turning out razor blades, there is a small chance of $\dfrac{1}{500}$ **(10)** for any blade to be defective. The blades are supplied in a packets of 10. Use poisson distribution to calculate the approximate number of packets containing no defective and two defective blades in a consignment of 10,000 packets.

OR

The mean weight of 500 students is 63 kgs, and standard deviation is 8 kgs. Assuming that the weights are normally distributed, find how many students weight 52 kgs? The weights are recorded to nearest kgs.

$A_1[(z_1 = 1.44) = 0.4251]$ $A_2[(z_2 = 1.31) = 0.4049]$

P.T.O.

Q.4 Given $r = 0.9$, $\sum xy = 70$, $\sigma_y = 3.5$ $\sum x^2 = 100$. Find the number of items, **(10)** if X and Y are deviation from Arithmetic mean.

OR

Calculate the coefficient of correlation for

x	5	9	15	19	24	28	32
y	7	9	14	21	23	29	30
f	6	9	13	20	16	11	7

Q.5 Obtain regression lines for the following: **(10)**

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

Find estimate of **i)** Y when X = 6 **ii)** X when Y = 20.

OR

The two regression equation of the variable x and y are
$x = 19.13 - 0.87y$, $y = 11.64 - 0.5x$

Find : **i)** $\left(\overline{x}, \overline{y}\right)$ **ii)** Correlation coefficient between x and y.

Q.6 The simple correlation coefficient between temperature (X_1), corn yield (X_2) **(10)** and rainfall (X_3) are $r_{12} = 0.59$, $r_{13} = 0.46$, $r_{23} = 0.77$.
Calculate partial correlation coefficient $r_{12.3}$ and multiple correlation coefficient $R_{1.23}$.

OR

Calculate : $R_{1.23}$ **b)** $R_{3.12}$ **c)** $R_{2.13}$ for
$\overline{X_1} = 6.8$ $\overline{X_2} = 7.0$ $\overline{X_3} = 74$
$S_1 = 1.0$ $S_2 = 0.8$ $S_3 = 9$
$r_{12} = 0.6$ $r_{13} = 0.7$ $r_{23} = 0.65$

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