8. Find the Spearmen's rank correlation coefficient to the following two series X and Y : **15**

X	60	45	60	70	50	75	80	75	60
Y	50	60	80	70	70	50	60	65	55

(Compulsory Question)

9. (a) From the pack of well shuffled cards, one card is drawn. Find the probability that this card is either a king or an ace. **4**

(b) Two players A and B play tennis games. Their chances of winning a game are in the ratio 3:2 respectively. Find A's chance of winning at least two games out of four games played. **4**

(c) Define the following with one suitable example : **4**

(i) Sampling

(ii) Confidence interval.

(d) Write short note on Chi-square test. **3**

Sep-21-00015

B. Tech. EXAMINATION, 2021

Semester III (CBCS)

PROBABILITY & STATISTICS (CE, ME, TE, AE, ECE, EE, EEE, CES, IT)

MA-301

Time : 2 *Hours* *Maximum Marks :* 60

The candidates shall limit their answers precisely within 20 pages only (A4 size sheets/assignment sheets), no extra sheet allowed. The candidates should write only on one side of the page and the back side of the page should remain blank. Only blue ball pen is admissible.

Note : Attempt *Four* questions in all, selecting *one* question from any of the Sections A, B, C and D. Q. No. **9** is compulsory.

Section A

1. A bag contains 6 red and 2 black balls and a second bag contains 4 red and 6 black balls. One ball is

drawn at random from the first bag and transferred to the second bag. Now, a ball is drawn from the second bag. Find the probability that it is a red ball. **15**

2. A random variable X has the following probability distribution : **15**

X	0	1	2	3	4
P(X)	c	$2c$	$2c$	c^2	$5c^2$

Find :

(i) The value of c.

(ii) Evaluate P(X < 3), P(0 < X < 4).

Section B

3. A continuous random variable X has the probability density function (pdf) :

$$f(x) = \begin{cases} ax^3, & 0 \le x \le 1 \\ 0, & \text{elsewhere} \end{cases}$$

Determine a and find $P\left(X < \frac{1}{4}\right)$ and P(X > 1/2). **15**

4. In the book of 600 pages, there are 60 typographical errors. Assuming Poisson law for the number of error per page, find the probability that a randomly chosen 4 pages will contain no error. **15**

Section C

5. A sample of 400 electric fuses is taken from a big lot of electric fuses. The mean life of the fuses in this sample is found to be 265 days. Can we assume that this sample has come from a population of fuses with mean life 280 days and variance 900 days ? Assume 5% level of significance. **15**

6. Calculate standard error of the difference between the mean of two samples. **15**

Section D

7. The values of two random samples are given below : **15**

Sample 1	15	25	16	20	22	24	21	17	19	23

Sample 2	35	31	25	38	26	29	32	34	33	27	29	31

Can we conclude that the two samples are drawn from the same population ? Test at 5% level of significance.