

Code: 9FBS101

MCA I Semester Supplementary Examinations May/June 2019

PROBABILITY & STATISTICS

(For 2009, 2010, 2011, 2012 (LC), 2013, 2014, 2015 & 2016 admitted batches only)

Time: 3 hours

Max. Marks: 60

Answer any FIVE questions
 All questions carry equal marks

- 1 (a) Box A contains 5 red and 3 white marbles and box B contains 2 red and 6 white marbles. If a marble is drawn from each box, what is the probability that they are both of same colour.
- (b) In a factory, machine A produces 40% of the output and machine B produces 60%. On the average, 9 items in 1000 produced by A are defective and 1 item in 250 produced by B is defective. An item drawn at random from a day's output is defective. What is the probability that it was produced by A or B?
- 2 (a) Let X denote the number of heads in a single toss of four fair coins. Determine: (i) $P(X < 2)$. (ii) $P(1 < X < 3)$.
- (b) Suppose a continuous random variable X has the probability density $f(x) = k(1 - x^2)$ for $0 < x < 1$, and $f(x) = 0$ otherwise. Find: (i) k. (ii) Mean.
- 3 (a) The mean and variance of a binomial distribution are 4 and $4/3$ respectively. Find $P(X \geq 1)$.
- (b) In a sample of 1000 cases, the mean of certain test is 14 and standard deviation is 2.5. Assuming the distribution to be normal, find: (i) How many students score between 12 and 15? (ii) How many score above 18?
- 4 Let $S = \{1, 5, 6, 8\}$, find the probability distribution of sample mean for a random sample of size 2 drawn without replacement.
- 5 (a) A random sample of size 100 has a standard deviation of 5. What can you say about the maximum error with 95% confidence?
- (b) A sample of 11 rats from a central population had an average blood viscosity of 9.32 with a standard deviation of 0.61. Estimate the 95% confidence limits for the mean blood viscosity of the population.
- 6 (a) A sample of 64 students have a mean weight of 70 kgs. Can this be regarded as a sample from a population with mean weight 56 kgs and standard deviation 25 kgs?
- (b) In a big city 325 men out of 600 men were found to be smokers. Does this information support the conclusion that the majority of men in this city are smokers?
- 7 (a) A sample of 26 bulbs gives a mean life 990 hours with S.D of 20 hours. The manufacturer claims that the mean life of bulbs in 1000 hours. Is sample not up to the standard?
- (b) The number of automobile accidents per week in a certain community are as follows: 12, 8, 20, 2, 14, 10, 15, 6, 9, 4. Are these frequencies in agreement with the belief that accident conditions were the same during this 10 week period?

- 8 (a) Fit a straight line to the data given below:

X	0	5	10	15	20	25
Y	12	15	17	22	24	30

- (b) Calculate the regression equation of Y on X from the following data given below, taking deviations from actual means of X and Y.

Price(Rs)	10	12	13	12	16	15
Amount demanded	40	38	43	45	37	43