Code: 9FBS101

MCA I Semester Supplementary Examinations June/July 2018

PROBABILITY & STATISTICS

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

Time: 3 hours Max. Marks: 60

Answer any FIVE questions
All questions carry equal marks

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1 (a) Define conditional event, independent event and dependent event.
(b) Three machines I, II, III produce 40%, 30%, of the total number of items of factory. The percentage of defective items of these machines are 4%, 2%, 3%. If an item is selected at random, find the probability that the item is defective.

2 A random variable X has the following probability distribution.

Values of x	0	1	2	3	4	5	6	7	8
P(x)	a	3a	5a	7a	9a	11a	13a	15a	17a

(i) Determine the value of a. (ii) Find P(x<3), P(x≥3). (iii) P(0<x<5).

3 (a) Derive mean for normal distribution.
(b) If a Poisson variate 2P(X=0) = P(X=2), find the probability that: (i) P(x ≤ 3). (ii) P(2 < x ≤ 5).

4 A population consists of four numbers: 3, 4, 5 and 6. Consider all possible district samples of size 2 with replacement. Find: (i) Population mean. (ii) Population standard deviation (SD). (iii) Sampling distribution of means (SDM).

5 (a) The mean and standard deviation of a population are 225 and 278 respectively. What can be assert with 95% confidence about the maximum error if $\bar{x} = 225 \; and \; n = 100$?
(b) Construct 95% confidence interval for the mean in question (a).

6 The mean life of a sample of 10 electric bulbs (or motors) was found to be 1456 hours with standard deviation of 423 hours. A second sample of 17 bulbs (motors) chosen from a different batch showed a mean life of 1280 hours with standard deviation of 398. Is there a significant difference between the means of two batches? Also construct 95% confidence limits.

7 (a) Give test statistic for: (i) t - test. (ii) f - test. (iii) χ^2 - test.
(b) From the following data, find whether there is any significant liking in the habit of taking soft drinks among the categories of employees.

	Employees		
Soft drinks	Clerks	Teachers	Officers
Pepsi	10	25	65
Thumsup	15	30	65
Fanta	50	60	30

8 Find the least square regression equation of x_1 on x_2 and x_3 from the following data.

x_1	3	5	6	8	12	14
x_2	16	10	7	4	3	2
x_3	90	72	54	42	30	12

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