S.D.E.

M.C.A. Sem -II : WINTER - 2018
SUBJECT : PROBABILITY & COMBINATORIES

Day : Monday
Date : 03/12/2018 **W-2018-4800**
Time : 02.00 PM TO 05.00 PM
Max. Marks : 80

N.B.

1) Attempt **ANY FIVE** questions from Section – I and **ANY TWO** questions from Section – II.
2) Figures to the **RIGHT** indicate **FULL** marks.
3) Both the sections should be written in **SEPARATE** answer books.
4) Use of non-programmable calculator is **ALLOWED**.

SECTION – I

Q.1 A committee of 5 people is to be chosen from a group of 6 men and 4 women. How many committees are possible if **(10)**

i) there are to be 3 men and 2 women ?
ii) there are to be men only ?

Q.2 In a hand of Poker, 5 cards are dealt from a regular pack of 52 cards. In how many of these hands are there **(10)**

i) all hearts ?
ii) all the same colour ?

Q.3 Let A & B are independent events of a sample space, if $P(A \cup B) = 0.7$, $P(A \cap B) = 0.2$. Find P(A) and P(B). **(10)**

Q.4 Define exponential distribution with parameter θ. Derive its mean and variance. **(10)**

Q.5 Solve the recurrence relation $a_n = 7a_{n-1} - 10a_{n-2}$ with $a_0 = 2$ and $a_1 = 3$. **(10)**

Q.6 Define sample space of a random experiment. Explain with illustrations different classifications of sample spaces. **(10)**

Q.7 Write short notes on **ANY TWO** of the following. **(10)**

a) Pigeonhole principle
b) Conditional probability
c) Negative Binomial distribution
d) Inclusion and exclusion principle.

SECTION – II

Q.8 A sample of 500 dry battery cells tested to find the length of life produced the results, mean 12 hours and standard deviation 3 hours. Assuming the data to be normally distributed, what percentage of the battery cells are expected to have life **(15)**

i) more than15 hours ?
ii) less than 6 hours ?
iii) between 10 and 14 hours ?

Q.9 There are two identical boxes containing 4 white and 3 red balls & 3 white and 7 red balls respectively. A box is chosen at random and a ball is drawn from it. If a ball is white, what is the probability that it is from the first box ? **(15)**

Q.10 Define Normal Distribution with suitable example and explain its characteristics. **(15)**

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