

F.Y.B.SC. SEM – I (2014 COURSE) : SUMMER - 2018
SUBJECT: STATISTICS : DISCRETE PROBABILITY AND PROBABILITY
DISTRIBUTIONS – I (S – 12)

Day: **Monday**
Date: **23/04/2018**

S-2018-0685

Time: **12.00 NOON TO 02.00 PM**
Max Marks. 40

N.B.

- 1) All questions are **COMPULSORY**.
 - 2) Figures to the right indicate **FULL** marks.
 - 3) Draw neat and labeled diagrams **WHEREVER** necessary.
 - 4) Use on algorithmic table, statistical table and pocket **CALCULATOR** is allowed.
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Q.1 Attempt any **TWO** of the following: **(10)**

- a) Explain the term Non-deterministic model with two illustrations.
- b) A fair coin is tossed three times, find the probability to observe at least one head.
- c) Let $\Omega = \{ w_1, w_2, \dots, w_5 \}$ be a finite sample space of a random experiment with probability model as $P(w_1) = k$; $P(w_2) = 2k$; $P(w_3) = 3k$; $P(w_4) = 4k$; $P(w_5) = 5k$. find the value of k .

Q.2 Attempt any **TWO** of the following: **(10)**

- a) State the important properties of distribution function.
- b) A discrete random variable (r.v) X has the following probability distribution:

X	-1	0	1	2	3
P[X = x]	0.1	0.2	0.3	0.25	0.15

Find

- i) $P[X > 1]$,
 - ii) $P[-1 < X < 3]$,
 - iii) $P[X > 0 | X < 3]$
- c) Let X be a discrete r.v. with p. m. f. given below:
 $P[X = x] = Cx, \quad x = 1, 2, 3, 4.$
 $= 0 \quad ; \quad \text{otherwise.}$
Find the value of C and mean of X .

Q.3 Attempt any **TWO** of the following: **(10)**

- a) Define binomial distribution. State any three real life examples for it.

P.T.O.

- b) Let $X \rightarrow H (N = 8, M = 3, n = 4)$. Find :
- i) $P [X = 0]$,
 - ii) $P [X > 1]$,
 - iii) Mean of X
- c) Let X takes values $1, 2, 3, \dots, n$ with equal probabilities. Find mean and variance of X

Q.4 Attempt any **FIVE** of the following : **(10)**

- a) State classical definition of probability.
- b) If $E [X] = 2$ then find $E [2X + 1]$.
- c) If $P [A] = 0.2$ and $P [B] = 0.4$ then under independence of A and B find $P (A \cap B)$.
- d) Write the sample space for throwing two dice at a time.
- e) Obtain the mean of Bernoulli r.v. with parameter ' p '.
- f) State multiplication theorem of probability for two events.
- g) If variance of X is 4 then find the variance of $(3X + 2)$.

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