F.Y.B.SC. SEM – I (2014 COURSE) : WINTER - 2017

SUBJECT: STATISTICS : DISCRETE PROBABILITY AND PROBABILITY DISTRIBUTIONS – I (S – 12)

Day: **Friday**
Date: **03/11/2017**

W-2017-0593

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.

Q.1 Attempt any **TWO** of the following: **(10)**

a) Explain the term Sample space and Event with an illustration.

b) Two fair dice is thrown at a time. Find the probability to observe sum of upper faces equals to nine.

c) Let A and B be two events of a finite sample space with P (A) = 0.3, P (B) = 0.4 and P $(A \cap B)$ = 0.2 Compute :
- i) P (AUB)
- ii) P $(A' \cap B)$
- iii) P $(A' \cap B')$

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

a) State classical definition of probability with its limitations.

b) A discrete random variable (r.v) X has the following probability distribution:

X	-1	0	1	2	3
P[X = x]	k	2k	3k	4k	5k

Find :
i) The value k,
ii) P [-1 < X < 3],
iii) P [X > 0]

c) Let X be a discrete r.v. with p.m.f given below:

$$P[X=x]=\frac{x}{10}, \quad x=1,2,3,4.$$

$= 0$, otherwise.
Find the mean and variance of X.

P.T.O.

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

a) Define Hypergeometric distribution. Obtain its mean.

b) Let $X \rightarrow B\,(n = 10\,,\, p = 0.7)$. Find

i) $P\,[\,X = 0]$,

ii) $P\,[\,X > 1\,]$,

iii) Mode of X.

c) Let X takes values 1, 2, 3, ... n with equal probabilities. Find value of n if mean and variance of X are equal.

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

a) Define probability model on a finite sample space.

b) If Var. [X] = 4 then find Var. [2X + 1].

c) State Bayes theorem on conditional probability.

d) Write the sample space for tossing three coins a time.

e) Define mutually exclusive events with an example.

f) Define independence of two events.

g) Prove $E\,[C\,X] = C\,E\,[\,X\,]$, where C be any constant.

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