Total No. of Questions : 4]

SEAT No. :

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T.Y. B.Com.

355-F : BUSINESS STATISTICS - II

(2019 Pattern) (Semester - V)

Time : 2½ Hours] *[Max. Marks : 50*

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Figures to the right indicate full marks.***
3) ***Use of statistical table and calculator is allowed.***
4) ***Symbols have their usual meanings.***

Q1) a) Fill in the blanks (any Five) : **[1 each]**

i) A notation and formula of permutation of r objects taken from n different objects is _____.

ii) A notation and formula of combination of r objects taken from n different objects is _____

iii) Occurrence of at least one of the two events A and B defined on a sample space is denoted by _____.

iv) Variance of a constant is always equals to _____.

v) If a discrete random variable (r.v.) X $\rightarrow$ Poisson (m = 6) then variance of X is _____.

vi) If a discrete r.v.x $\rightarrow$ B (n = 10, P = 0.5) then mean of X is _____.

b) State whether following statements is true or false (any five) : **[5]**

i) If two events A and B are independent then $P(A \cap B) = 0$

ii) A discrete r.v. can not take negative values.

iii) Mean and variance of a Bernoulli distribution are equal.

iv) Mean and variance of a Poisson distribution are equal.

v) If two dimensional discrete r.v. (X - Y) are independent then joint probability distribution of (X - Y) is equal to the product of their marginal prob. distributions.

vi) For binomial distribution mean < variance.

P.T.O.

Q2) **Write short note on the following (any two) : [5 each]**

a) Define : Definations of probability using classical and axiomatic approach, Addition and multiplication law of probability.

b) Define : Bivariate discrete random variable, joint probability distribution of a bivariate discrete r.v., marginal probability distributions of a discrete r.v.

c) Define : Poisson distribution, state its real life situations, state its p.m.f., mean, variance state additive property of it.

d) Define : Meaning and necessity of inventory control Lead time, Re-order level, Buffer stock.

Q3) a) Attempt the following :

i) Four cards are drawn at random from a well shuffled pack of 52 cards. Find the probability that **[4]**

I) two cards are red & two cards are black

II) all cards are of different suits

ii) Following are the marginal probability distributions of X and of Y

X	1	2	3	Y	–1	0	1
p(x)	0.3	0.3	0.4	p(y)	0.1	0.6	0.3

Assuming X and Y are independent r.v.s., obtain joint probability distribution of (x, y). **[4]**

b) Attempt the following :

i) State Baye's theorem. **[3]**

ii) A fair coin is tossed 3 times. A person receives Rs. x^2, if he gets X number of tails in all. Find his expected grin. **[4]**

Q4) a) Attempt the following :

i) The joint p.m.f. of (X –Y) is as follows :

X \ Y	–1	0	1	2
0	0	0.1	0.1	0.2
1	0.1	0.2	0.2	0.1

Obtain conditional probability distribution of Y given (X = 0). **[4]**

ii) If X and Y are two independent poisson variates with $X \rightarrow$ Poisson(2), $Y \rightarrow$ Poisson(3) then find $P(X + Y = 0)$, $P(X + Y \leq 1)$, $E(X + Y)$, $Var(X + Y)$. **[4]**

b) Attempt the following :

i) A discrete r.v. x with p.m.f. **[4]**

$P(X = x) = kx$; $x = 1, 2, 3, 4, 5$.

$= 0$; otherwise

Find the value of constant K and E(X)

ii) Define : Deterministic inventory model, probabilistic inventory model. **[3]**

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