Total No. of Questions : 4]

SEAT No. :

**PB-1352**

[Total No. of Pages : 2

# [6224]-511

## 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 permutation is an _____ arrangements of $r$ objects taken from $n$ different objects.

ii) A combination is _____ selection of $r$ objects taken from $n$ different objects.

iii) Speed of the vehicle is _____ type random variable ($r.v$).

iv) If a discrete $r.v.$ $x \rightarrow$ Bernoulli (P = 0.5) then mean of $x$ is _____.•

v) If a discrete $r.v.$ $x \rightarrow$ Poisson (M = 3.6) then value of P($x$ = 0) is _____.

vi) Reorder level = minimum level + _____.

**B) State whether following statements is True or False.** **[5]**

i) If two events A and B are independent, then their complements A' and B' are also independent.

ii) A discrete random variable can not take negative values.

iii) Expected value of a constant is zero.

iv) Variance of a $r.v.$ is always non-negative.

v) Mean and Variance of a Poisson distribution are equal.

vi) Set up cost is the cost incured each time an order is placed.

***P.T.O.***

***Q2)*** **Write short notes on the following (Any Two) : [5 each]**

a) Define : Sure event, null event, Equally likely events, Simultaneous occurrence of the two events, occurrence of at least one of the two events.

b) Define : Bernoulli trials, probability mass function (p.m.f.) of Binomial distribution, state its mean, variance and standard-deviation (s.d.)

c) Define Poisson distribution, state its p.m.f., mean, variance, s.d., state its additive property.

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

***Q3)*** a) Attempt the following :

i) Obtain the probability distribution of the number of sixes in two tosses of a die. Also obtain expected value of no. of sixes. **[4]**

ii) The joint p.m.f. of $(x - y)$ is as follows :

| $x$ \ $y$ | 0 | 1 | 2 |
|---|---|---|---|
| –1 | 0.1 | 0.2 | 0.3 |
| 1 | 0.1 | 0.1 | 0.2 |

Obtain conditional probability distribution of $x$ given $(y = 0)$. **[4]**

b) Attempt the following :

i) If $x \rightarrow$ Poisson $(m)$ with $p(x = 1) = 2.\ p(x = 2)$ then find p.m.f. of $x$. Also state its mean and variance. **[4]**

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

***Q4)*** a) Attempt the following :

i) If $x$ and $y$ are two independent binomial variates with $x \rightarrow B\left(5, \frac{1}{2}\right), y \rightarrow B\left(4, \frac{1}{2}\right)$ then find $p(x+y=0)$, $p\left(\frac{x+y}{2} \geq 3\right)$, $p(3(x+y) \leq 6)$. **[4]**

ii) The joint p.m.f. of $(x - y)$ is as follows :

| $(x, y)$ | (0, –1) | (0, 1) | (1 –1) | (1, 1) |
|---|---|---|---|---|
| $p(x, y)$ | 2/25 | 3/25 | 8/25 | 12/25 |

Are $x$ & $y$ independent? **[4]**

b) Attempt the following :

i) Obtain the expected value of number of heads when three fair coin is tossed simultaneously. **[4]**

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

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