SEAT No. : $\square$

## [5952]-511

T.Y. B.Com. (Semester - V) STATISTICS

# 355 (F) : Business Statistics - II <br> (2019 Pattern) (CBCS) 

Time : $2^{1 ⁄ 2} / 2$ 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 tables \& calculaton is allowed.

Q1) Attempt the following:
A) Choose the correct alternative of the following (any five): [5 $\times 1=5]$
i) The number of ways in which 5 women $\& 3$ men are to be seated at a round table so that no two men are to sit together is :
a) 1460 ways
b) 1440 ways
c) 1420 ways
d) 1410 ways
ii) Let $X \sim \operatorname{Binomial}(n, p)$ then mean of $X$ is
a) $n$
b) $n p$
c) npq
d) pq
iii) Economic Order Quantity is the tool for controlling $\qquad$ .
a) Inventory
b) Labor
c) Expenses
d) None
iv) In how many ways 2 students can be chosen from the class of 20 students?
a) 190
b) 180
c) 240
d) 390
$v$ ) If $m$ is the mean of poisson distribution then variance is given by
$\qquad$ _.
a) $\mathrm{m}^{2}$
b) m
c) $m / 2$
d) $\mathrm{m}^{1 / 2}$
vi) How many outcomes can a Bernoulli trials have?
a) 3
b) 2
c) 5
d) $\quad 2^{n}$
vii) An event in the probability that will never be happen is called as
a) Unsure event
b) Sure event
c) Possible event
d) Impossible event
B) State whether the following statements are TRUE or FALSE:[5 $\times \mathbf{1}=5]$
i) Probability is always lies between $0 \& 1$.
ii) Poisson variable has countably infinite values.
iii) $p(\phi)=0$
iv) Marginal probability of $x$ is a univariate probability distribution.
v) Under certain situations, binomial distribution can be approximated by poisson distribution.

Q2) Write short note (any two) :
A) Univariate probability distribution
B) Inventory control
C) Poisson distribution
D) Random variable

Q3) A) a) A discrete random variable $x$ has the following probability distribution

| $x$ | 0 | 1 | 2 | 4 |
| :---: | :---: | :---: | :---: | :---: |
| $p(\mathrm{X}=x)$ | $4 / 10$ | k | $2 / 10$ | $2 / 10$ |

Find:
i) k
ii) variance (x)
b) The probability of defective bolt is 0.1 let $x$ denotes the number of detective bolts in a box of 20 bolts. Find the probability that the defective bolts will be
i) at least two
ii) at most three
B) a) Explain :
i) Event
ii) Complementary Event
iii) Independence of two descrete random variables
iv) Conditional probability of event $A$ for given event $B$.
b) If $\mathrm{A} \& \mathrm{~B}$ are any two events with $\mathrm{P}(\mathrm{A} / \mathrm{B})=0.8 \& \mathrm{P}(\mathrm{B})=0.5$. Find $\mathrm{P}(\mathrm{A} \cap \mathrm{B})$.

Q4) A) a) A dealer supplies the following information with respect to a product.

## Annual Demand - 1000

Ordering Cost - 10 Rs. per order
Price per unit - 20 Rs.
Inventory carrying cost - 20\%
Back-order cost - 25\%
Determine:
i) EOQ
ii) Optimal number of orders
b) For the following bivariate probability distribution of X \& Y:

| X | 1 | 2 | 3 | 4 | 5 | 6 |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: |
| 0 | 0 | 0 | $1 / 32$ | $2 / 32$ | $2 / 32$ | $3 / 32$ |
| 1 | $1 / 16$ | $1 / 16$ | $1 / 8$ | $1 / 8$ | $1 / 8$ | $1 / 8$ |
| 2 | $1 / 32$ | $1 / 32$ | $1 / 64$ | $1 / 64$ | 0 | $2 / 64$ |

Find :
i) $\quad \mathrm{P}(\mathrm{X} \leq 1, \mathrm{Y}=2)$
ii) $\quad \mathrm{P}(\mathrm{X} \leq 1)$
iii) $\mathrm{P}(\mathrm{Y}=3)$
iv) $\mathrm{P}(\mathrm{Y} \leq 3)$
B) a) A bag contain 10 balls, two of which are red, three blue \& five black, three balls are drawn at random from the bag. What is the probability that:
i) The three balls are different colours.
ii) Exactly two balls of the same colours.
b) If poisson distribution probabilities are $p(x=1)=2 p(x=2)$. Find mean \& variance.

