MAY-010-001307 Seat No. _____

# B. B. A. (Sem. III) (CBCS) Examination

**November/December – 2016**

## Business Statistics-I

*(New Course)*

**Faculty Code : 010**
**Subject Code : 001307**

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

**Instructions :** (1) Attempt all questions.
(2) Figures to the right side indicate marks.

**1** (a) Prove that $P(A \cup B) = P(A) + P(B) - P(A \cap B)$. **7**

(b) An urn contains 10 white and 3 red balls. **7**
Another urn contains 3 white and 5 red balls. Two balls are transferred from the first urn and placed in the second urn and then one ball is taken from the second urn. What is probability that it is white ball ?

**OR**

**1** (a) Explain the following : **7**
(1) Independent events
(2) Conditional Probability
(3) Mutually exclusive events.

(b) If $A$ and $B$ be two events such that $P(A' \cap B') = \frac{1}{8}$, **7**

$P(A' \cup B') = \frac{3}{4}$ and $P(A) = \frac{3}{8}$ then find $P(B)$ and $P(B/A)$.

**2** (a) Prove that E(XY) = E(X)·E(Y) **7**

(b) For a normal distribution with mean 50 and S.D. 15. **7**
Find $Q_1$, $Q_3$, quartile deviation and mean deviation.

**OR**

2 (a) State properties of Normal distribution. 7

(b) The prob. distribution of a discrete random variable $x$ is as under : 7

| $x$ : | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|
| $P(x)$: | 0 | K | 2K | 2K | 3K | $K^2$ | $2K^2$ | $7K^2 + K$ |

Find value of K, Mean and Variance.

3 (a) Prove that Mean and Variance of a binomial distribution. 7

(b) The following mistakes per page were observed in a book : 7

| No. of mistakes per page : | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| No. of times the mistake occurred: | 211 | 90 | 19 | 5 | 0 |

Fit a Poisson distribution to the data.

**OR**

3 (a) Prove that Mean and Variance of a Poisson distribution. 7

(b) For a binomial distribution mean is 3 and variance is 6/5 then find the prob. of getting at least one success. 7

4 (a) Explain : Elements of Decision Problem. 7

(b) For the following pay-off matrix find the best act using 7

(1) Laplace principle

(2) Horwich principle $(\alpha = 0.7)$

(3) Maximax principle

| Event | Act | | | | |
|---|---|---|---|---|---|
| | $A_1$ | $A_2$ | $A_3$ | $A_4$ | $A_5$ |
| $S_1$ | 10 | 25 | 10 | 15 | 20 |
| $S_2$ | –5 | 10 | –5 | –10 | –5 |
| $S_3$ | 15 | 5 | 10 | 10 | 10 |

**OR**

4 (a) Explain the following terms : 7

Horwich principle, Maximax principle.

(b) Find EVPI 7

| State of nature | Prob. | Act | | |
|---|---|---|---|---|
| | | $A_1$ | $A_2$ | $A_3$ |
| $S_1$ | 0.2 | 20 | –10 | –30 |
| $S_2$ | 0.3 | 25 | 30 | –50 |
| $S_3$ | 0.5 | 30 | 50 | 60 |

5 (a) What is stratified sampling ? Give its advantages and limitations. 7

(b) Give the advantages of sampling. 7

**OR**

5 (a) Explain types of Estimates and properties of good Estimator. 7

(b) Write on Standard Error of a statistic and its uses. 7