

Total No. of Questions : 6]

SEAT No. :

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[5956]-203

M.Com.- I

BUSINESS STATISTICS (202- B)
(2019 Pattern) (Semester - II)

Time : 3 Hours]

[Max. Marks : 60

Instructions to the candidates:

- 1) *Q.1 and Q.6 are compulsory.*
- 2) *Answer any three questions from Q.2 to Q.5*
- 3) *Figures to the right side indicate full marks.*
- 4) *Use of statistical table and calculator is allowed.*

Q1) Choose the correct alternatives from each of the following. (Any 6) **[6]**

- a) Prosperity, Regression & depression in a business is an example of_____
- | | |
|---------------------|--------------------|
| i) Irregular trend | ii) Secular trend |
| iii) Cyclical trend | iv) Seasonal trend |
- b) A set of observations recorded at an equal interval of time is called_____
- | | |
|-----------------------|----------------------|
| i) Array Data | ii) Data |
| iii) Geometric series | iv) Time series data |
- c) If x is a continuous random variable then $\text{var}(5-3x)$ is_____
- | | |
|-------------------------|--------------------------------------|
| i) $-3 \text{ var}(x)$ | ii) $9 \text{ var}(x)$ |
| iii) $2 \text{ var}(x)$ | iv) $\text{Var}(5)-3 \text{ var}(x)$ |
- d) Relation between mean & variance in poisson distribution is_____
- | | |
|----------------------|-----------------------|
| i) Mean = variance | ii) Mean < variance |
| iii) Mean > variance | iv) Mean = 2 variance |
- e) Example of discrete random variable is_____
- | | |
|-------------------------|------------------------|
| i) No. of accidents | ii) Height of students |
| iii) Weight of students | iv) Temp. of cities |
- f) A function of sample values is known as_____
- | | |
|--------------|---------------------------|
| i) Statistic | ii) Level of significance |
| iii) Sample | iv) Parameter |

P.T.O.

- g) The rejection probability of Null hypothesis when it is true is called as_____
- i) Level of confidence ii) Level of significance
 iii) Level of acceptance iv) Level of rejection
- h) Test of hypothesis $H_0 : \mu = 50$ against $H_1 : \mu > 50$ leads to_____
- i) Left tailed test ii) Right tailed test
 iii) Two-tailed test iv) Difficult to tell

Q2) Attempt each of the following.

- a) Compute 4 yearly centered moving averages for the following data. [5]

Year	1989	1990	1991	1992	1993	1994	1995
Profit In Rs.000	90	100	102	93	104	109	102

- b) Fit a linear trend line to the following time series by the least square method. [5]

Year	1998	1999	2000	2001	2002
Production	12	20	28	32	50

- c) Define each of the following. [2×2=4]

- i) Time series
 ii) Components of time series

Q3) Attempt each of the following. [5]

- a) consider the function

$$P(x) = k(x^2 + 4), \quad x = 0, 1, 2, 3$$

$$= 0, \quad \text{otherwise}$$

- i) Find the value of K
 ii) Find the value of mode of x
 iii) Find $E(x)$ & $\text{var}(x)$

- b) Define Probability density function of a continuous random variable, Also verify whether the following function can be considered as a valid probability density function. [5]

$$f(x) = \frac{3x(2-x)}{4}, 0 \leq x \leq 2$$

$$= 0, \text{ otherwise}$$

- c) Define each of the following. [4]
- Random variable
 - Discrete random variable
 - Expectation of discrete random variable

Q4) Attempt each of the following.

- Let x be a binomial random variable with mean 1 and variance $3/4$. Find n , p , q and $p(x=3)$ [5]
- Let x is normally distributed random variable with parameter $(5,4)$ find [5]
 $P(x \leq 5)$, $P(x \geq 5)$ and $P(3 \leq x \leq 7)$
- Define exponential distribution. Also state it's mean, variance and standard deviation. [4]

Q5) Attempt each of the following.

- Some individuals were classified according to gender and colourblindness as follows.

Gender \ Eye-sight	Male	Female
Normal	442	512
colour-blind	30	04

Test whether there is any association between the two attributes. Use 5% l. o. s [5]

- b) A random sample of 10 boys had the following I.Q' 70,120, 110, 101, 88, 83, 95, 88, 107, 100. Does these data support the assumption that population mean I.Q is 100? [use $\alpha = 5\%$] [5]
- c) Define the term [4]
- i) Null hypothesis
 - ii) Alternative hypothesis
 - iii) Level of significance
 - iv) Critical region

Q6) Attempt any two of the following [2×6=12]

- a) Define Joint, Marginal and conditional distributions.
- b) Explain chi-square test of "goodness of fit".
- c) Define normal distribution, state it's mean, variance, mode and median. Define standard normal variable.
- d) Explain exponential smoothing of estimating the trend values in a time series.

