

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 7105 Roll No.

Or

- (a) What is the major purpose of hypothesis testing?
 (b) The following information is obtained concerning an investigation of 50 ordinary shops of small size :

Organisation run by	Shops Located in	
	Urban area	Rural area
Men	17	18
Women	3	12

Can it be inferred that shops run by women are relatively more in rural areas than in urban areas? Use Chi-square test.

Extract from χ^2 - Table

Degrees of freedom	1	2	3	4	5
$\chi^2_{.05}$	3.841	5.991	7.815	9.488	11.070

M.B.A.

(Semester-I) Theory Examination, 2011-12
 BUSINESS STATISTICS

Time : 3 Hours]

[Total Marks : 100

Note : Attempt questions from each Section as indicated.

Section-A

1. Following are ten parts of this question, attempt *all* parts. The answers are expected to be in 50 to 75 words :

2×10=20

- (a) Bring out the applications of Statistics in managerial decision-making.

- (b) Distinguish between Skewness and Kurtosis.
- (c) What is a Time Series?
- (d) What are the uses of Index Numbers?
- (e) Prove that Karl Pearson coefficient of correlation lies between -1 and $+1$.
- (f) Why there are two regression lines?
- (g) Define mutually exclusive events. Give illustration.
- (h) What is Bernoulli experiment?
- (i) Find mean of Poisson distribution.
- (j) Distinguish between partial and multiple correlation.

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Section-B

2. Following are five parts, attempt any *three* parts. The answers are expected to be in 100 to 200 words :

$10 \times 3 = 30$

- (a) Lives of two models of Laptops in a recent survey are :

Life (in months)	No. of Laptops	
	Model - A	Model - B
0-5	2	2
5-10	4	7
10-15	6	10
15-20	5	8
20-25	3	3

- (i) What is the average life of each model of these Laptops?
- (ii) Which model has better uniformity?

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- (b) The following data relates to sales of Hindustan Bajaj Ltd :

Year	Sales (₹ Lakhs)
2007	40
2008	50
2009	80
2010	110
2011	140

Fit a straight line trend by the method of least squares.

- (c) Write a lucid note on Spearman Rank correlation coefficient.
- (d) A can hit a target 3 times in 5 shots. B 2 times in 5 shots, and C 3 times in 4 shots. They fire a volley. What is the probability of hitting 2 shots ?
- (e) Write a note of association of attributes.

Section-C

Following are five questions with internal choice, attempt *all* questions. The answers are expected to be in 300 to 500 words.

10×5=50

3. "Measure of Central tendency, dispersion and skewness are complementary to one another in understanding a frequency distribution." Elucidate.

Or

What are the measures of dispersion ? Why is the standard deviation considered to be the most reliable measure of dispersion ? Calculate standard deviation from the following data :

Age (in years)	No. of Students
4-6	30
6-8	40
8-10	50
10-12	60
12-14	40
14-16	30
16-18	20
18-20	10

4. What is a Time Series ? Explain the various components of a time series.

Or

Distinguish between correlation and regression.

Derive regression lines for the following data :

$$\Sigma x=30, \Sigma x^2=190, \Sigma xy=192, \Sigma y=30, \Sigma y^2=190$$

and $n=5$.

5. What are the conditions necessary for a normal distribution to occur ? With the help of a suitable diagram, list the chief properties of a normal distribution.

Or

The monthly mess bill of a student who is staying in a hostel follow a normal distribution with a mean of ₹ 2000 and a standard deviation of ₹ 200. What is the probability that in the next month his bill will go above ₹ 2400 ?

Extract from Z distribution

Z	0.5000	1.0000	1.5000	2.0000	2.5000
Area	0.1915	0.3413	0.4332	0.4772	0.4938

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6. (a) What are Factor and Time Reversal Tests ? Explain.
(b) Distinguish between chain base and fixed base indices.

Or

Explain:

- (a) Steps involved in designing a test of significance
(b) Null and Alternate hypothesis
(c) Critical region
(d) Type II error.
7. (a) Describe the usefulness of analysis of variance technique in business decisions.
(b) Two types of batteries are tested for their length of life and the following results are obtained :

Battery	Sample Size	Mean (Hour)	Standard Deviation (Hour)
ABC	100	1000	10
XYZ	120	1050	11

Can you conclude that the two types of batteries are having the same mean life ?

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