Code: 14E00105

MBA I Semester Supplementary Examinations May 2016

BUSINESS STATISTICS

(For students admitted in 2014 and 2015 only)

Time: 3 hours Max. Marks: 60

Issue of T, F, χ^2, Z values tables at 5% level of significance are permitted in the examination hall

All questions carry equal marks

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SECTION – A

Answer the following: (05 X 10 = 50 Marks)

1 What are the various measures of central tendency? Describe their relative merits, demerits and their uses.

OR

2 Calculate the standard deviation and variance for the data given below:

X	10	11	12	13	14	15
f	8	10	16	20	4	2

3 What is coefficient of correlation? Discuss the significance and types of correlation.

OR

4 A company believes that the number of sales persons employed is a good predictor of sales. The following table exhibits sales (in thousand rupees) and number of sales persons employed for different years.

Sales (in thousand rupees)	120	125	118	115	100	130	140	135	130	123
Number of sales persons employed	10	15	12	18	20	21	22	20	15	19

Develop a simple regression model to predict sales based on the number of sales persons employed.

5 Write briefly about the following:

(a) Mutually exclusive events. (b) Collectively exhaustive events. (c) Equally likely events.

OR

6 A company accepted a lot of 70 picture tubes of a colour television. Out of the 70 picture tubes, 10 are defective.

(i) If two picture tubes are drawn at random, one at a time without replacement, what is the probability that both the picture tubes are defective?

(ii) If two picture tubes are drawn at random, one at a time with replacement, what is the probability that both the picture tubes are defective?

7 Distinguish between the following:

(a) Null hypothesis and alternative hypothesis. (b) Type I error and Type II error. (c) Z-test and t – test.

OR

8 A company is in the process of launching a new product. Before launching, the company wants to ascertain in status of its product as a second alternative. For doing so, the company prepared a questionnaire consisting of 20 questions on a five-point rating scale with 1 being “strongly disagree” and being “strongly agreed”. The company administered this questionnaire to 8 randomly selected respondents from five potential sales zones. The scores obtained from the respondents are given in the table. Use one-way ANOVA to analyze the significant difference in the scores. Take 90% as the confidence level.

Sales Zone 1	Sales Zone 2	Sales Zone 3	Sales Zone 4	Sales Zone 5
65	70	63	70	65
67	65	65	60	64
68	68	65	62	67
70	67	67	63	68
66	65	68	65	62
64	68	63	67	65
63	67	62	68	67
60	62	60	62	68

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9 What is the importance of χ^2 distribution in decision making? Explain the conceptual frame work of $\chi^2 - test$ with respect to expected and observed frequencies.

OR

10 The production manager of a printing paper company believes that at least 15% of the products are defective. For testing his belief, he takes a random sample of 100 products and finds that 20 pieces are defective. Taking 95% as the confidence level, use χ^2 goodness-of-it test to test the hypothesis.

SECTION – B

(Compulsory Question) 01 X 10 = 10 Marks

11 **Case study:**

Chhattisgarh steel and iron mill is a leading steel rod manufacturing company of Chhattisgarh. The company produces 8-meters long steel rods, which are used in the construction of buildings. The company has four machines which manufacture steel rods in three shifts. The company's quality control officer wants to test whether there is any difference in the average length of the iron rods by shifts or by machines. Data given in the following table is organized by machines and shifts obtained through a random sampling process. Employ a two-way analysis of variance and determine whether there are any significant differences in effects. Take $\alpha = 0.05$.

Length of the iron rod in different shifts and produced by different machines

Machines	Length of the iron rod		
	Shift 1	Shift 2	Shift 3
1	8.12	8.11	8.04
	8.01	8.12	8.06
	8.05	8.06	8.11
2	7.98	7.88	7.89
	7.89	7.77	7.96
	7.99	7.95	7.98
3	8.22	8.24	8.17
	8.25	8.20	8.19
	8.26	8.18	8.16
4	7.79	7.88	7.73
	7.75	7.77	7.74
	7.73	7.72	7.71

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