



Institute of Management
JK Lakshmipat University
Jaipur

END TERM EXAMINATION 2015



MBA (FT) Sem-I
MM: 50 Marks

Course: Statistics for Managers
Time: 3 Hours
Subject code: MBA105.....

Instructions: Attempt any three questions from Section A. Section B is compulsory.

Section A (10+10+10=30 marks)

Q1. A media house has started telecasting a new TV channel. They are interested in obtaining an interval estimate of the mean time that household viewers spend on watching the channel daily. They have conducted a pilot survey using 64 household viewers and found that the average daily time spent is 105 minutes with a standard deviation of 25 minutes. Using this pilot survey findings, help the media house determine the sample size it should use in order to develop a 99% confidence interval for the true mean such that this interval has a total width of only 5 minutes. Assuming that the new sample survey yields the same results for mean time (105 minutes) and standard deviation (25 minutes), compute the 90% and 95% confidence intervals for mean time spent daily on the channel by household viewers?
---(10 marks)

Q2. A recent poll done on 2000 LPG domestic consumers reports that 1253 of them support the idea of voluntarily giving up the government provided subsidy.

a) Find the 95% confidence interval for p , the proportion of all LPG domestic consumers that support the idea of giving up subsidy.
---(5 marks)

b) Perform a hypothesis test using a significance level of 1% to check if more than 60% domestic LPG consumers support giving up subsidy.
---(5 marks)

Q3. Students in two samples taken from two different groups of schools were administered a standard scholastic ability test. Marks indicating scholastic ability as obtained by the students are tabulated below:

Group 1	18	20	36	50	49	36	34	49	41
Group 2	29	28	26	35	30	44	46		

Does the data show dissimilar average scholastic ability for students of the two groups of schools? (Hint: Assume that variance in scholastic ability is same in both groups.)
---(10 marks)

Q4. A large corporation is contemplating purchasing more ergonomic desks for their typist pool but only if the new furniture could lead to better productivity (typing speed). A sample of 9 typists were allowed use of the new furniture (desk B) and their typing speed (in words per minute) measured to compare with their earlier speed while using existing furniture (desk A). Given the data below, what analysis can be done to help decide the matter? ---(10 marks)

Typist	A	B	C	D	E	F	G	H	I
desk A	42	37	44	35	36	36	40	35	37
desk B	45	41	46	38	34	40	37	37	42

Q5. a) Below is an observed frequency distribution:

Value Range	≤ 2.59	2.60-3.79	3.80-4.99	5.00-6.19	6.20-7.39	≥ 7.40
Frequency	6	30	41	52	12	9

Using a normal distribution with $\mu = 5$ and $\sigma = 1.5$, a) find the probability of falling in each value range category, and b) use these probabilities to compute the expected frequency of each value range category in the given distribution, and then, c) at the 10% level of significance, check if the observed frequency distribution seems to be well described by the suggested normal distribution.
---(5 marks)

b) Survey of the capital structure (debt-equity ratio) of a group of firms with assets of varied amounts (divided into three categories) breaks them into two classes as tabulated below:

	Firm Asset Size (in Rs. crores)			
	< 500	500-2000	2000+	Total
Debt less than equity	7	10	8	25
Debt greater than equity	10	18	9	37
Total	17	28	17	62

Do all 3 firm size categories have same capital structure? (Use 10% significance level to check.) ---(5 marks)

Section B (10x2=20 marks)

Q6. Attempt any ten of the sub-parts (a) to (o) below. All sub-parts carry 2 marks each. ---(20 marks).

- a) What are random variables? Give an example each of discrete and continuous random variables.
- b) What are probability distribution functions? Give an example each of discrete and continuous probability density functions.
- c) What is "sampling"? Explain its importance for managers?
- d) What do you understand by the term "sampling distribution"? Explain using an example.
- e) What does the term "standard error" denote? Does it have any relation to the term "sampling error"?
- f) What is the Central Limit Theorem? Explain its significance.
- g) What do you understand by the terms "point estimate" and "interval estimate"? Illustrate through examples.
- h) What do you understand by the terms "confidence interval" and "confidence level"? Illustrate through examples.
- i) What do you understand by the term "testing of hypotheses"? Explain what are "null hypothesis" and "alternative hypothesis"?
- j) What is implied by "one-tailed" and "two-tailed" tests of hypotheses?
- k) What is meant by Type I and Type II errors in the context of hypotheses testing?
- l) Explain the meanings of "level of significance" and "power of test" in connection with hypothesis testing.
- m) In the study or examination of phenomena involving categorical variables, how can a "contingency table" be setup and used to classify the observed data? Explain using an example.
- n) Explain how to carry out chi-square tests for "goodness-of-fit".
- o) What is the difference between chi-square test for independence and chi-square test for homogeneity?
