

Exam. Code : 217601

Subject Code : 6891

M.Com. Ist Semester

STATISTICAL ANALYSIS FOR BUSINESS

Paper—MC-102

Time Allowed—3 Hours]

[Maximum Marks—60

Note :- Attempt 10 questions from Section A. Each question carries 2 marks. Attempt 2 questions each from Sections B and C. Each question carries 10 marks.

SECTION—A

1. Enlist the assumptions for the application of t test.
2. Briefly explain the procedure for testing of hypothesis.
3. What do you mean by Alternate Hypothesis ? How does a researcher select an Alternate Hypothesis ?
4. Define and explain the meaning of Multiple Correlation. When is it used ?
5. What is meant by 'Pretesting' of a questionnaire ? Explain the significance of the same.
6. What is meant by 'Stratified Sampling'? Explain the usage and limitations of the same.
7. What is understood by 'Sampling Frame'? How does a researcher determine the sampling frame to be used ?
8. Define and explain 'Mutually Exclusive Events'.
9. Explain the Observation method of data collection, along with its application and utility.
10. What is a Normal Distribution ? What are the characteristics of the same ?
11. What is Binomial Distribution ? Discuss the conditions for the application of the same.
12. Explain, Double Barreled questions in a questionnaire. Also give suitable example/s for the same. $2 \times 10 = 20$

1. (a) Discuss the various Laws of Probability. 4
- (b) Military radar and missile detection systems are designated to warn a country of an enemy attack. A reliability question is whether a detection system will be able to identify an attack and issue a warning. Assume that a particular detection system has a .90 probability of detecting a missile attack. Use the binomial probability distribution to answer the following questions.
- (i) What is the probability that a single detection system will detect an attack ?
 - (ii) If two detection systems are installed in the same area and operate independently, what is the probability that at least one of the systems will detect the attack ?
 - (iii) If three systems are installed, what is the probability that at least one of the systems will detect the attack ?
 - (iv) Would you recommend that multiple detection system be used ? Explain. 6
2. Explain the various types of Non Probability Sampling Techniques ? How do Probability Sampling techniques differ from the Non-Probability ones ? Identify a situation where in a Non Probability Sampling method would be followed by a researcher over the Probability method. 10
3. What is meant by Secondary Data ? Describe the various Syndicated sources of Secondary Data. 10
4. (a) In an examination, 30% of the students have failed in Mathematics, 20% of the students have failed in Chemistry and 10% have failed in both Mathematics and Chemistry. A student is selected at random :
- (i) What is the probability that the student has failed in Mathematics, if it is known that he has failed in Chemistry ?

(ii) What is the probability that the student has failed in either Mathematics or Chemistry ? 5

(b) In a large group of men, it is found that 5% are under 60 inches and 40% are between 60 and 65 inches in height. Assuming the distribution to be exactly normal, find the mean and standard deviation of the height. For the area of the standard normal curve 0.05 and 0.045 between 0 and a specified value, the z values are approximately 0.125 and 1.645 respectively. 5

SECTION—C

1. A leading shoe manufacturer has 500 showrooms across the country. The company wants to know the average difference in sales of these showrooms. It also wants to know the average sales difference between salesmen. For ascertaining the productivity of different salesmen, the company has adopted a practice of retaining one salesman for three months at one showroom. The company randomly selected five showrooms and five salesmen from each of the showrooms. The table given below exhibits the average sales (in thousand rupees) from showrooms and the individual contribution of the five salesmen placed at different showrooms.

Salesmen	Showrooms				
	Showroom 1	Showroom 2	Showroom 3	Showroom 4	Showroom 5
Salesman 1	55	72	45	85	50
Salesman 2	56	70	50	88	49
Salesman 3	58	68	55	89	45
Salesman 4	60	70	42	90	42
Salesman 5	62	73	41	91	40

Examine :

(a) Whether the salesmen significantly differ in productivity.

- (b) Whether there is a significant difference between the average sales of showrooms ? Take 99% confidence level for testing the hypothesis. 10
2. (a) A manufacturer of ball-point pens claims that a certain pen he manufactures has a mean writing life of 400 pages with a standard deviation of 20 pages. A purchasing agent selects a sample of 100 pens and puts them for test. The mean writing life for the sample was 390 pages. Should the purchasing agent reject the manufacturer's claim at 5% level ? 5
- (b) In a Departmental store, 380 customers out of a random sample of 800 customers were found to be using Visa credit card. Discuss whether this information supports the view that the majority of customers of store are using cards other than Visa. 5
3. How can a questionnaire be used as a research tool ? What precautions should a researcher take while wording the questions ? Explain the relevance of questionnaire layout in affecting the response rate of the respondents. 10
4. Using the table given below, calculate Karl Pearson's Coefficient of correlation :

Price	14	16	17	18	19	20	21	22	23
Demand	84	78	70	75	66	67	62	58	60

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