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First Semester MBA Degree Examination, June/July 2014
Quantitative Methods – I

Time: 3 hrs.

Max. Marks:100

Note: 1. Answer any THREE full questions from Q1 to Q6.
2. Question Q7 and Q8 are compulsory.

- 1 a. What is sampling? (03 Marks)
 b. Differentiate exploratory research and descriptive research. (07 Marks)
 c. Describe the primary scaling techniques used in business research studies. (10 Marks)
- 2 a. What is the importance of literature? (03 Marks)
 b. Find the missing frequency if the value of arithmetic mean is 33. (07 Marks)

Hourly wage	10	12	60	70	40
Number of workers	5	10	?	2	5

- c. The following table gives the age of cars of a certain make and annual maintenance costs. Estimate the maintenance cost of a 7 year old car.

Age of cars (in years)	2	4	6	8
Maintenance cost (in hundreds of Rs.)	10	20	25	30

(10 Marks)

- 3 a. Mention any three properties of arithmetic mean. (03 Marks)
 b. The management of a photograph record company has discovered that the number of defects on records appears to follow a Poisson distribution with a mean equal to 0.4
 i) What is the probability that a record selected at random will have three defects?
 ii) If management sets a policy that records sold to customers must not have any defects. What percent of its record production will not be made available for sales due to defects? (07 Marks)
 c. 2000 students of a college are graded according to their IQ and economic condition.

Economic Condition	IQ levels		
	High	Medium	Low
Rich	320	600	280
Poor	280	200	320

Test whether there is any association between economic condition and IQ levels. (10 Marks)

- 4 a. What is the difference between primary and secondary data? Explain. (05 Marks)
 b. For a moderately skewed data, the arithmetic mean is 200, the coefficient of variation is 8 and Kare Pearson's coefficient of skewness is 0.3. Find the mode and median. (05 Marks)
 c. Nicotine content in milligrams in two samples of tobacco were found as follows :

Sample A :	24	27	26	23	25	
Sample B :	27	30	28	31	22	36

Test at 5% level and significance if

- (i) Sample B has more Nicotine content than A.
 (ii) Both samples have same variance.

[$t_{9, 0.05} = 1.833$, $F_{5, 4, 0.05} = 6.26$]

(10 Marks)

- 5 a. In a survey of 400 parts manufactured by a company, the number of defective parts was found to be 30. The company however claimed that atmost 5% of their product is defective. Test the company's claim at 5% level of significance [$Z_{0.05} = 1.645$]. (03 Marks)
- b. A manufacturing firm produces pipes in two plants I and II the daily production being 1500 and 2000 pipes respectively. The fraction defective of pipes produced by the plants I and II are 0.006 and 0.008 respectively. if a pipe selected at random is found to be defective, what is the probability that it has come from plant I? (07 Marks)
- c. Find the three quartiles, 7th decile and 84th per centile from the following data :

Wages (Rs.)	30 – 40	40 – 50	50 – 60	60 – 70	70 – 80	80 – 90	90 – 100
No. of persons	1	3	11	21	43	21	9

(10 Marks)

- 6 a. A financial analyst wanted to find, out whether inventory turnover influence any company's earnings per share (in%). A random sample of 7 companies listed in stock exchange were selected and the following data was recorded.

Company	A	B	C	D	E	F	G
Inventory turnover	4	5	7	8	6	3	5
Earnings per share (%)	11	9	13	7	13	8	8

Using rank correlation, find the strength of association and interpret your findings.

(10 Marks)

- b. A tea company appoints four salesmen A, B, C and D and observes their sales in three seasons. The figures in lakhs are given in the following table :

Season	Salesman			
	A	B	C	D
Summer	36	36	21	35
Winter	28	29	31	32
Monsoon	26	28	29	29

- i) Do the salesman significantly differ in performance
- ii) Is there significant difference between the seasons [$F_{0.05(6, 2)} = 5.14$, $F_{0.05(6, 3)} = 4.76$]. (10 Marks)

- 7 a. "The effectiveness of advertisement on television of your product to be tested". Suggest the type of research. Why? (05 Marks)
- b. The hypothesis is to test whether "new education policy has resulted in more literacy rate in a particular village". Suggest the test you apply. Explain. (05 Marks)
- c. The average income of an Indian representing the income of all states is to be estimated. Which sampling procedure will give the most appropriate result? Explain. (05 Marks)
- d. A brokerage survey reports that 30% of individual investors have used a discount broker, i.e one which does not charge the full commission. To find the probability that "2 out of a random sample of 9 have used a discount broker" which probability distribution should be used? Why? (05 Marks)

- 8 a. Narrate the various steps involved in designing a questionnaire. (05 Marks)
- b. A person owns two petrol filling stations A and B. At station A, a representative sample of 200 consumers who purchase petrol was taken. The results were as follows :

Liters of petrol purchased	0 – 2	2 – 4	4 – 6	6 – 8	8 – 10	10 – 12
Number of customers	15	40	65	40	30	10

A similar sample at station B users showed a mean of 4 liters with a standard deviation of 2.2 liters. At which station is the purchase of petrol relatively more stable? (15 Marks)
