Maharshi Dayanand University,Rohtak

MBA – 1st Semester

MBA-2.14

Quantitative Methods

KENT INSTITUTE OF HIGHER EDUCATION

JULY 2005

Time : Three Hours | Maximum Marks : 70

Note : Attempt any five questions. All questions carry equal marks.

Unit-I

1. (a) What is a domain and range respect to function? Give example.
   (b) A machine is purchased at a price of Rs. 16,000. The machine is depreciated annually at the rate of 10 percent on reducing balance method. Find the value of the machine after 10 years. (Use G.P. series)

2. Solve the following system of simultaneous equations by matrix inverse method:
   X + y + z = 3
   2x – y + z =2
   x - 2y + 3z = 2

Unit-II

3. Describe the various methods of measures of variation and their relative merits.

4.Calculate BOWLEY's coefficient of skewnes for the following data:

Profit (Lakh of Rs.)(less than):	10	20	30	40	50	60	70
No. Of persons:	8	20	40	50	56	59	60

Unit-III

5. (a) Distinguish between correlation and regression
   (b) Explain the uses of time series in business.

6. Find the two lines of regression for the given data:

x:	52	63	45	36	72	65	47	25
y:	62	53	51	25	79	43	60	33

Unit-IV

7. Explain:
   (i) An experiment in respect of probability.
   (ii) Independent and Dependent events
   (iii) Mutually, exclusive events
   (iv) Bays, Theorem

8. (a) Explain the properties of Normal Distribution.

   (b) 3 percent electric bulbs manufactures by a company are defective, using poisoon distribution find the probability that a sample of 100 bulbs contains 3 or more defectives.

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Unit-I

Q:1 (a) 'X', who owes his partner 'Y' a sum of Rs. 4,000 in a business transaction, is requested by 'Y' to pay the amount in 12 daily installments. Commencing with one paise a day and twice the amount on each successive day. Considering this as a very profitable and easy device of clearing the debt, 'X' accepts it. Do you think that 'X' will gain in the bargain ? Find X's gain or loss.

(b) Firm 'X' begins production with 1,000 toys per year and decreases its production by 100 toys per year . Firm 'Y' starts with 50 toys and raises production by 25toys per year:

(i) When will be the production of firms 'X' and 'Y' are equal?

(ii) What will be the production in that year?

Q:2 (a) A man buys 8 dozens mangoes, 10 dozens of apples and 4 dozens of bananas. Mangoes cost Rs. 18 per dozen, apple Rs. 9 per dozen and bananas Rs. 6 per dozen. Represent the quantities bought by a row by a matrix and process by column matrix and hence find the total cost.

(b) A salesman has the following record of sales during 3 months for 3 items 'A', 'B' and 'C' which have different rates of commission :

Months	Sales of units			Total commission in Rs.
	A	B	C	
January	90	100	20	800
February	130	50	20	900
March	60	100	30	850

Find out the rates of commission on A, B and C.

Unit-II

Q:3 (a) A hospital administration requested a management consultant to study the amount of time a patient must wait for being treated by the emergency staff. The management consultant collected the following data during a typical day.

Waiting time in minutes

10	8	5	25	30	15	5	20	12	15	10	15
13	11	14	15	35	8	10	11	13	12		

Arrange the above data in an array from lowest to highest and construct a frequency distribution.

(b) The following incomplete table gives the number of students in different age groups of a town total being 300. If the median of the distribution is 11 years, find out the missing frequencies:

Age group	: 0-10	10-20	20-30	30-40	40-50	50-60
Frequency	: 15	125	?	66	?	4

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Q:4 Fluctuations in daily sales of two products 'X' and 'Y' are given below. Find out which of the two Shows greater fluctuations in sales :

Daily Sales of Product X	620	624	622	625	622	618	619	616	623	625	626	625	624
Daily Sales of Products Y	2152	2134	2132	2145	2132	2142	2146	2130	2146	2142	2150	2135	2152

Unit-III

Q:5 The following table gives distribution of items of production and also relatively defective items among them, according " to size of groups ". Find the correlation coefficient between size (No. of items) and defect in quality.

Size Group	15-16	16-17	17-18	18-19	19-20	20-21
No. of items	200	270	340	360	400	300
No. of defective items	150	162	170	180	180	114

Q:6 The following table relates to the tourist arrivals (in millions) during 1990 to 1996 in India:

Year	1990	1919	1992	1993	1994	1995	1996
Tourist Arrivals	18	20	23	25	24	28	30

Fit a straight line trend by the least square method and estimate the number or tourists that would arrive in the year 2001.

Unit-IV

Q:7 (a) State and prove the theorems of Probability.

(b) An insurance company insured 2000 scooter drivers, 4000 car drivers and 6000 truck drivers. The probability of accidents is 0.01, 0.03 and 0.15 respectively. One of the insured people meets an accident. What is the probability that he is a scooter driver ?

Q:8 (a) One thousand bulbs with a mean life 120 days are installed in a new factory. Their length of Life is normally distributed with standard deviation 20 days. How many bulbs will expire is less than 90 days ? If it is decided to replace all the bulbs together, what interval should be allowed between replacement if not more than 10% should expire before replacement ?

(b) In an intelligence test administered to 1000 students, the average score was 42 and standard deviation 24. Find :

(i) The number of students exceeding a score 50
(ii) The number of students lying between 30 and 54
(iii) The value of the score exceeded by top 100 students

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JAN 2008

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Unit-1

1. (a) If the 5th and 12th term of an A.P are 30 and 65 respectively, find the sum of the first 20 terms of the A.P.
   (b) Sum of three numbers in GP is 14 and sum of their square is 84, find the numbers.

2. Solve the following set of equations, using matrix notations:

$$3x + 3y + 2z = 15$$
$$2x - 4y + 5z = 9$$
$$4x + y - 3z = -3$$

Unit-II

3. (a) Explain the characteristics of a good average.
   (b) Why is standard deviation the most popular measure of variation? What are its limitations ?

4. Calculate the values of arithmetic mean, median, mode and co-efficient of quartile deviation for the following distribution:

x	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
f	2	18	30	45	35	20	6	4

Unit-III

5. Explain the following:
   a. rank correction
   b. Regression co-efficient
   c. Seasonal variations.

6. Develop the two regression equations for the following series:

x	78	36	98	25	75	82	90	62	65	39
f	84	51	91	60	68	62	86	58	53	47

Also calculate the co-efficient of correlation between the two variables.

Unit-IV

7. (a) State and explain Baye's theorem.

   (b) Describe the characteristics of normal distribution.

8. Income of 10,000 persons is normally distributed with a mean of Rs. 10,000 and standard deviation of Rs.800.00 Find the number of persons whose income is (i) less than Rs. 8,200 (ii) more than Rs. 11,500 and (iii) between Rs. 11,000 and Rs. 12,400.

   Also find the maximum income of lowest earning 20% persons.