Roll No._____

Total No of pg: 4 May-2014

MANAGEMENT PROGRAMME

MBA 104: Quantitative Techniques

Time : 3 hours Maximum Marks : 60

Note : There are three sections : Section A, Section B and Section C in this paper.

SECTION A (4x5=20)

I. ***Attempt any four questions from Section A.***

i. What is the role of mathematics and statistics in business decisions?

ii. What are index numbers and why they are called Business Barometers?

iii. Differentiate between Census and sampling.

iv. A balanced coin is tossed 4 times. Find the probability distribution of the number of heads and its Expectations.

v. List different Time series methods and their uses.

vi. What are t test and F- test. In which situation these are applied.

SECTION B (4x8=32)

Attempt one question from each UNIT.

UNIT I

II. Calculate median, 6th decile and 40^{th}, 96th percentile from the following data :

Wages per week	No. of workers
50 - 100	15
100-150	40
150-200	35
200-250	60
250-300	125
300-350	100
350-400	70
400-450	40
450-500	15

III. Find the inter quartile range from the following data :

Class Interval	Frequency
0 - 15	6
15 - 30	18
30 - 45	35
45- 60	57
60 - 75	28
75 - 90	19
90 -105	7

UNIT II

IV. The manufacturer of a spot remover claims that his product removes at least 90% of all spots. What can be concluded about his claim at the level of significance cr = 0.05, if the spot remover removed only 174 of the 200 spots chosen at random from the spots on clothes brought to a dry cleaning establishment ?.

V. To see whether silicon chip sales are independent of where the US economy is in the business cycle, data have been calculated on the weekly sales of a firm and on whether the US economy was rising to a cycle peak, at a cycle peak, falling to a cycle peak or at a cycle trough. The results are

	Weekly chip sale			
	High	Medium	Low	Total
Economy at peak	20	7	3	30
Economy at trough	30	40	30	100
Economy rising	20	8	2	30
Economy falling	30	5	5	40
Total	100	60	40	200

State the null hypothesis. At 0.10 significance level, what is your conclusion? (Given the tabulated value of test statistic is 10.645)

UNIT III

VI. The following is the heights of fathers (X), in inches and their sons (Y) :

X	66	67	67	68	69	70	72	65
Y	67	68	65	68	72	72	69	71

Obtain the equation of the line of regression of X on Y. Also find estimate of X for Y = 70.

VII. The following table gives the age of cars of a certain make and actual maintenance costs. Obtain the regression equation for costs related to age. Also estimate the maintenance cost for a ten year old car.

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

UNIT IV

VIII. Two dice, one green and the other red are thrown. Let A be the event that the sum of the points on the faces shown is odd, and B the event of at least one ace (number 1). Find the probabilities of the events

(i) AuB
(ii) AnB
(iii) A u B
(iv) (A u B)
(v) Au(AnB)

IX. Suppose that the length of time (in hours) a Philips light bulb can stay ON before burning out is normally distributed with mean p and standard deviation 10. 12 Philips bulbs are selected at random and are run until they burn out, recording how long each one lasts. The mean of these 12 bulbs is 709.5 hours. Philips claims that its bulbs have a mean lifetime of at least 718 hours. State in terms of p the hypotheses you should test to investigate this claim. Compute a 98% confidence interval for p.

SECTION C (8 marks)

X. A study by a roadways company on the effect of bus-ticket prices on the number of passengers produced the following results :

Ticket price Rs.	Passengers per 100 km
25	800
30	780
35	780
40	660
45	640
50	600
55	620
60	620

Develop the estimating equation that data. Predict the number of passengers ticket was Rs. 10. best describes the per 100 km .

-------:End:--------