G 4501

M.B.A. DEGREE EXAMINATION, MAY/JUNE 2007.

First Semester

BA 1601 — STATISTICS FOR MANAGEMENT

(Regulation 2005)

Time : Three hours   Maximum : 100 marks

Statistical tables to be permitted.

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Determine all the possible elements of a sample space when you are interested in finding out the probability in the tossing of three coins. *Unit–1*

2. If the occurrence of event B affects the probability of occurrence of event A,

   (a) How do you find the probability of occurrence of A, given that B has occurred? *Unit –1*

   (b) Suppose when the events A and B are independent how do you find P(AB).

3. Define sampling distribution. *Unit 2*

4. How do you calculate the standard error of the mean? And the standard error of the proportion? *Unit 3*

5. What do you understand by the term alternative hypothesis? *Unit 3*

6. Define one tailed test and two tailed test. *Unit–4*

7. Define level of significance and power of a test. *Unit–3*

8. Name three non parametric tests that are used for examining hypothesis about location in the case of two independent samples. *Unit–3*

9. List the different components of time series data. *Unit 5*

10. Define product moment correlation. *Unit 5*

PART B — (5 × 16 = 80 marks)

11. (a) (i) The amount of soft drink in a 12 OZ can manufactured by a company, is known to be well approximated by a normal distribution with a mean of 12 OZ and a standard deviation of 0.025 OZ.

unit - 1

      (1) What percentage of cans should have less than 11.60 OZ?

      (2) What percentage of cans will not vary by more than 0.30 OZ from the mean?

      (3) Find the probability of getting four cans that all have less than 12 OZ if a random sample of four cans is selected. (12)

unit-1 (ii) Draw the standard normal distribution and explain its characteristic? (4)

Or

(b) (i) Three machines all turn out non ferrous castings. Machine A produces 1% defective and machine B - 2% and machine C — 5%. Each machine produces 1/3 of the output. An inspector examines a single casting, which he determines as non defective? Estimate the probabilities of its having been produced by each machine. (8)

unit-1

(ii) A tree farm estimates that when an experienced serviceman plants trees, 90% survive, but when a novice plants trees, only 50% survive. If a tree previously planted fails to survive, find the probability that the novice planted it, given that novices ordinarily plant 2/3 of the trees. (8)

Prob unit1

12. (a) (i) Determine the sample size using the formula for the standard error of proportion given that

unit 2

      (1) Level of precision = ±.05

      (2) Confidence level = 95 %

      (3) Estimate of the population proportion 64%. (4)

(ii) Determine the sample size using the formula for the standard error of the means given that

      (1) Level of precision = ±5

      (2) Confidence level = 95 %

      (3) The standard deviation of the populations = 55. (4)

(iii) Explain the various sampling techniques. (8)

Or

(b) (i) Determine the confidence interval for 95% confidence limit for a sample of $n = 465$ is drawn and these observations generate a mean of 180 and a sample standard deviation of 50. (4)

unit-3

(ii) Determine the confidence interval for 95% confidence limit for a sample of size 355 that has been taken, the proportion p is calculated as 0.55. (4)

(iii) State and explain the central limit theorem with its application. (8)

13. (a) A new machine attachment would be introduced if it receives a mean of atleast 7 on a ten point scale. A sample of 20 purchase engineers is shown the attachment and asked to evaluate it. The results indicate a mean rating of 7.9 with a standard deviation of 1.6. A significance level of $\alpha = 0.05$ is selected. Should the attachment be introduced. (16)

Or

(b) A case involving proportions of two independent samples is illustrated in the table, which gives the number of users and non users of jeans in the country A and country B. Is the proportion of users the same in the country A and country B samples at a significance level of $\alpha = 0.05$? (16)

Users for the country A and country B

Sample	Useage of Jeans		
	Users	Non-users	Row totals
Country A	160	40	200
Country B	120	80	200
Column Totals	280	120	

14. (a) A purchase manager wanted to test if the variance of prices of un branded shirts was higher than the variance of prices of branded shirts. He needed strong evidence before he could conclude that the variance of prices of un branded shirts was higher than the variance of prices of branded shirts. He obtained price quotations from various shops and found that the sample variance of prices of un branded shirts from 13 shops was 27.5. Similarly, the sample variance of prices of a certain brand of shirts from 9 stores was 11.20. What can the purchase manager conclude at a significance level of 0.05? (16)

Or

(b) In an effort to decrease transportation costs, Central Taxi provided instruction in driving for economy for each of its twenty-four cab drivers. Test the results using a 0.05 level of significance and the sign test. (16)

Miles/gallon			Miles/gallon		
Driver	Before	After	Driver	Before	After
1	15.2	15.2	13	15.4	15.8
2	14.3	14.7	14	15.8	15.8
3	13.8	15.0	15	13.2	13.1
4	17.1	17.0	16	13.1	14.4
5	16.4	16.9	17	15.0	16.5
6	15.1	15.7	18	16.4	16.5

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Miles/gallon			Miles/gallon		
Driver	Before	After	Driver	Before	After
7	15.1	16.2	19	13.9	14.0
8	16.2	16.4	20	14.8	15.5
9	16.7	16.4	21	14.4	16.2
10	14.2	15.0	22	15.5	16.1
11	17.2	17.4	23	14.5	14.2
12	16.8	16.0	24	16.0	16.2

15. (a) (i) A researcher wants to explain attitudes towards a respondent's city of residence interms of duration of residence in the city. The attitude is measured on an 11 points scale. (1 = do not like the city, 11 = very much like the city), and the deviation of residence is measured interms of the number of years the respondent has lived in the city. In a pretest of 12 respondents, the data shown in the table are obtained. Find the correlation between attitude and duration. (10)

Respondent Number	Attitude towards the city	Duration of residence
1	6	10
2	9	12
3	8	12
4	3	4
5	10	12
6	4	6
7	5	8
8	2	2
9	11	18
10	9	9
11	10	17
12	2	2

(ii) How do you calculate R^2 value and if R^2 value is less, as a researcher what do you do? (6)

Or

(b) From the time series data below, using (i) last period demand (ii) arithmetic average (iii) two month moving average technique find the forecast for period 7 and choose the best technique using mean absolute deviation (MAD)? (16)

Month	1	2	3	4	5	6
Demand	20	30	40	30	50	58