

17/06/2014

Reg. No. :

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Question Paper Code : 60302

M.B.A. DEGREE EXAMINATION, MAY/JUNE 2014.

First Semester

BA 7102 — STATISTICS FOR MANAGEMENT

(Regulation 2013)

Time : Three hours

Maximum : 100 marks

Note : Scientific calculators and statistical tables are permitted.

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. The price of a selected stock over a five day period is shown as 170, 110, 130, 170, and 160. Compute the mean, median, and mode.
2. Thirty-two percent of the students in a management class are engineering graduate students. A random sample of 5 students is selected. Using the binomial probability function, determine the probability that the sample contains exactly 2 engineering graduate students?
3. A automobile repair shop has taken a random sample of 40 services that the average service time on an automobile is 130 minutes with a standard deviation of 26 minutes. Compute the standard error of the mean.
4. Explain how do you calculate 95% confidence interval for the average of the population?
5. You want to determine whether or not the mean of the population from which this sample was taken is significantly different from 48. State the null and the alternative hypotheses in mathematical notation.
6. Explain SS_{between} , SS_{within} and SS_y and their relationship in ANOVA.
7. Write the formula for chisquare test of single Standard deviation.

8. Two HR managers (A and B) ranked five candidates for a new position. Their rankings of the candidates are shown below :

Candidate	Rank by A	Rank by B
Nancy	2	1
Mary	1	3
John	3	4
Lynda	5	5
Steve	4	2

Compute the Spearman rank-correlation.

9. Briefly explain how a scatter diagram benefits the researcher?
10. What is irregular variation?

PART B — (5 × 16 = 80 marks)

11. (a) A sample of charge accounts at a local drug store revealed the following frequency distribution of unpaid balances. (4 × 4 = 16)

Unpaid Balance	Frequency
10-29	1
30-49	6
50-69	9
70-89	11
90-109	13

- (i) Determine the mean unpaid balance.
(ii) Determine the variance.
(iii) Determine the standard deviation.
(iv) Compute the coefficient of variation.

Or

- (b) (i) What are the possible outcomes in tossing three coins at a time? (6)
(ii) If A and B are independent event with $P(A) = \frac{2}{5}$ and $P(B) = \frac{3}{5}$, find $P(A \cup B)$. (5)
(iii) Let $S = \{1, 2, 3, 4, 5, 6\}$. if $A = \{2, 4, 6\}$ then find the probability of A complement. (5)
12. (a) A bank has kept records of the checking balances of its customers and determined that the average daily balance of its customers is Rs. 300 with a standard deviation of Rs. 48. A random sample of 144 checking accounts is selected. (4 × 4 = 16)
- (i) What is the probability that the sample mean will be more than Rs. 306.60?
(ii) What is the probability that the sample mean will be less than Rs. 308?

- (iii) What is the probability that the sample mean will be between Rs. 302 and Rs. 308?
- (iv) What is the probability that the sample mean will be at least Rs. 296?

Or

- (b) (i) A quality controller employed by a consumer testing organization reports that at 95% confidence he has determined that the true average content of the Uncola soft drinks is between 11.7 to 12.3 ounces. He further reports that his sample revealed an average content of 12 ounces, but he forgot to report the size of the sample he had selected. Assuming the standard deviation of the population is 1.28, determine the size of the sample. (8)
 - (ii) A simple random sample of 144 items resulted in a sample mean of 1257.85 and a standard deviation of 480. Develop a 95% confidence interval for the population mean. (8)
13. (a) (i) Explain the procedure for testing the two sample mean comparison for large and small sample case parametric tests. (8)
- (ii) In a low cost Toy production system, the molding machine has been set with standard of 1% defective. The 80 sample units produced from this machine shows the defective of one unit. Is it necessary to stop the product for corrective mechanism? Test at 5% level of significance (8)

Or

- (b) Part of an ANOVA table involving 8 groups for a study is shown below :

Source of variation	Sum of squares	Degrees of freedom	Mean square	F
Between				
Treatments	126	—?	—?	—?
Within	240	—?	—?	
Treatments (Error)				
Total	—?	67		

- (i) Complete all the missing values in the above table and fill in the blanks. (6 × 2 = 12)
 - (ii) Use alpha = 0.05 to determine if there is any significant difference among the means of the eight groups. (4)
14. (a) A clothing manufacturer purchased some newly designed sewing machines in the hopes that production would be increased. The production records of a random sample of workers are shown below.

Worker	Old Machine	New Machine
1	28	36
2	36	40

3	27	25
4	25	32
5	38	30
6	36	32
7	40	40
8	29	28
9	32	35
10	28	33
11	20	26
12	32	31
13	32	23
14	32	34
15	36	36

Use the Wilcoxon signed-rank test to determine whether the new machines have significantly increased production. Use a .05 level of significance. (16)

Or

(b) (i) The president of a company wants to see if the new anti-smoking campaign is having any influence on his employees. A sample of 100 employees who smoked prior to the campaign is taken. Thirty-six employees said they smoked less, 15 employees said they smoked more, and 49 employees said there was no change. Use chi-square test of homogeneity.

(1) State the null and alternative hypotheses. (2 × 2 = 4)

(2) Test the null hypothesis at the 1% level of significance. (4)

(ii) Explain Mann-Whitney U test with an example. (8)

15. (a) (i) What are the assumption made by the regression model in estimating the parameters and in significance testing? (8)

(ii) In what ways can regression analysis be used? (8)

Or

(b) Find Line of Best fit for the following time series data.

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Active investors ratio in the XYZ Co. (%)	2	5	5	10	12	16	17	14	20	23

Forecast for the years 2014 and 2015. (16)