M.B.A. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2010
First Semester
BA 9201 — STATISTICS FOR MANAGEMENT
(Regulation 2009)

Time : Three hours   Maximum : 100 Marks

(Statistical Table Book needs to be provided)
Answer ALL questions
PART A — (10 × 2 = 20 Marks)

1. Define probability.
2. Give example for continuous and discrete variables.
3. What is point estimate?
4. Give the meaning of random sampling.
5. Explain Type I and Type II error.
6. What do you mean by one-tail test?
7. Write the meaning of non-parametric test.
8. How do you find the degrees of freedom in case of chi-square test?
9. Specify the range of correlation.
10. What do you mean by seasonal variation?

PART B — (5 × 16 = 80 Marks)

11. (a) (i) The probability of appoint of one of the 4 persons namely A, B, C
and D in a Company are 1/5, 1/4, 2/7 and 3/4 respectively. The
probability that the company earns profit above Rs. 20,000 per
month due to their appointment is 1/3, 2/3, 1/5 and 2/5 respectively.
What is the probability that the company earns about
Rs. 20,000 per month? (8)
(ii) In a bolt factory machines A, B, C manufacture respectively 25%,
35% and 40% of the total of their output 5, 4, 2 percent are defective
bolts. If A bolt is drawn at random from the product and is found to
be defective, what are the probabilities that it was manufactured by
machine A, B and C? (8)
Or

(b) Fit a Poisson distribution to the following data and calculate the theoretical frequencies.

x : 0 1 2 3 4

f : 123 59 14 3 1

12. (a) The age of employees in a company follows normal distribution with its

mean and variance as 40 years and 121 years respectively. If a random sample of 36 employees is taken from a finite normal population of size 1000, what is the probability that the sample mean is

(i) less than 45

(ii) greater than 42 and

(iii) between 40 and 42?

Or

(b) A non-normal distribution representing the number of trips performed by

Lorries per week in a coal field has a mean of 100 trips and variance of 121 trips. A random sample of 36 Lorries is taken from the non-normal population. What is the probability that the sample mean is (i) greater than 105 trips, (ii) less than 102 trips and (iii) between 101 and

103 trips?

13. (a) The average number of defective articles in a certain factory is claimed to

be less than the average for all the factories. The average for all the factories is 30.5. A random sample of 100 defective articles showed the following distribution.

Class limits : 16-20 21-25 26-30 31-35 36-40

Number : 12 22 20 30 16

Calculate the mean and the standard deviation of the sample and use it to test the claim that the average is less than the figure for all the factories at 5% level of significance. Given 95 . 0) 645 . 1 (= − Z .

Or

(b) Three samples below have been obtained from normal populations with

equal variance. Test the hypothesis that the sample means are equal.

8 7 12
10 5 9
7 10 13
14 9 12
11 9 14

14. (a) Two researchers adopted different sampling techniques while investigating the same group of students to find the number of students falling in different intelligence levels. The results as follows :

No. of students

Researcher	Below average	Average	Above average	Genius
X	80	60	44	10
Y	40	33	25	12

Would you say that the sampling techniques adopted by the two researchers are significantly different?

Or

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(b) The production volume of units assembled by three different operators

during 9 shifts is summarized in Table 9.26. Check whether there is significant difference between the production volumes of units assembled by the three operators using Kruskal-Wallis test at a significant level of 0.05.

Operator I : 29 34 34 20 32 45 42 24 35
Operator II : 30 21 23 25 44 37 34 19 38
Operator III : 26 36 41 48 27 39 28 46 15

15. (a) Obtain the two regression lines :

x : 45 48 50 55 65 70 75 72 80 85
y : 25 30 35 30 40 50 45 55 60 65

Or

(b) Calculate seasonal index from the following data :

Year (Sales in 100 tonnes)

I quarter II quarter III quarter IV quarter
2005 30 22 15 45
2006 32 24 18 40
2007 35 29 20 37
2008 45 32 14 30
2009 50 30 12 35