90207 **M-5111**

Sl. No. Total No. of Pages : 3

I Semester MBA Examination, Jan./Feb. - 2018
(Scheme : 2011)
BUSINESS ADMINISTRATION
Statistics for Management

Time : 3 Hours **Max. Marks : 75**

SECTION - A

Answer all the questions. Each question carries six marks. **[5 × 6 = 30]**

1) What are the differences between a priori classical probability, empirical classical probability and subjective probability?

2) Explain Expected value of a discrete random variable with an example.

3) The arithmetic mean and standard deviation of 20 items were calculated by a student as 20cms and 5cms respectively. But while calculating them an item 13 was misread as 30. Find the correct arithmetic mean and standard deviation.

4) a) Define internal estimation.

   b) If $\bar{x} = 50$, $s = 15$, $n = 16$ and assuming that the population is normally distributed, set up a 99% confidence interval estimate of the population mean μ.

5) Calculate Karl Pearson's coefficient of correlation between sales and the test score of a salesman in training.

Sales (in Rs 000)	31	36	48	37	50	45	33	41	39
Score	14	19	24	21	26	22	15	20	19

P.T.O.

SECTION - B

Answer any three questions. Each question carries 10 marks. [3 × 10 = 30]

6) The fill amount of bottles of soft drink has been found to be normally distributed with a mean of 2.0 liters and a standard deviation of 0.05 liter. bottles that contain less than 95% of the listed net content (1.90 liters in this case) can make the manufactures subject to penalty by the state office of consumer affairs, whereas bottles that have a net content above 2.10 liters may cause excess spillage upon opening. What proportion of the bottles will contain.

a) between 1.90 and 2.0 liters?

b) between 1.90 and 2.10 liters?

c) below 1.90 liters?

d) above 2.10 liters

e) between 2.05 and 2.10 liters?

7) A steel company manufacturing steel bars, turns out there steel bars with mean length of at least 2.8 feet with a standard deviation of 0.20 foot. Longer steel bars can be used or altered, but shorter bars must be scrapped. A sample of 35 bars is selected from the production line. The sample indicates a mean length of 2.73 feet. The company wants to determine whether the production equipment needs to be adjusted.

a) State the null and alternative hypotheses.

b) If the company wants to test the hypothesis at the 0.05 level of significance, what decision would be more using the critical value approach to hypothesis testing?

8) On the bases of information given below about the treatment of 200 patients suffering from a disease, state whether the new treatment is comparatively superior to the conventional treatment. χ test at 5% level of significance.

	No of patients		
	Favourable	Not favourable	Total
New	60	30	90
Conventional	40	70	110
Total	100	100	200

9) The advertising expenses and sales figures are given below. Obtain the two regression equations.

Advt. expenses (in lakhs)	60	62	65	70	73	75	71
Sales (in crores)	10	11	13	15	16	19	24

Estimate a) the sales for advertising expenditure of Rs 90 lakhs and
b) the advertising expenditure for a sales target of Rs 25 crores.

10) Olive construction company is determining whether it should submit a bid for a new shopping center. In the past, olive's main competitor, Base construction company, has submitted bids 70% of the time. If Base construction company does not bid on a job, the probability that Olive construction company will get the job is 0.50. If base construction company does bid on a job, the probability that olive construction company will get the job is 0.25

a) If Olive construction company gets the job, what is the probability that Base construction company did not bid?
b) What is the probability that Olive construction company will get the job?

SECTION - C

Compulsory **[15]**

11) The following data represent the number of units of production per day turned out by 4 workers using 4 different types of machines. Test whether there is a significant difference

a) between the units produced by the workers
b) between the output given by different machines.

	Machine Type				Total
Workers	A	B	C	D	Workers
1	6	7	9	7	29
2	5	6	8	5	24
3	5	8	5	5	23
4	5	7	6	6	24
Total machines	21	28	28	23	100