

MBA in BI Sem.-1 Examination

BI-105

ASDM

Time : 2-30 Hours]

January-2025

[Max. Marks : 70

- Instructions :** (1) This paper contains **FIVE** questions.
 (2) All questions are compulsory.
 (3) Question No. **2, 3, 4** have internal options.
 (4) Figures in the right side in parenthesis indicate marks.

- Q:1** Find out the mean, median, mode and standard deviation and Quartiles from the data (14)
 given below:

Class	Frequency
0-10	5
10-20	6
20-30	12
30-40	3
40-50	1

- Q:2** Write a short note on probability and non-probability sampling techniques and explain (14)
 the primary scales of measurement in detail.

OR

- Q:2** A. For a binomial distribution with $n = 7$ and $p = 0.2$, find (07)
 i. $P(x = 5)$
 ii. $P(x > 2)$
 iii. $P(x < 8)$

- B. Given $\lambda = 4.2$, for a Poisson distribution, ($e^{-4.2} = 0.01500$) find (07)
 i. $P(x \leq 2)$
 ii. $P(x \geq 5)$
 iii. $P(x = 8)$

- Q:3** Hinton Press hypothesizes that the average life of its largest web press is 14,500 hours. (14)
 They know that the standard deviation of press life is 2,100 hours. From a sample of 25

presses, the company finds a sample mean of 13,000 hours. At a 0.01 significance level, should the company conclude that the average life of the presses is less than the hypothesized 14,500 hours? ($Z = \pm 2.33$)

OR

- Q:3** American Theatres knows that a certain hit movie ran an average of 84 days in each city, and the corresponding standard deviation was 10 days. The manager of the south-eastern district was interested in comparing the movie's popularity in his region with that in all of American's other theatres. He randomly chose 75 theatres in his region and found that they ran the movie an average of 81.5 days. (14)

(a) State appropriate hypotheses for testing whether there was a significant difference in the length of the picture's run between theatres in the south-eastern district and all of American's other theatres.

(b) At a 1 percent significance level, test this hypothesis ($Z = \pm 2.58$)

- Q:4** A research company has designed three different systems to clean up oil spills. The following table contains the results, measured by how much surface area (in square meters) is cleared in 1 hour. The data were found by testing each method in several trials. Are the three systems equally effective? Use the 0.05 level of significance (F Value = 3.89) (14)

System A	55	60	63	56	59	55
System B	57	53	64	49	62	
System C	66	52	61	57		

OR

- Q:4** A brand manager is concerned that her brand's share may be unevenly distributed throughout the country. In a survey in which the country was divided into four graphic regions, a random sampling of 100 consumers in each region was surveyed the results are as following: ($\chi^2 = 7.815$) (14)

	Region				Total
	NE	NW	SE	SW	
Purchase the brand	40	55	45	50	190
Do not purchase the brand	60	45	55	50	210
Total	100	100	100	100	400

- I. Calculate the sample X^2 value
- II. State the null and the alternative hypothesis
- III. At $\alpha = 0.05$, check whether the brand share is equal across the four regions

- Q:5** A corporation owns several companies. The strategic planner for the corporation believes dollars spent on advertising can to some extent be a predictor of total sales dollars. As an (14)

aid in long-term planning, she gathers the following sales and advertising information from several of the companies for 2009 (in millions).

Advertising	Sales
12.5	148
3.7	55
21.6	338
60	994
37.6	541
6.1	89
16.8	126
41.2	379

Develop the equation of the simple regression line to predict sales from advertising data. Find out the value of sales when advertising is 33 from the equation.
