Roll No. | | | | | | | | | | | | | **Total No. of Pages : 03**

Total No. of Questions : 15

MBA / MBA(IB) (2012 & onward) (Sem.–1)
QUANTITATIVE TECHNIQUES
Subject Code : MBA-104
Paper ID : [C0104]

Time : 3 Hrs. **Max. Marks : 60**

INSTRUCTION TO CANDIDATES :

1. **SECTION-A contains SIX questions carrying FIVE marks each and students has to attempt any FOUR questions.**
2. **SECTIONS-B consists of FOUR Subsections : Units-I, II, III & IV. Each Subsection contains TWO questions each carrying EIGHT marks each and student has to attempt any ONE question from each Subsection.**
3. **SECTION-C is COMPULSORY and consist of ONE Case Study carrying EIGHT marks.**

SECTION-A

1. "*Statistical methods are most dangerous tools in the hands of the inexpert*". Elucidate.

2. Differentiate between :

   a) Statistics and parameter

   b) Type I and Type II errors (2.5, 2.5)

3. Distinguish between Correlation and Regression. Why should there be two lines of regression in a bivariate distribution?

4. What are the components of a Time Series?

5. State and explain the addition and multiplication theorems on probability.

6. What are the uses of Chi-square test? Also explain various conditions for applying the chi-square test.

SECTION-B

UNIT-I

7. Calculate Coefficient of skewness by Karl Pearson's method and the values of $\sqrt{\beta_1}$ and β_2 from the following data :

Profits (₹ Lakh) :	10-20	20-30	30-40	40-50	50-60
No. of Companies :	18	20	30	22	10

OR

8. "Measure of central of tendency, dispersion, skewness and kurtosis are complimentary to one another in understanding a frequency distribution". Explain.

UNIT-II

9. 12 students were given intensive coaching and 5 tests were conducted in a month. The scores of tests 1 and 5 are given below. Does the scores from the 1 to 5 show an improvement?

No. of Students :	1	2	3	4	5	6	7	8	9	10	11	12
Marks in 1st test :	50	42	51	26	35	42	60	41	70	55	62	38
Marks in 5th test :	62	40	61	35	30	52	68	51	84	63	72	50

(Use 5% level of significance).

OR

10. Write short notes on the following :
    i) Standard error and sampling error.
    ii) Stratified random sampling
    iii) Multistage Sampling. (4,2,2)

UNIT-III

11. For certain X and Y series which are correlated, the two lines of regression are :

$$5X - 6Y + 90 = 0$$

$$15X - 8Y - 130 = 0$$

Find the mean of the two series and the correlation coefficient.

OR

12. Explain Time Reversal and Factor Reversal test in index numbers. What are the various problems while constructing on index numbers?

UNIT-IV

13. a) The odds against A speaking the truth are 4:6 while the odds in favour of B speaking the truth are 7:3.

i) What is the probability that A and B contradict each other in stating the same fact?

ii) If A and B agree on a statement, what is the probability that this statement is true?

b) A manufacturer who produces medicine bottles finds that 0.1% of the bottles are defective. The bottles are packed in boxes containing 500 bottles. A drug manufacturer buys 100 boxes from the producer of bottles. Using Poisson distribution, find how many boxes will contain:

i) no defectives.

ii) at least two defectives.

OR

14. Fit a straight line trend by the method of least squares to the following data. Assuming the same rate of change continues what would be the predicted sales for the year 2016?

Year:	2007	2008	2009	2010	2011	2012	2013	2014
Sales (₹ Lakh):	76	80	130	144	138	120	174	190

Calculate trend values from 2007 to 2014.

SECTION-C

CASE STUDY

15. Read the case carefully and answer the questions :

During the 2003 Super Bowl, Miller Lite's commercial referred to as "The Miller Lite" ranked among the top three most effective advertisements aired during the Super Bowl. The survey of advertising effectiveness, conducted by USA Today's Ad Track poll, reported separate samples by respondent age group to learn about how the Super Bowl advertisement appealed to different age groups. The following sample data apply to the "The Miller Lite" commercial.

Age Group	Sample Size	Liked the Ad a lot
Under 30	100	49
30 to 49	150	54

a. Formulate a hypothesis test that can be used to determine whether the population proportions for the two age groups differ.

b. Conduct the hypothesis test and report the *p*-value. At $\alpha = .05$, what is your conclusion?