M.B.A.

(SEM. I) EXAMINATION, 2008-09
BUSINESS STATISTICS

*Time : **3** Hours]*   *[Total Marks : **100***

Note :   *(1)*   *Attempt **all** questions.*

   (2)   *The **figures** in the **right** hand margin indicate marks.*

   (3)   *Table giving area under the normal curve will be supplied on demand.*

1   Answer any **four** of the following in about   **5×4=20**
       250 words each :

   (a)   What is Statistics ? What are the various uses of statistics in the management of an organisation?

   (b)   What are the properties of Arithmetic Mean?

   (c)   Explain the relationship between Binomial Distribution and Normal Distribution.

   (d)   Relationship between Z-test and t-test.

   (e)   Under what conditions do we make use of F-test?

   (f)   What is meant by level of significance?

(a) What is the distinction between median and mode? Under what conditions would you make use of each one of them in the analysis of business problems?

(b) Calculate mean deviation of number of heads in 20 tosses of five coins as given below :

Number of Heads (x)	Frequency (f)
0	1
1	2
2	7
3	6
4	3
5	1

OR

(a) The mean of 5 observations is 4 and the variance is 5.20. Three of these observations are given by 1, 2 and 6. What are the remaining two observations?

(b) A person takes a trip which consists of travelling 900 miles by train at an average speed of 30 m.p.h. , 3000 miles by plane at an average of 400 m.p.h., 400 miles by bus at 25 m.p.h. and finally 15 miles by taxi at 25 m.p.h. What is the average speed for the entire distance?

3 (a) State some of the decision problems in which one is required to do correlation analysis. What methods would you use in order to do correlations analysis under various conditions? Does the choice of method depend on the nature of data?

   (b) What is Geometric Mean? Under what conditions is it used?

OR

3 (a) Two dices are thrown. What is the probability that none of them shows a "Six" ?

   (b) An urn contains 4 white and 2 red balls. Two balls are drawn randomly with replacement. Find the probability that

      (i) both balls are white

      (ii) both balls will be of the same colour.

4 (a) The monthly mess bill of a student who is staying in the hostel follows a normal distribution with a mean of Rs.2000 and a standard deviation of Rs.185. What is the probabilities that in the next month his bill will go above Rs.2400?

   (b) In a normal distribution, 0.0107 of the items lie below 42 and 0.0446 of the items lie above 82. What is the mean and standard deviation of the normal distribution?

OR

4 (a) What is meant by type one and type two errors? Explain with the help of examples.

   (b) Under what conditions do we require to use one way Analysis of Variance? Give examples and explain the method involved by taking a hypothetical example.

5 Write notes on any **two** of the following :

   (a) Relationship between Binomial Distribution and Poisson Distribution.

   (b) Methods of Sampling.

   (c) Coefficient of Variation.

   (d) Components of Time Series.

You are given the following data :   10

Variable	X	Y
Mean	47	96
Variance	64	81

Coefficient of correlation between X and $Y = 0.36$. Determine the equations of regression lines. Calculate Y when $X = 50$ and X when $Y = 88$.

OR

Four persons in a group of 20 are graduates.   **10** If 4 persons are selected at random from 20, find the probability that

(1)   all are graduate

(2)   at least one is a graduate.

The average daily sales of 500 branch offices   **10** was Rs. 1,50,000 and the standard deviation Rs. 15,000. Assuming the distribution to be normal, indicate how many branches have sales between

(1)   Rs. 1,20,000 and Rs. 1,45,000

(2)   Rs. 1,40,000 and Rs. 1,65,000.

What is test of significance ? Discuss its role **10** in large sample theory.

Test the significance of the difference between **10** the means of the sample from the following data :

Sample	Size	Mean	SD
A	100	50	4
B	150	51	5

OR

4   (a)   What is 't' test ? Explain its applications.   **10**

    (b)   By using χ^2 (chi-square) test, find out whether   **10**
          there is any association between income level and
          type of schooling :

Income	Public School	Govt. School
Low	200	400
High	1000	400

(Given for degree of freedom 1, $\chi^2_{0.05} = 3.84$)

5   Write short notes on any **two** of the following :   **10+10**
    (a)   Measures of dispersion
    (b)   Multiplication theorem of probability
    (c)   Association of Attributes
    (d)   Index Number and its uses.

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID:7026 Roll No. [   ]

MBA

FIRST SEMESTER EXAMINATION, 2006-07

BUSINESS STATISTICS

Time : 3 Hours *Total Marks : 100*

Note : (i) *Attempt **ALL** questions.*

(ii) *All questions carry equal marks.*

(iii) *In case of numerical problems assume data wherever not provided.*

(iv) *Be precise in your answer.*

1. Attempt *any four* parts of the following : **(5x4=20)**

(a) Explain briefly what you understand by the science of statistics.

(b) What do you understand by dispersion ? What is the need of studying dispersion ?

(c) Define Probability. What is the probability of getting more then 10 in a single throw of 2 dice ?

(d) Distinguish between Binomial and Poisson distribution.

(e) Distinguish between Time Reversal and Factor Reversal tests.

(f) Distinguish between :

  (i) Type I error and Type II error

  (ii) Parameter and statistic

  (iii) Sample and population

(a) Distinguish between measure of central tendency and dispersion. Illustrate with the help of examples. **(10)**

(b) Find arithmetic mean and standard deviation from the following data. Also find coefficient of variation.

Age (less than) :	10	20	30	40	50	60	70	80
No. of persons :	15	30	50	75	100	110	115	125

(10)

OR

(a) What is a Time Series ? Explain the objectives of the analysis of a time series. **(10)**

(b) Fit a straight line trend to the following data. **(10)**

Year	Sales (in lakh tonnes)
1998	100
1999	120
2000	135
2001	170
2002	200
2003	250
2004	290

and estimate sales for 2005.

3. (a) Distinguish between Correlation and Regression. Why there are two regression lines ? **(10)**

(b) In the following table X is advertising cost (in thousand rupees) and Y is sales (in lakh rupees). **(10)**

X : 12   18   24   30   36   42   48

Y : 5.7   6.9   7.1   8.3   10.1   12.2   13.6

Find Karl Pearson Correlation Coefficient between X and Y.

OR

(a) State and prove addition theorem of probability. **(10)**

(b) As a result of tests on 20,000 electric bulbs manufactured by a company it was found that life time of the bulbs was normally distributed with an average life of 2040 hours and standard deviation of 60 hours. Estimate the number of bulbs that is expected to burn for : **(10)**

(i) more then 2150 hours and

(ii) less than 1960 hours.

4. (a) Describe the various steps involved in testing a statistical hypothesis. **(10)**

(b) An automatic machine was designed to pack 2.0 kg of Vanaspati. A sample of 100 tins was examined to test the machine. The average weight was found to be 1.94 kg with standard deviation 0.10 kg. Is the machine working properly ? **(10)**
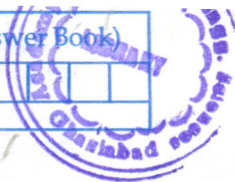
OR

(a) What is a Chi-square test ? Give an example. **(10)**

(b) What is analysis of variance ? Explain its testing procedure when data is classified according to two ways. **(10)**

5. Write short notes on *any two* of the following : **(20)**

(a) Association of Attributes

(b) Skewness

(c) Fisher Index Numbers

(d) Property of Normal Distribution

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MBA

FIRST SEMESTER EXAMINATION, 2005-2006

BUSINESS STATISTICS

Time : 3 Hours   *Total Marks : 100*

Note :   *(i)   Answer **ALL** questions.*

(ii)   The figures in the right hand margin indicate marks.

(iii)   Statistical table will be supplied on demand.

(iv)   Be precise in your answer.

1.   Answer *any four* of the following in about 250 words
      each :   **(5x4=20)**

   (a)   Statistics affects everybody and touches life at
         many points. It is both a science and an art."
         Comment.

   (b)   What do you mean by dispersion ? Enlist the
         important measures of dispersion.

   (c)   Describe the addition and multiplication rules of
         probability with an example for each.

   (d)   Define normal distribution and list its properties.

   (e)   Distinguish between Laspeyre's and Paasche's
         Index Number formulae.

   (f)   Steps in a test of significance problem.

'Measure of central tendency, dispersion and skewness are complementary to one another in understanding a frequency distribution'. Elucidate.

Find the coefficient of variation, if the sum of squares of the deviations of 10 observations taken from mean 50 is 250.

OR

(a) What is c time series ? Explain its methods for isolating trends. **(10)**

(b) The number of units of a product exported during 1997-2004 is given below. Fit straight line trend by the method of least square. Estimate the export for 2005. **(10)**

Year	No. of units (in '000)
1997	15
1998	20
1999	24
2000	29
2001	35
2002	45
2003	60
2004	85

(a) Discuss the meaning of correlation and distinguish between positive and negative correlation. **(10)**

(b) Regression equation of two valuables X and Y are as follow : **(10)**

$3X + 2Y = 26$ and $bX + Y = 31$

Find (i) The mean of X and Y series.

(ii) The coefficient of correlation and

(iii) The most probable value of Y when $X = 5$.

OR

(a) A problem in Business Statistics is given to four students A, B, C and D. Their respective chances of solving it are $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{5}$ and $\frac{1}{6}$. What is the probability that the problem will be solved by any two of them ? **(10)**

(b) 2000 Students appeared in an examination. Distribution of marks is assumed to be normal with mean $\mu = 30$ and $\sigma = 6.25$. How many students are expected to get marks **(10)**

   (i) Between 20 and 40

   (ii) Less then 35 and

   (iii) Above 50.

(a) Explain the following terms **(10)**

   (i) Null hypothesis

   (ii) 5% and 1% level of significance

   (iii) degrees of freedom

   (iv) 't' - test.

(b) A company produces two makes of bulks A and B. 200 bulks of each make were tested and it was found that make A has mean life of 2,560 hours and S.D. of 90 hours, whereas make B has 2,650 hours of mean life with S.D of 75 hours. Is there a significant difference between the mean life of the two makes ? **(10)**

<center>**OR**</center>

(a) Chi-square test is used for testing of goodness of fit, homogenity of data and Independence, Discuss. **(10)**

(b) Examine by any suitable method, whether the nature of area is related to voting preference in the election for which the data are tabulated below : (10)

Votes for Area	A	B	Total
Rural	620	480	1100
Urban	380	520	900
Total	1000	1000	2000

5. Write short notes on *any two* of the following : (10+10=20)

(a) Binomial distribution

(b) F - test

(c) Yules coefficient of Association

(d) Cost of living Index Number

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MBA

FIRST SEMESTER EXAMINATION, 2004-2005

BUSINESS STATISTICS

Time : 3 Hours   *Total Marks : 100*

Note :   *(i)*   *Attempt **ALL** questions.*

  (ii)   *The figures in the right hand margin indicate marks.*

1.   Answer *any four* of the following in about 250 words each :—   **(5x4=20)**

  (a)   "Statistics plays an important role not only in the study of Economics and Commerce, but also in managerial decision - making". Explain briefly.

  (b)   Discuss the merits and demerits of Mode as a measure of central tendency.

  (c)   In probability theory $P(A).P(B/A) = P(B).P(A/B)$.

  (d)   A binomial variable X satisfies the relation $9 P (X=4) = P(X=2)$ when $n=6$. Find the value of the parameter p and $P(X=1)$.

  (e)   Explain the meaning and importance of time series.

(f) Define null hypothesis, critical region and two - sided test used in testing of statistical hypothesis.

(a) What are the measures of dispersion ? Why is standard deviation considered to be the most reliable measure of dispersion ? **10**

(b) Calculate standard deviation from the following data : **10**

Age (in years)	4 - 6	6 - 8	8 - 10	10 - 12	12 - 14	14 - 16	16 - 18
No. of students	30	90	120	150	80	60	20

OR

(a) What is a time series ? Explain the various components of a time series. **10**

(b) The following table shows the number of salesman working for a certain concern : **10**

Year :	1998	1999	2000	2001	2002	2003
Number :	28	38	46	40	56	60

Use the method of least squares to fit a straight line trend.

(a) Define Karl Pearson's coefficient of correlation. How would you interpret the sign and magnitude of a correlation coefficient ? **10**

(b) Derive regression lines for the following data : **10**

$\Sigma x = 30$, $\Sigma x^2 = 190$, $\Sigma xy = 192$, $\Sigma y = 30$, $\Sigma y^2 = 190$, $n = 5$.

OR

(a) A can hit a target 3 times in 5 shots, B 2 times in 5 shots, and C 3 times in 4 shots. They fire a volley. What is the probability of hitting 2 shots ? **10**

(b) The mean yield per plot of a crop is 17 kg and standard deviation is 3 kg. If distribution of yield per plot is normal, find the percentage of plots giving yields : **10**

(i) Between 15.5 kg and 20 kg; and

(ii) More than 20 kg.

(a) What is the major purpose of hypothesis testing ? Explain the various steps involved in hypothesis testing. **10**

(b) Two types of batteries X and Y are tested for their length of life and the following results are obtained : **10**

Battery	Sample size	Mean (hr)	Std. Deviation (hr)
X	100	1000	10
Y	120	1020	11

Can you conclude that the two types of batteries are having the same mean life ?

OR

(a) Describe the usefulness of analysis of variance technique in business decisions. **10**

(b) The following information is obtained concerning an investigation of 50 ordinary shops of small size : **10**

Organisation Run by	Shops located in	
	Urban area	Rural area
Men	17	18
Women	3	12

Can it be inferred that shops run by women are relatively more in rural areas than in urban areas ? Use χ^2 - test.

Extract from χ^2 -Table.

Degrees of freedom	1	2	3	4	5
$\chi^2_{0.05}$	3.841	5.991	7.815	9.488	11.070

5. Write notes on *any two* of the following :   (10+1

(a) Measures of central tendency

(b) Addition and Multiplication Theorems of Probability

(c) Qualitative Statistics

(d) Index Numbers and its construction.

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