

Reg. No.

First Semester M.B.A Degree Examination, December 2005 / January 2006

Master of Business Administration
Statistics for Management

Time: 3 hrs.)

(Max.Marks : 100)

- Note:** 1. Answer any FIVE full questions.
2. Use of statistical tables permitted.

1. (a) What is statistics ? Discuss the role of statistics in business and management. **(7 Marks)**
- (b) A computer while calculating correlation coefficient between two variables X and Y from 25 pairs of observations obtained following results.

$$\begin{aligned} n &= 25 & \sum y &= 100 \\ \sum x &= 125 & \sum y^2 &= 460 \\ \sum x^2 &= 650 & \sum xy &= 508 \end{aligned}$$

It was, however, discovered that two pairs of observations were not correctly taken. They were taken as (6, 14) and (8, 6) while the correct values were (8, 12) and (6, 8) respectively. Find the corrected correlation coefficient. **(5 Marks)**

- (c) The median and mode of the following distribution are known to be Rs 33.5 and Rs. 34 respectively. Find the values of the missing frequencies in the data.

Wages in Rs.	No. of persons
0 - 10	4
10 - 20	16
20 - 30	2
30 - 40	2
40 - 50	2
50 - 60	6
60 - 70	4
	N = 230

(8 Marks)

2. (a) What is time series analysis ? Briefly discuss the components of time series with examples. **(7 Marks)**
- (b) Find the standard deviation from the following data.

X :	12	13	14	15	16	17	18	19
f :	1	0	4	12	20	15	6	2

(5 Marks)

(c) Goals scored by two teams A and B in a football season were as shown below.

	No. of goals in a match	0	1	2	3	4
No. of matches	Team A	27	9	8	5	4
	Team B	17	9	6	5	3

Which team is more consistent ?

(8 Marks)

3. (a) Explain type I and type II errors. Also mention the applications chi-square test.

(7 Marks)

(b) Find the geometric mean for the following distributions.

Marks	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50
No. of Students	5	7	15	25	8

(5 Marks)

(c) If two lines of regression are

$$4x - 5y + 30 = 0$$

$$20x - 9y - 107 = 0$$

Which of these lines is the line of regression of x and y and y on x . Also find correlation coefficient and standard deviation of y when standard deviation x is $3(\sigma_x = 3)$.

(8 Marks)

4. (a) Discuss the advantages of sample method over census method.

(7 Marks)

(b) 20 books are placed at a random in a shelf. Find the probability that a particular pair of books shall be

i) always together

ii) never together

(5 Marks)

(c) From the following data, calculate the rank correlation co-efficient.

x	48	33	40	9	16	16	65	24	16	57
y	13	13	24	6	15	4	20	9	6	19

(8 Marks)

5. (a) Discuss briefly the steps involved in testing of a statistical hypothesis in a systematic manner.

(7 Marks)

(b) Calculate Paasche's price index number from the following data.

	1970		1980	
Commodities	Price	Quality	Price	Quantity
A	20	8	40	6
B	50	10	60	5
C	40	15	50	15
D	20	20	20	25

(5 Marks)

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- (c) 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

(8 Marks)

6. (a) What is analysis of variance ? State the underlying assumptions. (7 Marks)

- (b) Find the 6th decile and 70th percentile from the following data

Marks	< 10	10 - 19	20 - 29	30 - 39	40 - 49	50 - 59	60 - 69	70 - 79
No. of Students	5	8	7	12	28	20	10	10

(5 Marks)

- (c) The data given below are the figures of production (in 1000 tones) of a sugar factory.

Year	1989	90	91	92	93	94	95
Production	77	88	94	85	91	98	90

- i) Fit a straight line by the method of least squares and show the trend values.
 ii) What is the monthly increase in production ? (8 Marks)

7. (a) What do you mean by primary data and secondary data ? Mention the methods of collecting primary data. Also bringout the considerations for the choice between primary and secondary data. (7 Marks)

- (b) The data gives below give the yearly profits of two companies A and B (in 000 Rs.)

Year	Company A	Company B
1994 - 95	120	90
1995 - 96	135	95
1996 - 97	140	108
1997 - 98	160	120
1998 - 99	175	130

Represent the data by means of a suitable diagram. (5 Marks)

- (c) Calculate the appropriate measure of dispersion from the following data :

Wages	No. of earners
< 35	14
35 - 37	60
38 - 40	95
41 - 43	24
> 43	7

(8 Marks)

8. (a) Discuss the advantages and disadvantages (or limitations) of simple random sampling. (7 Marks)

(b) In a survey of 200 boys of which 75 were intelligent, 40 had educated fathers, while 85 of the unintelligent had uneducated fathers. Do these figures support the hypothesis that educated fathers have intelligent boys? (Value of X^2 for 1 degree of freedom is 3.84). (5 Marks)

(c) Assume the mean height of soldiers to be 68.22'' with a variance of 10.8 *inch*². How many soldiers in a regiment of 1000 would you expect to be

i) Over 6' tall

ii) Below 5.5'

Also assume that the heights are normally distributed.

(8 Marks)

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NEW SCHEME

**First Semester MBA Degree Examination, July 2006
 Master of Business Administration
 Statistics for Management**

Time: 3 hrs.]

[Max. Marks: 100

**Note: 1. Answer any FIVE full questions.
 2. The use of statistical tables is permitted.**

1.
 - a. Discuss the role of statistics in Business and Economics. (07 Marks)
 - b. Mean and standard deviation of 8 observations were found to be 4.7 and 0.8 respectively. Afterwards it was found that one of the observations was wrongly entered as 3.6 instead of 6.3. With this correction find the actual mean and standard deviation. (05 Marks)
 - c. As a result of tests on 20,000 electric bulbs manufactured by a company it was found that the lifetime of the bulb was normally distributed with an average life of 2,040 hrs and standard deviation of 60 hrs. On the basis of the information estimate the number of bulbs that are expected to burn.
 - i) for more than 2,150 hrs
 - ii) less than 1,960 hrs. (08 Marks)

2.
 - a.
 - i) Distinguish between absolute and relative measures of variation
 - ii) Mention the properties of standard deviation. (07 Marks)
 - b. 2 percent of the fuses manufactured by a firm are expected to be defective. Find the probability that a box containing 200 fuses contains
 - i) defective fuses
 - ii) 3 or more defective fuses. (05 Marks)
 - c. Prepare a frequency distribution for the following observations taking class intervals as 15-25, 25-35, 35-45,.....and so on. Hence draw the Histogram. (08 Marks)

15	45	40	42	50	60	62	68	70	42
75	75	80	81	25	26	31	32	78	45
31	45	42	43	55	56	78	80	81	62
60	62	58	69	70	45	50	56	72	58
75	62	62	65	60	70	35	37	40	55

3.
 - a. Define (i) Binomial distribution (ii) Poisson distribution with one example each. Also write down any three properties of Normal distribution. (07 Marks)
 - b. Annual budget allocation for various projects is as follows. Represent the data using a pie diagram. (05 Marks)

Plants	Annual allocation (in lakhs)
Project A	300
Project B	250
Project C	160
Project D	400
Project E	590

c. Following is the distribution of daily wages of workers of two factories.

Wages (in Rs)	50-60	60-70	70-80	80-90	90-100
No. of workers Factory A	2	7	10	6	5
No. of workers Factory B	3	8	13	4	2

- i) In which factory is total daily wages more?
 ii) In which factory is daily wages variation more? (08 Marks)

- 4 a. i) Explain the desired qualities of an ideal measure of central tendency.
 ii) Mention any two properties of arithmetic mean. (07 Marks)
 b. From the following table obtain the coefficient of rank correlation (05 Marks)

X	43	96	74	38	35	43	22	56	35	80
Y	30	94	84	13	30	18	30	41	48	95

- c. The median and mode of the following wage distribution are known to be Rs. 33.5 and 34. If the total number of workers is 230, find the missing frequencies. (08 Marks)

Wages (in Rs)	0-10	10-20	20-30	30-40	40-50	50-60	60-70
No. of workers	4	16	-	-	-	6	4

- 5 a. Explain the probability sampling and non probability sampling with suitable examples (07 Marks)
 b. Price of T.V sets increased by 10% and 2% in two successive years. In the next year it decreased by 22%. Find the average rate of increase / decrease. (05 Marks)
 c. For 100 students of a MBA class, regression equation of works in statistics (x) on the marks in Economics (y) is $3y - 5x + 180 = 0$. The mean marks in economics is 50 and variance of marks in statistics is $(4/9)^{\text{th}}$ of the variance of marks in economics. Find the mean marks in statistics and the coefficient of correlation between marks in the two subjects. (08 Marks)
- 6 a. Define sampling distribution and standard error. Write down any four advantages of sampling. (07 Marks)
 b. The following table gives age of cars of a certain make and actual maintenance cost. Obtain the regression equation for costs related to age. (05 Marks)

Age	2	4	6	8
Cost	10	20	25	30

- c. Compute 3rd quartile, 7th decile and 63rd percentile from the following frequency distribution. (08 Marks)

Class intervals	0-9	10-19	20-29	30-39	40-49	50-59
Frequency	12	27	34	41	23	3

- 7 a. Define time series. Explain its objectives and components. (07 Marks)
 b. The manufacture of a certain make of electric bulbs claims that his bulbs have a mean life of 25 months with a standard deviation of 5 months. A random sample of six such bulbs gave the following values
 Life (in months) : 24, 26, 30, 20, 18
 Can you regard the producer's claim about the mean life to be valid at 1% level of significance? (05 Marks)
 c. Fit a quadratic trend for the following time series. Hence estimate the population for the year 2011. (08 Marks)

Year	1961	1971	1981	1991	2001
Population (in crores)	44	55	68	84	101

- c. A Company produces tyres, tyre life is normally distributed. The mean life is 40,000 km and s.d. is 3000 km. A new process is introduced to produce better tyres. A sample of 100 tyres is taken with mean life 40,900 km. Is new tyre significantly better than old tyre? Test at 1% significance level. (07 Marks)
- 8 a. Explain primary data and secondary data. (08 Marks)
b. Find s.d and CV from following (05 Marks)

X	F
90-99	2
80-89	12
70-79	22
60-69	20
50-59	14
40-49	4
30-39	1

- c. In a normal distribution 31% of the men are below 45 kg and 8% of men are above 64kg, find the mean and s.d of the distribution. (07 Marks)

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NEW SCHEME

First Semester MBA Degree Examination, July 2007
Business Administration
Statistics for Management

Time: 3 hrs.]

[Max. Marks:100

Note : 1. Answer any FIVE full questions.
 2. The use of statistical tables is permitted.

- 1 a. Define statistics. Explain where statistics can be applied in management (07 Marks)
 b. Find the average rate of increase in population which in the first decade had increased by 20%, in the next by 30% and in the third by 40%. (05 Marks)
 c. For a certain frequency table which has only been partly reproduced here, the mean was found to be 1.46.

No. of accidents	0	1	2	3	4	5	Total
Frequency (no. of days)	46	?	?	25	10	5	200

Calculate the missing frequencies.

(08 Marks)

- 2 a. What is the difference between primary data and secondary data? What are the different sources of secondary data? Explain. (07 Marks)
 b. The following table shows the area in millions of sq. km. of oceans of the world.

Ocean	Area (Millions sq.km.)
Pacific	70.8
Atlantic	41.2
Indian	28.5
Antarctic	7.6
Artic	4.8

Draw a pie diagram to represent the data.

(05 Marks)

- c. The following data gives the distribution of marks of 100 students. Calculate the most suitable average giving the reason for your choice. Also obtain the values of quartiles, 6th decile and 70th percentile from the following data:

Marks	No. of students	Marks	No. of students
Less than 10	5	Less than 50	60
Less than 20	13	Less than 60	80
Less than 30	20	Less than 70	90
Less than 40	32	Less than 80	100

(08 Marks)

- 3 a. What are the different 'measures of dispersion'? Explain any two of them in detail including properties and formulae. (07 Marks)

Contd.... 2

- b. The following table gives the frequency distribution of the weekly wages (in '00 Rs.) of '00 workers in a factory:

Weekly wages ('00 Rs.)	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64
No. of workers	4	5	12	23	31	10	8	5	2

Draw the histogram and frequency polygon of the distribution. (05 Marks)

- c. Calculate Karl Pearson's coefficient of correlation between expenditure on advertising and sales from the data given below:

Advertising expenses ('000 Rs.)	39	65	62	90	82	75	25	98	36	78
Sales (lakh Rs.)	47	53	58	86	62	68	60	91	51	84

(08 Marks)

- 4 a. Define 'correlation' and 'regression'. What do you mean by i) Positive correlation ii) Negative correlation iii) Linear correlation iv) Non linear correlation v) No correlation? (07 Marks)
- b. Find the mean and standard deviations of the following observations:
X: 1, 2, 4, 6, 8, 9 (05 Marks)
- c. The data about the sales and advertisement expenditure of a firm is given in the table.
- Estimate the likely sales for a proposed advertisement expenditure of Rs.10 crores.
 - What should be the advertisement expenditure if the firm proposes a sales target of 60 crores of rupees?

	Sales (in crores of Rs.)	Advertisement expenses (in crores of Rs.)
Means	40	6
Standard deviation	10	1.5

Coefficient of correlation = $r = 0.9$.

(08 Marks)

- 5 a. Explain the following terms with suitable examples:
i) Random experiment ii) Trial and event iii) Mutually exclusive events iv) Equal likely case v) Independent events vi) Empirical probability vii) Axiomatic probability. (07 Marks)
- b. A random sample of 400 items is found to have a mean of 82 and standard deviation of 18. Find 95% confidence limits for the mean of the population from which the sample is drawn. (05 Marks)
- c. Calculate the quarterly trend values by the method of least square for the quarterly data for the last five years given below:

Year	I Quarter	II Quarter	III Quarter	IV Quarter
1994	60	80	72	68
1995	68	104	100	88
1996	80	166	108	96
1997	108	152	136	124
1998	160	184	172	164

(08 Marks)

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2.36

- 6 a. From the prices X and Y of shares A and B respectively given below, state which is more stable in value:

Price of share A	55	54	52	56	58	52	50	51	49
Price of share B	108	107	105	106	107	104	103	104	101

(07 Marks)

- b. Explain in detail about Type I, Type II error. (05 Marks)
- c. What are the advantages of index numbers? Write the notations and formulae for the following:
- i) Paasche's price index – Passche's quantity index
 - ii) Fisher's price index – Fisher's quantity index
 - iii) Laspeyre's price index – Laspeyre's quantity index.

How do they differ? (08 Marks)

- 7 a. Explain the different types of sampling methods in detail? (07 Marks)
- b. A random sample of 20 daily workers of State A was found to have average daily earning of Rs.44 with sample variance 900. Another sample of 20 daily workers in State B was found to earn an average of Rs.30 per day with sample variance 400. Test whether the workers in State A are earning more than those in State B. (05 Marks)
- c. An Urn contains 8 white and 3 red balls. If two balls are drawn at random, find the probability that:
- i) both are white
 - ii) both are red
 - iii) one is of each colour. (08 Marks)

- 8 a. A trucking company wishes to test the average life of each of the four brands of tyres. The company uses all brands on randomly selected trucks. The records showing the lives (thousands of miles) of tyres are given in table. Test the hypothesis that the average life for each brand of tyres is the same. Assume $\alpha = 0.01$ and $F = 5.56$.

Brand 1	Brand 2	Brand 3	Brand 4
20	19	21	15
23	15	19	17
18	17	20	16
17	20	17	18
	16	16	

(07 Marks)

- b. Explain the properties of binomial and Poisson distribution. (05 Marks)
- c. A movie producer is bringing out a new movie. In order to map out his advertising, he wants to determine whether the movie will appeal most to a particular age group or whether it will appeal equally to all age groups. The procedure takes a random sample from persons attending a pre-review showing of the new movie and obtain the following results:

Use Chi-Square test to derive the conclusion.

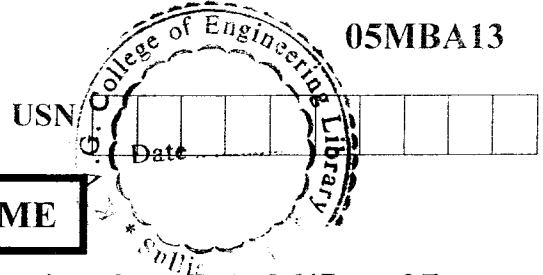
Persons	Age group				Total
	Under -20	20-39	40-59	60 and over	
Liked the movie	320	80	110	200	710
Disliked the movie	50	15	70	60	195
Indifferent	30	5	20	40	95
Total	400	100	200	300	1000

(08 Marks)

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NEW SCHEME

First Semester MBA Degree Examination, Dec.06/Jan. 07
Business Administration
Statistics For Management

Time: 3 hrs.]

[Max. Marks:100

Note: 1. Answer any FIVE full questions.
2. Use of statistical tables permitted.

- 1 a. What is distrust of statistics? Explain role of statistics in Economics. (08 Marks)
b. For the following frequency distribution of 100 families the median is 50. Find the unknown frequencies f_1 and f_2 for classes 20-40 and 60-80. (05 Marks)

Expenditure (Rs)	No. of Families.
0-20	14
20-40	f_1
40-60	27
60-80	f_2
80-100	15
	N = 100

- c. If two regression equations are given
 $3x + 2y = 26$ (07 Marks)
 $6x + y = 31$ find mean values of x and y. Also find coefficient of correlation.
- 2 a. What is correlation? Distinguish between positive and negative correlation with suitable diagrams. (08 Marks)
b. Represent the following data by pie diagrams. (05 Marks)

Particulars	Expenditure (Rs)	
	Family A	Family B
Food	30	22.5
Cloth	60	67.5
Rent	45	30
Miscellaneous	45	60

- c. Calculate the coefficient of correlation. Take 31 and 25 as assumed means for x and y series respectively for calculation purpose. (07 Marks)
- X : 23, 27, 28, 29, 30, 31, 33, 35, 36, 39
Y : 18, 22, 23, 24, 25, 26, 28, 29, 30, 32
- 3 a. Explain mutually exclusive events and independent events with suitable examples. (07 Marks)
b. Fit a straight line by the method of least squares. Estimate the sales for 2001. (05 Marks)

Year	1995	1996	1997	1998	1999	2000
Sales (Rs)	15	14	18	20	17	24

Contd... 2

- c. The table shows the data obtained during outbreak of Dengue.

	Attacked	Not attacked	Total
Vaccinated	31	469	500
Not vaccinated	185	1315	1500
Total	216	1784	2000

Test the effectiveness of vaccination in preventing the attack from Dengue. Test the result at 5% significance level using chi-square. (value of χ^2 is 3.841) (08 Marks)

- 4 a. What is importance of time series analysis? Explain its components. (08 Marks)
 b. The letters of the word "ARTICLE" are arranged randomly. Find probability of vowels occupying the even places. (05 Marks)
 c. Calculate price index for 1996 with 1986 as base using Laspeyzer's index, Paasche index and Fischer index. (07 Marks)

Item	1986		1996	
	Price (Rs)	Quantity	Price (Rs)	Quantity
A	10	150	11	160
B	12	90	13	100
C	15	60	16	60
D	9	50	12	40

- 5 a. Explain type I and type II error. Also mention different types of hypothesis testing. (08 Marks)
 b. Calculate the geometric mean from the data. (05 Marks)

Marks	40-60	60-80	80-100	100-120	120-140
No. of students	14	54	26	4	2

- c. From the following data calculate the rank correlation coefficient. (07 Marks)

X:	48	33	40	9	16	16	65	24	16	57
Y:	13	13	24	6	15	4	20	9	6	19

- 6 a. Explain random sample with examples. (08 Marks)
 b. The A.M. and standard deviation of set of 20 items were computed as 20 cm and 5 cm respectively. While computing an item 13 cm was wrongly misread as 30. Find the correct A.M. and S.d. (05 Marks)
 c. The no. of accidents in a year in a city follows Poisson distribution with mean of 5 out of 1000 taxi drivers. Find the approximate number of taxi drivers with
 i) no accidents in a year ii) five accidents in a year. (07 Marks)
- 7 a. What is ANOVA? State assumptions. (08 Marks)
 b. Find 45th and 57th percentile for the marks obtained by 100 students. (05 Marks)

Marks	20-25	25-30	30-35	35-40	40-45	45-50
No. of students	10	20	20	15	15	20

- 8 a. i) Define the terms critical region, type I error, type II error, level of significance, power of a test. (07 Marks)
 ii) Mention the assumption in analysis of variance. (05 Marks)
 b. Compute Fisher's index number from the following data (05 Marks)

Item	Base year		Current year	
	Price	Total value	Price	Total value
A	50	100	60	180
B	40	200	40	200
C	100	100	120	120
D	20	80	25	100

- c. The following table gives the number of units of production per day turned out by four different types of machines

		Machines			
		M1	M2	M3	M4
Employees	E1	40	36	45	30
	E2	38	42	50	41
	E3	36	30	48	35
	E4	46	47	52	44

Using analysis of variance

- i) test the hypothesis that the mean production is the same for the four machines
 ii) test the hypothesis that the employees do not differ with respect to mean productivity. (08 Marks)

NEW SCHEME

First Semester MBA Degree Examination, July 2007
Business Administration
Accounting for Managers

Time: 3 hrs.]

[Max. Marks:100

Note : Answer any FIVE full questions.

- 1 a. What is meant by GAAP? (03 Marks)
 b. Distinguish journal from ledger. (07 Marks)
 c. Journalize the following transactions in the books of Vaibhav and Co.
 November 2006
1. Started business with Rs.200000 – out of which Rs.50000 – deposited into bank.
 2. Purchased goods from Trilok and Sons worth Rs.40000.
 4. Sold goods for cash Rs.20000.
 8. Paid to Trilok and Sons and availed cash discount of Rs.400.
 10. Paid telephone bill through bank Rs.500.
 12. Purchased furniture worth Rs.25000 for exchange of goods.
 15. Purchased a computer for personal use for Rs.20000 paid through bank.
 18. Purchased goods from Saurabh and Company on invoice price of Rs.12000 at a trade discount of 10%.
 20. Paid office expenses Rs.200.
 22. Issued cheque to Sourabh and Company to settle his account. (10 Marks)
- 2 a. What are the objectives of charging depreciation? (03 Marks)
 b. "Trial balance may agree but it is not a proof of accuracy of books of accounts". (07 Marks)
 Comment.
 c. Following transactions relates to Tribhuvan Traders, enter them in suitable cash book. August 2006
1. Cash-in-hand Rs.25000 and amount utilized from bank cash credit account Rs.5000 (cash credit limit is Rs.50000)
 2. Purchased goods for cash Rs.5000.
 4. Sold goods on account to Vikas Rs.8000.
 6. Purchased office furniture and issued a cheque Rs.5000.
 7. Drawn from bank for office use Rs.2000 and for personal use Rs.1000.
 9. Purchased goods for cash Rs.15000.
 12. Purchased motor cycle on account from Sai Krupa motors for Rs.30000.
 13. Received from Vikas a cheque to settle his account and discount allowed to him Rs.100.
 15. Paid wages Rs.500.
 18. Sold goods for cash Rs.10000.
 20. Issued cheque to Sai Krupa motors and discount allowed by them Rs.200.
 22. Deposited into bank Rs.1000.
 24. Dividend received by bank Rs.500. (10 Marks)
- 3 a. What is accounting equation? (03 Marks)
 b. Briefly explain the following:
 AS – 6 Depreciation accounting. (07 Marks)
 AS – 2 Valuation of inventories.

Contd....2

- 3 c. PQ Limited purchased a plant and machinery on 1st April 2000 for Rs.450000 and incurred installation charges of Rs.50000. On 30th September 2000 it purchased second machinery for Rs.100000. On 1st October 2002 it sold the 1st machinery purchased on 1st April 2000 for Rs.365000. On 30th September 2003 it sold the second machinery purchased on 30th September 2000 for Rs.75000 and purchased another machinery for Rs.150000.

Depreciation was provided at the rate of 10% p.a. on original cost on 31st March each year.

Show the plant machinery account for the period, 2000-01 to 2003-04. (10 Marks)

- 4 a. Distinguish depreciation from obsolescence. (03 Marks)

- b. XYZ limited has the following capital structure:
- | | |
|-------------------------------------|----------------------|
| 10000 Equity shares of Rs.100 each | – Rs.1000000 |
| 10% 50000 Pref shares of Rs.10 each | – Rs. 500000 |
| 8% 5000 Debentures of Rs.100 each | – <u>Rs. 500000</u> |
| Total | – <u>Rs. 2000000</u> |

During the previous year the company made an operating profit (EBIT) of Rs.800000. Determine the earning per share (EPS), Dividend per share (DPS) and price earning ratio (P/E Ratio).

You may assume:

- Pay out policy of 50%
- Tax rate of 50%
- Market price per share Rs.200. (07 Marks)

- c. Give detailed explanation of any five accounting concepts. (10 Marks)

- 5 a. What is cash flow statement, how it differs from fund flow statement? (03 Marks)

- b. Elucidate the ways in which modern organizations will indulge in making their financial statements more attractive. (07 Marks)

- c. Write up the stores ledger for the following transactions under FIFO and weighted average method of materials issue:

September 2006

1. Materials in stores 500 kg; @ Rs.4 per kg.
3. Purchased 1000 kgs @ Rs.5 per kg.
4. Issued 600 kgs.
6. Found shortage of 10 kgs on physical verification.
8. Purchased 600 kgs @ Rs.6 per kg.
10. Issued 1000 kgs.
12. Purchased 400 kgs @ Rs.7 per kg. (10 Marks)

- 6 a. What are the advantages of maintaining Petty-cash book? (03 Marks)

- b. Describe the important provisions of companies act 1956, governing presentation of financial statements. (07 Marks)

- c. From the following balance sheets of Wilson and Co. for the year ending 31st March 2005 and 2006 prepare a statement showing sources and applications of funds and schedule of changes in working capital. (10 Marks)

Balance Sheet

Liabilities	2005	2006	Assets	2005	2006
Share Capital	400000	575000	Plant	75000	100000
Trade Creditors	106000	70000	Stock	121000	136000
P & L A/c	14000	31000	Debtors	181000	170000
			Cash	143000	270000
	520000	676000		520000	676000

Contd....3

- 7 a. Distinguish between cash accounting and accrual accounting. (05 Marks)
b. The following is the trial Balance of Lakshmi Co. Ltd. as at 31st December 2005:

Debit Balances:		Rs.	Credit Balance:		Rs.
Calls in arrears		5000	Share Capital		500000
Premises		750000	Sales		1000000
Machinery		150000	Reserve Fund		150000
Furniture		50000	Profit and Loss A/c		35000
Purchases		680000	Creditors		75000
Wages		125000	10% Debentures		400000
Salaries		60000	Bills Payable		10000
Interim Dividend		20000	Reserves for Doubtful		1000
Good will		200000	Debts		
Debtors		60000			21,71000
Bills Receivable		13000			
Bad debts		2000			
Debenture interest		15000			
(upto 30-6-2005)(After 25% tax)					
Stock on 1-January		41000			
		2171000			

Adjustments:

- The Stock on 31-12-2005 was valued at Rs.80000/-.
- Depreciate Machinery and furniture by 10%.
- Maintain Reserve for Doubtful Debts at 5% on Debtors.
- The directors proposed a final dividend at 15%.
- The debenture interest is unpaid for 6 months.

Prepare the Profit and Loss Account and draw up a Balance sheet.

(15 Marks)

8 Case Study:

The National Bank limited has been approached by two customers for a short term loan of Rs.50000/-. The following summarized financial information is available from the latest financial statements:

	Modern Foods Rs.	Fast Foods Rs.
Net Sales	910000	750000
Gross Profit Margin	382200	292500
Interest Expenses	20000	8200
Income Tax	75000	50000
Profit After Tax	82000	56250
Inventories	90000	65200
Debtors	70000	56000
Cash	6000	18000
Current Liabilities	182600	116000
Long-term Liabilities	160000	130000
Shareholders Equity	180000	140000

The bank intends to accept one of the two loan requests.

Required:

- Calculate the suitable ratios required by the Bank.
- Which customers loan request should be accepted? Why?
- What additional information may be useful in making a decision? (20 Marks)

NOTE: Assume that the year end account balances one representative of the whole year.

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First Semester MBA Degree Examination, Dec. 07 / Jan. 08
Statistics for Management

Time: 3 hrs.

Max. Marks:100

Note : 1. Answer any FIVE full questions.**2. The use of calculator and statistical table is permitted.**

- 1 a. Distinguish between questionnaire and schedule. (03 Marks)
b. A panel of men and women were asked by a consumer testing organization to rank 8 brands of tea according to taste. A rank of 1 was given to the best tasting tea and a rank of 8 to the worst.

Brand:	A	B	C	D	E	F	G	H
Panel of women (X):	5	4	3	6	7	8	1	2
Panel of Men (Y):	4	5	6	3	8	7	2	1

Determine how closely men's and women's taste in tea are related.

(07 Marks)

- c. The prices of tea company shares in Mumbai and Kolkata markets during the last ten months are recorded below:

Month	Mumbai	Kolkata
Jan	105	108
Feb	120	117
March	115	120
April	118	130
May	130	100
June	127	125
July	109	125
August	110	120
September	104	110
October	112	135

Determine in which market the share prices show lesser variability.

(10 Marks)

- 2 a. What is the significance of coefficient of determination? (03 Marks)
b. The following data relate to the age of employees and the number of days on which they reported sick in a month:

Age:	20	30	32	35	40	46	52	55	58	62
Sick days:	1	2	0	3	4	6	5	7	8	9

Calculate Karl Pearson's coefficient of correlation and interpret its value.

(07 Marks)

- c. The following data relate to advertising expenditure (in lakhs) and their corresponding sales (in crores):

Advertisement expenditure:	10	12	15	23	20
Sales:	14	17	23	25	21

Estimate: i) Sales corresponding to advertising expenditure of Rs.30 lakhs and
ii) The advertising expenditure for a sales target of Rs.35 crore.

(10 Marks)

- 3 a. Explain the utility of consumer price indices. (03 Marks)
b. Compute index number from the following data using fishers ideal index number (07 Marks)

Commodity	Base year		Current year	
	Quantity	Price	Quantity	Price
A	12	10	15	12
B	15	7	20	5
C	24	5	20	9
D	5	16	5	14

- c. Calculate the trend values by the method of least squares from the data given below and estimate the sales for the year 2011: (10 Marks)

Year	2003	2004	2005	2006	2007
Sale of TV sets (in '000)	12	18	20	23	27

- 4 a. What are the components of time series? (03 Marks)
b. An MBA applies for job in two firms X and Y. The probability of his being selected in firm X is 0.7 and being rejected at Y is 0.5. The probability of atleast one of his applications being rejected is 0.6. What is the probability that he will be selected in one of the firms? (07 Marks)

- c. A company has two plants to manufacture scooters. Plant I manufactures 80% of the scooters and plant II manufactures 20%. At plant I, 85 out of 100 scooters are rated standard quality or better. At plant II only 65 out of 100 scooters are rated standard quality or better.
- What is the probability that scooter selected at random came from plant I if it is known that scooter is of standard quality?
 - What is the probability that scooter selected at random came from plant II if it is known that scooter is of standard quality? **(10 Marks)**

- 5 a. A factory produces blades in packets of 10. The probability of a blade to be defective is 0.2%. Find the number of packets having two defective blades in a consignment of 10,000 packets. **(03 Marks)**
- b. The incidence of occupational disease in an industry is such that the workers have a 20% chance of suffering from it. What is the probability that out of six workers, four or more will have disease? **(07 Marks)**
- c. The average daily sales of 500 branch offices was Rs.150 thousand and the standard deviation Rs.15 thousand. Assuming the distribution to be normal, indicate how many branches have sales between: i) Rs.120 thousand and Rs.145 thousand ii) Rs.140 thousand and Rs.165 thousand. **(10 Marks)**

- 6 a. Explain central limit theorem. **(03 Marks)**
- b. Write a note on different random sampling methods. **(07 Marks)**
- c. Explain briefly the following terms: i) Type I and Type II error ii) Statistical inference iii) One tailed and two tailed test iv) Power of a statistical test v) Standard error. **(10 Marks)**

- 7 a. A machine is producing ball bearings with diameter of 0.5 inches. It is known that the standard deviation of ball bearings is 0.005 inches. A sample of 100 ball bearings is selected and their average diameter is found to be 0.498 inches. Determine the 99 percent confidence interval. **(03 Marks)**

- b. In a random sample of 1000 people from town A, 400 are found to be consumers of wheat. In a sample of 800 from town B, 400 are found to be consumers of wheat. Discuss the question if the data reveal a significant difference between A and B so far as the proportion of wheat consumers is concerned. **(07 Marks)**

- c. Intelligence test given to two groups of boys and girls gave the following information:

	Mean score	Standard deviation	Number
Girls	75	10	50
Boys	70	12	100

Is the difference in the mean scores of boys and girls statistically significant? Test at 1% level of significance. **(10 Marks)**

- 8 a. The mean weekly sales of chocolate bar in a store was 146.3 bars per store. After an advertising campaign the mean weekly sales in 22 stores for a typical week increased to 153.7 and showed a standard deviation of 17.2 was the advertising campaign successful? **(03 Marks)**

- b. The divisional manger of a retail chain believes the average number of customers entering each of the five stores in his division weekly is the same. In a given week, the manager reports the following number of customers in their stores:

3000, 2960, 3100, 2780, 3160.

Test the divisional manager's belief at 10% level of significance for $V = 4$, $\chi_{0.10}^2 = 13.277$.

(07 Marks)

- c. The following data represent the number of units of production per day turned out by 5 different workers using 4 different types of machines:

Workers	Machine Type			
	A	B	C	D
1	44	36	48	38
2	48	40	50	44
3	37	38	40	36
4	45	34	45	32
5	40	44	50	40

Test: i) Whether the mean productivity is the same for 4 different machines types

ii) Whether the 5 workers differ with respect to mean productivity.

(10 Marks)

- c. Compute the Laspeyres' and Paasche's price index numbers for the year 2007 using the following data concerning four commodities. Also find Fisher's ideal index for the same.

Quantity (kg)	Commodity			
	A	B	C	D
In 2006	8	10	15	20
In 2007	6	5	10	15
Price per kg (Rs.)				
In 2006	20	50	40	20
In 2007	40	60	50	20

(08 Marks)

- 5 a. What is time series analysis? What are the components of it? Explain briefly. (07 Marks)
- b. The mean lifetime of a sample of 400 fluorescent light bulbs produced by a company is found to be 1600 hours with a standard deviation of 150 hours. Test the hypothesis that the mean life time of the bulbs produced in general is higher than the mean life of 1570 hours at $\alpha = 0.01$ level of the significance. (05 Marks)
- c. Calculate the mode of the following distribution: (08 Marks)

Mid values:	5	15	25	35	45	55	65	75
Frequency:	7	15	18	23	31	14	13	10

- 6 a. What are the properties of normal curve? Explain the importance of it in statistics. (07 Marks)
- b. Use least squares regression line to estimate the increase in sales revenue expected from an increase of 7.5 percent in advertising expenditure. (05 Marks)

Firm	A	B	C	D	E	F	G	H
Annual % increase in advertising expenditure	1	3	4	6	8	9	11	14
Annual % increase in sales revenue	1	2	2	4	6	8	8	9

- c. A certain drug was administered to 456 males, out of 720 to test its efficiency against typhoid. The incidence of typhoid is shown below. Find out the effectiveness of the drug against the disease (Take $\chi^2_{0.05}$ for 1 df = 3.84). (08 Marks)

Administering Drug	Infection	No Infection	Total
		144	312
Without Administering Drug	192	72	264
Total	336	384	720

- 7 a. List the different methods of probability and non-probability sampling? Explain briefly the stratified sampling. (07 Marks)
- b. Fit a linear trend to the following data by least square method and also estimate the production for the year 2007: (05 Marks)

Year	1998	2000	2002	2004	2006
Production (in '000 units)	18	21	23	27	16

- c. The following table gives the automobile accident's data occurred in a city. Fit a Poisson's distribution to the data (08 Marks)

No. of accidents:	0	1	2	3	4
No. of days:	21	18	7	3	1

- 8 a. What is meant by ANOVA? What are the assumptions required for ANOVA testing? Also list the applications of ANOVA. (07 Marks)
- b. A machine produces 16 imperfect products in a sample of 500. After the machine is overhauled, it produces 3 products imperfect in a batch of 100. Has the machine's performance is increased? (05 Marks)
- c. What are the different steps involved in testing of hypothesis? Explain briefly in chronological order. (08 Marks)

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First Semester MBA Degree Examination, June-July 2009
Statistics for Management

Time: 3 hrs.

Max. Marks:100

Note:1. Answer any FIVE full questions.**2. Use of non programmable scientific calculators and statistical tables are allowed.**

- 1 a. Distinguish between a parameter and a statistic. (03 Marks)
- b. There are different types of variations we come across during time series analysis. What are they? Explain with examples. (07 Marks)
- c. Under what circumstances the following tests are used to draw the inferences?
- z – test
 - t – test
 - F – test
 - Chi-square test (10 Marks)
- 2 a. What do you understand by the notation $\alpha = 0.05$? (03 Marks)
- b. Explain the relationships between mean, median and mode through appropriate graphs/diagrams for the three distributional shapes viz., symmetrical, skewed to the right and skewed to the left. (07 Marks)
- c. Discuss the distinctive features of Binomial, Poisson and Normal distributions. When does a binomial distribution tend to become a normal distribution? (10 Marks)
- 3 a. What is the difference between standard error and sampling error? (03 Marks)
- b. The following is the information about the settlement of an industrial dispute in a factory. Comment on the gains and losses from the point of view of workers and that of management. (07 Marks)

	Before	After
Number of workers	3000	2900
Mean wages (Rs.)	2200	2300
Median wages (Rs.)	2500	2400
Standard deviation	300	260

- c. A highway maintenance authority has ordered a study of the amount of time vehicles must wait at a toll gate of a recently constructed highway which is severely clogged and accident prone in the morning. The following data were collected on the number of minutes that 950 vehicles waited in line in a typical day.

Waiting time (minutes)	No. of vehicles	Waiting time (minutes)	No. of vehicles
1.00 – 1.39	30	3.00 – 3.39	130
1.40 – 1.79	42	3.40 – 3.79	108
1.80 – 2.19	75	3.80 – 4.19	94
2.20 – 2.59	110	4.20 – 4.59	85
2.60 – 2.99	120	4.60 – 4.99	78

Construct an ogive and determine what percentage of the vehicles had to wait more than three minutes in line. (10 Marks)

- 4 a. What is a sample space? (03 Marks)
 b. Quarterly sales in Rs.(000) of a company are given below:

Quarter	Year		
	2005	2006	2007
I	7.2	7.4	8.4
II	5.0	6.8	6.0
III	7.8	7.4	6.2
IV	9.2	9.0	7.6

Calculate the seasonal indices.

(07 Marks)

- c. The following data relate to the scores obtained by 9 salesman of a company in an intelligence test and their weekly sales in Rs ('000s)

Salesman	A	B	C	D	E	F	G	H	I
Test Scores	50	60	50	60	80	50	80	40	70
Weekly scores	30	60	40	50	60	30	70	50	60

- i) Obtain the regression equation of sales on intelligence test scores of the salesman.
 ii) If the intelligence test score of a salesman is 65, what would be his expected weekly sales? (10 Marks)

- 5 a. What are Type I and Type II errors? (03 Marks)
 b. The following is the increase in D.A. in salaries of employees of a firm at the following rates:

Rs.250 for the salary range upto Rs.4749
 Rs.260 for the salary range from Rs.4750
 Rs.270 for the salary range from Rs.4950
 Rs.280 for the salary range from Rs.5150
 Rs.290 for the salary range from Rs.5350

No increase of D.A. for salary of Rs.5500 or more. What will be the additional amount required to be paid by the firm in a year which has 32 employees with the following salaries (in Rs.)? Solve through frequency distribution table. (07 Marks)

5422	4714	5182	5342	4835	4719	5234	5035
5085	5482	4673	5335	4888	4769	5092	4735
5542	5058	4730	4930	4978	4822	4686	4730
5429	5545	5345	5250	5375	5542	5585	4749

- c. 1000 students at college level are graded according to their IQ and their economic conditions. Use Chi-square test to find out whether there is any association between economic conditions and the level of IQ. (10 Marks)

Economic conditions	IQ levels			Total
	High	Medium	Low	
Rich	160	300	140	600
Poor	140	100	160	400
Total	300	400	300	1000

- 6 a. What is the difference between population and sample? (03 Marks)
 b. Calculate the price index number of 1996 with 1986 as base year by using,
 i) Laspeyre's
 ii) Paasche's
 iii) Fisher's formula (07 Marks)

6

Commodity	Unit	1986		1996	
		Price (Rs.)	Value (Rs.)	Qty (kg)	Value (Rs.)
A	Kg	10	1500	160	1760
B	Kg	12	1080	100	1300
C	Meter	150	900	60	960
D	Packets	9	450	40	480

- c. An examination was held to decide the award of a scholarship. The weights of various subjects were different. The marks obtained by 3 candidates (out of 100 in each subject) are given below:

Subject	Weight	Students		
		A	B	C
Mathematics	4	60	57	62
Physics	3	62	61	67
Chemistry	2	55	53	60
English	1	67	77	49

Calculate the weighted arithmetic mean to award the scholarship and select the student.

(10 Marks)

- 7 a. What is a scatter diagram? (03 Marks)
- b. The income of a group of 10000 persons was found to be normally distributed with mean Rs.1750 per month and standard deviation Rs.50. Show that of this group, 95% had income exceeding Rs.1668 and only 5% had income exceeding Rs.1832. What was the lowest income among the richest 100? (07 Marks)
- c. The following data relate to the age of the employees and the number of days they reported sick in a month.

Employees	1	2	3	4	5	6	7	8	9	10
Age	30	32	35	40	48	50	52	55	57	61
Sick day	1	0	2	5	2	4	6	5	7	8

Calculate the Karl Pearson's coefficient of correlation and interpret it.

(10 Marks)

- 8 a. What is the difference between a histogram and a barchart? (03 Marks)
- b. For a binomial distribution, mean is 4 and variance is 2. Find the probability of getting,
- At least 2 successes and
 - At most 2 successes. (07 Marks)
- c. Suppose that samples of polythene bags from two manufacturers A and B are tested by a buyer for bursting pressure, giving the following results:

Bursting Pressure	Number of Bags	
	A	B
5.0 – 9.9	2	9
10.0 – 14.9	9	11
15.0 – 19.9	29	18
20.0 – 24.9	54	32
25.0 – 29.9	11	27
30.0 – 34.9	5	13

- Which set of bags has the highest bursting pressure?
- Which has more uniform pressure? If the prices are the same, which manufacturer's bags would be preferred by the buyer and why? (10 Marks)

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05MBA13

First Semester MBA Degree Examination, June-July 2009 Statistics for Management

Time: 3 hrs.

Max. Marks:100

**Note: 1. Answer any FIVE full questions.
2. The use of statistical table is permitted.**

- 1 a. What do you mean by Statistics? Discuss the role of statistics in management. (07 Marks)
 b. The mean of 200 observations was 50. Later on, it was discovered that two observations were wrongly read as 92 and 8 instead of 192 and 88. Find out the correct mean. (05 Marks)
 c. The profits of Goodwill India Ltd from 2000-01 to 2005-06 are given below. Represent this data by a suitable bar diagram. (08 Marks)

Year	Profit (Rs. crores)
2000-01	85
2001-02	95
2002-03	110
2003-04	120
2004-05	65
2005-06	90

- 2 a. What do you mean by primary data and secondary data? Mention the methods of collecting primary data. (07 Marks)
 b. From the following data of wages of 7 workers compute the median wage
 Wages (in Rs) 1600, 1650, 1580, 1690, 1660, 1606, 1640. (05 Marks)
 c. Find the standard deviation from the weekly wages of ten workers in a factory. (08 Marks)

Workers	A	B	C	D	E	F	G	H	I	J
Wages (Rs)	320	310	315	322	326	340	325	321	320	331

- 3 a. What do you mean by time series analysis? Explain the components of time series. (07 Marks)
 b. Calculate the regression equations of X on Y from the following data.
 X: 1 2 3 4 5
 Y: 2 5 3 8 7 (05 Marks)
 c. Calculate the index from the following using Fisher's Ideal formula. (08 Marks)

Commodity	2004		2005	
	Base year		Current year	
	Price	Quantity	Price	Quantity
A	10	50	12	60
B	8	30	9	32
C	5	35	7	40

- 4 a. What do you mean by census and sampling? Explain any two types of sampling methods. (07 Marks)
 b. The mean age of a combined group of men and women is 30 years. If the mean age of the group of men is 32 and that of the group of women is 25, find out the percentage of men and women in the group. (05 Marks)
 c. Calculate the rank correlation coefficient for the following marks of 2 tests given to a candidate for a clerical job. (08 Marks)

First test	92	89	87	86	83	77	71	63	53	50
Second test	86	83	91	77	68	85	52	82	37	57

- 5 a. Discuss the procedure for hypothesis testing. (07 Marks)
 b. In a survey of 100 readers, it was found 40 read magazine A, 15 read magazine B, 10 read both. What is the probability of a person reading at least one of the magazines? (05 Marks)
 c. Fit a straight-line trend to the time series data. (08 Marks)

Year	2000	2001	2002	2003	2004
Sale of Sugar (in thousand kg)	80	90	92	93	94

- 6 a. What do you mean by tabulation of data? Explain various parts of a table. (07 Marks)
 b. Calculate the harmonic mean of numbers 10, 20, 25, 40, 50. (05 Marks)
 c. There are two branches of a company employing 100 and 80 persons respectively. If arithmetic means of the monthly salaries paid by two branches are Rs.1570 and Rs.1750 respectively, find the arithmetic mean of the salaries of the employees of the company as a whole. (08 Marks)

- 7 a. Discuss the advantages and limitations of Diagrams and Graphs. (07 Marks)
 b. The monthly income (in Rs) of 10 persons working in a firm are as follows. 1487, 1493, 1502, 1446, 1475, 1492, 1572, 1516, 1468, 1489. Find the average and total monthly income. (05 Marks)
 c. Find out the coefficient of correlation by Karl Pearson's method between X and Y. (08 Marks)

X	57	42	40	33	42	45	42	44	40	56	44	43
Y	10	60	30	41	29	27	27	19	18	19	31	29

- 8 a. What is meant by correlation? Briefly explain scatter diagram. (07 Marks)
 b. Calculate the average deviation and co-efficient of average deviation from the following data. (05 Marks)
 Income (Rs) : 4,000 4,200 4,400 4,600 4,800
 c. The profits earned by 100 companies during 2004-05 are given below.

Profits (lakhs)	No. of companies
20-30	4
30-40	8
40-50	18
50-60	30
60-70	15
70-80	10
80-90	8
90-100	7

Calculate Q_1 , Median, D_4 , P_{80}

(08 Marks)

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08MBA13

First Semester MBA Degree Examination, Dec.08/Jan.09
Statistics for Management

Time: 3 hrs.

Max. Marks:100

Note : 1. Answer any FIVE full questions.
2. Use of Statistical tables permitted.

- 1 a. What is Statistics? List and explain the five stages in a Statistical investigation. (06 Marks)
b. Mean of 100 observations is found to be 40. If at the time of computation two items are wrongly taken as 30 and 27 instead of 3 and 72, find correct Mean? (04 Marks)
c. The following table gives the wages of the workers in a certain factory.

Daily wages (Rs)	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70
No. of Workers	21	29	19	39	43	94	73	68	36	45

70-75	75-80	80-85	85-90	90-95
27	48	21	12	5

Draw Histogram and less than ogives for the above table. Also calculate the number of workers between the wages 55 and 77. (10 Marks)

- 2 a. What is Primary and Secondary data? Explain various methods of collecting Primary data. (06 Marks)
b. Calculate the lower and upper Quartiles, third decile and 20th percentile for the following data. (06 Marks)

Control value	2.5	7.5	12.5	17.5	22.5
Frequency	7	18	25	30	20

- c. The median and mode of the following distribution are known to be 33.5 and 34 respectively. Three frequency values from the table, however, are missing. Find the missing values. (08 Marks)

Wages (Rs)	0-10	10-20	20-30	30-40	40-50	50-60	60-70	Total
Frequency	4	16	?	?	?	6	4	230

- 3 a. What is Dispersion? List various methods of studying dispersion and also explain Absolute and Relative measures of Dispersion. (08 Marks)
b. For a moderately skewed data, the arithmetic mean is 200, the coefficient of variation is 8 and Karl Pearson's coefficient of skewness is 0.3. Find the mode and the Median? (06 Marks)
c. The scores of two batsman A and B in ten innings during a certain season are given below. Find which of the two batsman A or B is more consistent in scoring? (06 Marks)

A	32	28	47	63	71	39	10	60	96	14
B	19	31	48	53	67	90	10	62	40	80

- 4 a. What is correlation analysis? List out and explain briefly the methods of studying correlation. (06 Marks)
- b. Calculate Rank correlation coefficient between marks assigned to 10 students by judges X and Y in a certain competitive test. (06 Marks)

Marks given by Judge X	52	53	42	60	45	41	37	38	25	27
Marks given by Judge y	65	68	43	38	77	48	35	30	25	50

- c. The below given data relate to the score obtained by 9 salesmen of a company in an intelligence test and their weekly sales in thousands of rupees. (08 Marks)

Salesman	A	B	C	D	E	F	G	H	I
Intelligence test score	50	60	50	60	80	50	80	40	70
Weekly sales	30	60	40	50	60	30	70	50	60

- i) Obtain the regression equation of sales on intelligence test scores of the salesman.
- ii) If the intelligence score of a salesman is 65, what would be his expected sales?

- 5 a. Define Time Series and list various components of time series. Also explain various methods used for determining Trend. (06 Marks)
- b. Calculate i) Pasche's; ii) Laspeyre's; and iii) Fisher's index numbers for the below given data. (06 Marks)

Commodity	2006		2007	
	Price	Quantity	Price	Quantity
A	12	20	15	25
B	10	8	16	10
C	15	2	12	1
D	60	1	65	1
E	3	2	10	1

- c. Calculate seasonal indices by the 'Ratio to moving average' method from the following data. (08 Marks)

Year	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter
2005	68	62	61	63
2006	65	58	66	61
2007	68	63	63	67

- 6 a. Define Probability? Explain with examples the addition theorem and multiplication theorem of Probability. (05 Marks)
- b. The number of defects per unit in a sample of 330 units of manufactured product was given below. Fit a Poisson distribution to the data (given $e^{-0.439} = 0.6447$). (06 Marks)

No. of defects	0	1	2	3	4
No. of units	214	92	20	3	1

- c. In a manufacturing organization, the distribution of wages was perfectly normal and the number of workers employed in the organization was 5000. The mean wages of workers were calculated at Rs.800 per month and the standard deviation was worked out to Rs.200. On the basis of information estimate.
- i) The number of workers getting Salary between Rs.700 and Rs.900.
- ii) Percentage of workers getting Salary above Rs.1000.
- iii) Percentage of workers getting Salary below Rs.600. (09 Marks)

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First Semester MBA Degree Examination, Dec 08 / Jan 09
Statistics for Management

Time: 3 hrs.

Max. Marks:100

Note : Answer any FIVE full questions.

- 1 a. Define the term statistics and discuss its functions and limitations. (08 Marks)
b. Draw a pie diagram to represent the following data of proposed expenditure by a State Government for the year 2007 – 08. (06 Marks)

Items	Agricultural and Rural development	Industries and Urban development	Health and education	Misc
Proposed expenditure (in million Rs)	4,200	1,500	1,000	500

- c. The following table gives the frequency distribution of the weekly wages (in '00 Rs) of 100 workers in a factory.

Weekly wages ('00 Rs)	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	Total
	4	5	12	23	31	10	8	5	2	100

Draw the histogram and frequency polygon of the distribution (Use graph sheet) (06 Marks)

- 2 a. Explain the various measures of central tendency. (08 Marks)
b. Find mean, median and mode from the following data. (12 Marks)

Weight (in kgs)	93-97	98-102	103-107	108-112	113-117	118-122	123-127	128-132
No. of students	3	5	12	17	14	6	3	1

- 3 a. Explain the various measures of dispersion. (08 Marks)
b. The means of 2 samples of sizes 50 and 100 respectively are 54.1 and 50.3 and the standard deviations are 8 and 7. Obtain the standard deviation of the sample of size 150 obtained by combining the two samples. (03 Marks)
c. Find i) Interquartile Range ii) Quartile deviation iii) Coefficient of Quartile deviation for the following distribution. (09 Marks)

CI	0-15	15-30	30-45	45-60	60-75	75-90	90-105
F	8	26	30	45	20	17	4

- 4 a. Define correlation. Explain the various types of correlation with suitable examples. (08 Marks)
b. Calculate Karl Pearson's coefficient of correlation between expenditure on advertising and sales from the following data. (12 Marks)

Advertising expenses (1000 Rs)	39	65	62	90	82	75	25	98	36	78
Sales (lakh Rs)	47	53	58	86	62	68	60	91	51	84

- 5 a. What is a Time Series? What are its main components? (08 Marks)
b. Fit a straight line trend to the following data by the Least Square Method. Estimate the production in the year 1999. (08 Marks)

Year	1990	1992	1994	1996	1998
Production ('000 units)	18	21	23	27	16

- c. From the following data, construct Laspeyse's and Paasche Price Index Number with base 2005. (04 Marks)

Commodity	2005		2006	
	Price	Quantity	Price	Quantity
A	4	2	6	3
B	3	5	2	1
C	8	2	4	6

- 6 a. Define i) Binomial distribution ii) Poisson distribution with one example each. Also write down any three properties of Normal distribution. (08 Marks)
- b. Fit a binomial distribution to the following data. (08 Marks)

x	0	1	2	3
f	28	62	46	10

- c. If 5% of the electric bulbs manufactured by a company are defective, use Poisson distribution to find the probability that in a sample of 100 bulbs.
i) none is defective ii) 5 bulbs will be defective (Given $e^{-5} = 0.007$) (04 Marks)

- 7 a. Explain sampling and non – sampling errors. (08 Marks)
- b. From the following data, obtain the two Regression equations. (12 Marks)

Sales	91	97	108	121	67	124	51	73	111	57
Purchases	71	75	69	97	70	91	39	61	80	47

- 8 a. Explain the procedure for testing hypothesis. (04 Marks)
- b. Explain Type I and Type II errors. (04 Marks)
- c. In a certain sample of 2000 families, 1,400 families are consumers of tea. Out of 1,800 Hindu families, 1,236 families consume tea. Use X^2 – test and state whether there is any significant difference between consumption of tea among Hindu and non – Hindu families
[$X^2_{0.05}$ for 1df = 3.841] (08 Marks)
- d. A machine is designed to produce insulating washers of average thickness of 0.025cm for electrical devices. A random sample of 10 washers was found to have an average thickness of 0.024cm with a standard deviation of 0.002cm. Test the significance of the deviation. Value of 't' for 9 degree of freedom at 5% level is 2.262. (04 Marks)

- 7 a. What are the various methods of Sampling and explain in brief the different probability sampling methods. (06 Marks)
- b. Ten oil tins are taken at random from an automobile filling machine. The mean weight of the 10 tins is 15.8 kg and standard deviation 0.5 kg. Does the sample mean differ significantly from the intended weight of 16 kg? (Given: For $v = 9$, $t_{0.05} = 2.26$). (06 Marks)
- c. 1000 families were selected at random in a city to test the belief that high income families usually send their children to Public schools and the low income families often send their children to government schools. The following results were obtained. Test whether income and type of schooling are independent. (08 Marks)

Income	School		Total
	Public	Government	
Low	370	430	800
High	130	70	200
Total	500	500	1000

- 8 a. What is ANOVA? Explain the steps involved in carrying out ANOVA. (06 Marks)
- b. Two samples are drawn from two normal populations and their values are given hereunder. Test whether the two samples have the same variance at 5% level (For $v_1=9$ and $v_2=7$, $F_{0.05}=3.68$). (06 Marks)

Sample 1	60	65	71	74	76	82	85	87		
Sample 2	61	66	67	85	78	63	85	86	88	91

- c. The following figures relate to the number of units sold in five different areas by four salesmen.

Area	Salesman			
	A	B	C	D
1	80	100	95	70
2	82	110	90	75
3	88	105	100	82
4	85	115	105	88
5	75	90	80	65

Is there a significance difference in the efficiency of these salesmen? (Given: $F_{0.05}=3.24$ for $v_1=3$ and $v_3=16$). (08 Marks)

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08MBA13

First Semester MBA Degree Examination, Dec.09/Jan.10
Statistics for Management

Time: 3 hrs.

Max. Marks:100

Note: 1. Answer any FIVE full questions.
2. The use of calculator and statistical table is permitted.

- 1 a. Define the term 'statistics' and discuss its functions and limitations. (06 Marks)
b. Draw a pie diagram to represent the following data. Given the area in millions of sq.km, of oceans of the world. (06 Marks)

Ocean	Area (millions sq.km)
Pacific	70.8
Atlantic	41.2
Indian	28.5
Antartic	7.6
Arctic	4.8

- c. Draw a less than cumulative frequency curve for the following data and find from the graph the value of seventh decile. (08 Marks)

Monthly income	No. of workers	Monthly income	No. of workers
0 – 100	12	500 – 600	20
100 – 200	28	600 – 700	20
200 – 300	35	700 – 800	17
300 – 400	65	800 – 900	13
400 – 500	30	900 – 1000	10

- 2 a. Name the various measures of central tendency. Hence explain any one of them. (06 Marks)
b. Find the value of mean, mode and median from the data given bellow:

Weight (in kg) :	93 – 97	98 – 102	103 – 107	108 – 112	113 – 117	118 – 122
No. of students :	3	5	12	17	14	6

123 – 127	128 – 132
3	1

(06 Marks)

- c. Find the : i) Lower quartile ; ii) Upper quartile ; iii) 7th decile and iv) 60th percentile for the following frequency distribution. (08 Marks)

Wages (Rs.) :	30 – 40	40 – 50	50 – 60	60 – 70	70 – 80	80 – 90	90 – 100
No. of persons :	1	3	11	21	43	32	9

- 3 a. Define dispersion. What are the characteristics for an ideal measure of dispersion? (06 Marks)
b. Calculate the mean and standard deviation from the following data: (06 Marks)

Value :	90 – 99	80 – 89	70 – 79	60 – 69	50 – 59	40 – 49	30 – 39
Frequency:	2	12	22	20	14	4	1

- c. Calculate Karl Pearson's co-efficient of Skewness from the following data: (08 Marks)

Size :	1	2	3	4	5	6	7
Frequency :	10	18	30	25	12	3	2

- 4 a. Define correlation and regression. Distinguish between positive and negative correlation. (06 Marks)
b. Calculate Spearman's rank correlation coefficient between advertisement cost and sales from the following data: (06 Marks)

Advertisement ('000 Rs) :	39	65	62	90	82	75	25	98	36	78
Sales (lakhs Rs) :	47	53	58	86	62	68	60	91	51	84

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, or use of calculator and/or equations written eg, $42+8=50$, etc. be treated as malpractice.

- c. From the following data, obtain the regression equations: (08 Marks)

Sales :	91	97	108	121	67	124	51	73	111	57
Purchases :	71	75	69	97	70	91	39	61	80	47

- 5 a. Define time series analysis. What are its main components? (06 Marks)
 b. From the following data, calculate price index numbers for 1980 with 1970 as base by,
 i) Laspeyre's method ; ii) Paasche's method and iii) Fisher's ideal method. (07 Marks)

Commodities	1970		1980	
	Price	Quantity	Price	Quantity
A	20	8	40	6
B	50	10	60	5
C	40	15	50	15
D	20	20	20	25

- c. The sales of a company in million of rupees for the years 1994 – 2001 are given below:

Year :	1994	1995	1996	1997	1998	1999	2000	2001
Sales :	550	560	555	585	540	525	545	585

- i) Find the linear trend equation ; ii) Estimate the sales for the year 1993. (07 Marks)
- 6 a. Define : i) Probability ; ii) Binomial distribution ; iii) Poisson distribution with one example each. (06 Marks)
 b. In a bolt factory, machines A, B and C manufacture 25%, 35% and 40% respectively of the total. Of their output 5, 4 and 2 percent are known to be defective bolts. A bolt is drawn at random from the product and is found to be defective. What are the probabilities that it was manufactured by machines B or C? (07 Marks)
 c. If 5% of the electric bulbs manufactured by a company are defective, use Poisson distribution to find the probability that in a sample of 100 bulbs
 i) None is defective ; ii) 5 bulbs will be defective (given : $e^{-5} = 0.007$). (07 Marks)
- 7 a. Explain : i) Census method ; ii) Sample method. (06 Marks)
 b. Explain the procedure of hypothesis test describing various stages involved. (08 Marks)
 c. If 10% of the spark plugs are noted as defective from previous experience, what should be the sample size to be selected for inspection at 95% confidence level with 5% of marginal error? (06 Marks)
- 8 a. Define the terms : i) Type I and type II errors ; ii) One tailed and two tailed test. (06 Marks)
 b. The theory predicts the proportion of beans, in the four groups A, B, C and D should be 9:3:3:1. In an experiment among 1,600 beans, the numbers in the four groups were 882, 313, 287 and 118. Does the experimental result support the theory? (The table value of X^2 for 3 d.f. at 5% level of significance is 7.81). (06 Marks)
 c. A manufacturing company has purchased three new machines of different makes and wishes to determine whether one of them is faster than the others in producing a certain output. Five hourly production figures are observed at random from each machine and the results are given in table below:

	Machine A ₁	Machine A ₂	Machine A ₃
Observations	25	31	24
	30	39	30
	36	38	28
	38	42	25
	31	35	28

Use analysis of variance technique and determine whether the machines are significantly different in their mean speeds. [Use $\alpha = 5\%$ value of F for (2,12) d.f. is 3.89]. (08 Marks)

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First Semester MBA Degree Examination, Dec.09/Jan.10
Statistics for Management

Time: 3 hrs.

Max. Marks:100

Note: 1. Answer any Five full questions.
2. Use of Statistical tables permitted.

- 1 a. Discuss the advantages and limitations of diagrams. (07 Marks)
b. Calculate Karl-Pearson's coefficient of correlation from the following data using 20 as the working mean for price and 70 as working mean for demand. (05 Marks)

Price :	15	16	17	18	19	20	21	22	23
Demand :	84	78	70	75	66	67	62	58	60

- A random sample of 100 items taken from a large batch of articles, contain 5 defective items.
c. i) Set up 95% confidence limits for the proportion of defective items in the batch.
ii) If the batch contains 2669 items, set up 95% confidence interval for proportion of defective item. (08 Marks)

- 2 a. What is regression? Explain properties of regression lines. (07 Marks)
b. An incomplete frequency distribution is given below :

x :	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60	60 – 70	70 – 80
f :	12	30	?	65	?	25	18

Given that total number of frequency is 229 and median is 46, determine the missing frequency using median formula. (05 Marks)

- c. A researcher wants to find the relationship, if any between the heights of sons and the heights of the fathers. He took a random sample of six fathers and their six sons. Their heights in inches are given below. Find the regression line of y on x and hence find the height of the son if father's height is 70 inches. (08 Marks)

Height of father (x):	63	65	66	67	67	68
Height of son (y) :	66	68	65	67	69	70

- 3 a. Distinguish between : i) Population and sample ii) Statistic and parameter. Discuss the relative merits of census and sample methods of collecting data. (07 Marks)
b. Determine the period of the moving average for the following data and calculate moving averages for that period (05 Marks)

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
value	130	127	124	135	140	132	129	127	145	158	153	146	145	164	170

- c. For the data given below draw less than and more than ogive and hence find the value of median. Convert the following distribution into more than frequency distribution. (08 Marks)

Weekly wages less than (Rs)	20	40	60	80	100
No. of workers	41	92	156	194	201

- 4 a. What are the measures of central tendency? What are the desired qualities of an ideal measure of central tendency? (07 Marks)
b. A bag contains 7 red, 12 white and 4 green balls. What is the probability that
i) The 3 balls drawn are all white
ii) 3 balls drawn are one of each colour. (05 Marks)
c. The number of telephone lines busy at a particular time is a binomial variate with probability 0.1 that a line is busy. If 10 lines are selected at random, what is the probability that
i) No line is busy ii) At least one line is busy iii) Atmost two lines are busy. (08 Marks)

- 5 a. What do you mean by time series? Explain the components of time series? (07 Marks)
 b. Calculate the appropriate measures of dispersion from the following data.

Wages in Rs.:	Below 35	35 – 37	38 – 40	41 – 43	Over 43
No. of workers :	14	60	95	24	7

(05 Marks)

- c. Compute Fisher's ideal index number and apply factor reversal test

Commodity	Base Year		Current Year	
	Price (in '00Rs)	Expenditure price (in '00Rs)	Price (in '00Rs)	Expenditure price (in '00Rs)
A	5	25	10	60
B	1	10	2	24
C	4	16	8	40
D	2	40	5	78

(08 Marks)

- 6 a. Explain Type I and Type II error. What are the uses of χ^2 test? (07 Marks)
 b. Calculate rank correlation of the following data

Maths marks (x)	85	60	73	40	90
Statistics marks (y)	93	75	65	50	80

(05 Marks)

- c. A survey predicts the proportion of beam in the four groups A, B, C and D should be 9 : 3 : 3 : 1. In an experiment among 1600 beams, the numbers in the four groups were 882, 313, 287 and 118. Does experiment result support the survey? Use χ^2 test, $\alpha = 0.05$. (08 Marks)

- 7 a. Explain the terms i) Critical region ii) One tailed and two tailed test iii) Critical value. (07 Marks)
 b. The maximum temperature on June 1st in a certain locality has been recorded over years. About 15% of the time it has exceeded 30°C and about 5% of the time it has been less than 20°C. If the temperature is a normally distributed random variable what are its mean and variance. (05 Marks)
 c. Four salesmen were posted indifferent area by a company. The number of units of commodity x sold by them are as follows.

Sales man	Units sold			
A	20	23	28	29
B	25	32	30	21
C	23	28	35	18
D	15	21	19	25

Use one way classification method for analysis of variance for the data and test whether the difference is significant in the performance of these sales men. (08 Marks)

- 8 a. Briefly describe 't' test and its properties. (07 Marks)
 b. Draw histogram and hence obtain frequency polygon

C. I	20 – 25	25 – 27.5	27.5 – 30	30 – 31	31 – 32	32 – 33
f	1	7	15	10	15	17

(05 Marks)

- c. Two independent random samples are drawn from normal populations with the same variance. The sample results are given below

$n_1 = 4$, $\bar{x}_1 = 12$, $s_1 = 4$, $n_2 = 5$, $\bar{x}_2 = 10$, $s_2 = 3$ where s_1^2 and s_2^2 are unbiased estimates of common population variance σ^2 . Obtain 90% confidence interval for $\mu_1 - \mu_2$ using 't' test.

(08 Marks)

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First Semester MBA Degree Examination; May/June 2010
Statistics for Management

Time: 3 hrs.

Max. Marks:100

Note: 1. Answer any FOUR full questions from Q.No.1 to Q.No.7.
2. Question No.8 is compulsory.

- 1 a. Discuss briefly the different methods of sampling. Explain and illustrate their merits and demerits. (07 Marks)
- b. In a certain examination the average grade of all students in class A is 68.4 and students in class B is 71.2. If the average of both classes combined is 70, find the ratio of the number of students in class A to the number of students in class B. (05 Marks)
- c. The personnel manager of a factory wants to find a measure which he can use to fix the monthly income of the persons applying for a job in the production department. As an experimental project, he collected following data on 7 persons from that department, referring to years of service and their monthly income.

Years of service :	11	7	9	5	8	6	10
Income (in '000) :	10	8	6	5	9	7	11

- i) Fit the regression equation of income on years of service.
- ii) Using it, what initial start would you recommend for a person applying for job, having served in similar capacity in another factory for 13 years? (08 Marks)
- 2 a. What is meant by the theoretical frequency distribution? List out the properties of the binomial, Poisson and normal distributions. (07 Marks)
- b. A company has two plants to manufacture scooters. Plant I manufactures 80% of the scooters and plant II manufactures 20%. At plant I, 85 out of 100 scooters are rated standard quality or better. At plant II, only 65 out of 100 scooters are rated standard quality or better.
- i) What is the probability that a scooter selected at random came from plant I, if it is known that the scooter is of standard quality? ii) What is the probability that a scooter selected at random came from plant II, if it is known that the scooter is of standard quality? (05 Marks)
- c. A detergent maker has decided to change the appearance of the box. It has come up with four potential replacements, which are called A, B, C and D. It shows the four designs to 400 randomly selected consumers, and ask them which design they like the best. Here are the results:

Design	A	B	C	D
Consumers	107	105	122	66

At the 0.05 level of significance, test the claim that all consumers like the four designs equally. (08 Marks)

- 3 a. What are the desirable properties for an average? Under what circumstances would it be appropriate to use mean, mode, median and GM? Discuss. (07 Marks)
- b. The following table gives indices of industrial production of registered unemployed (in hundred thousand). Calculate the value of the Karl Pearson's coefficient correlation.

Year	1991	1992	1993	1994	1995	1996	1997	1998
Index of production	100	102	104	107	105	112	103	99
No. unemployed	15	12	13	11	12	12	19	26

(05 Marks)

- c. Draw an ogive for the following distribution. How many workers earned wages between Rs.1365 and Rs.1430? Also calculate the median wage.

Wages (Rs)	1000-1100	1100-1200	1200-1300	1400-1500	1500-1600	1600-1700
No. of workers	6	10	22	16	14	12

(08 Marks)

- 4 a. What is an index number? Give Laspeyre's, Paasche's and Fisher's index numbers. Which one is the best and why? (07 Marks)
- b. A market research firm is interested in surveying certain attitudes in a small community. There are 125 households broken down according to income, ownership of a telephone and ownership of a T.V.

	Households with annual income of Rs.8000 or less		Households with annual income above Rs.8000	
	Telephone subscriber	No telephone	Telephone subscriber	No telephone
Own TV set	27	20	18	10
No TV set	18	10	12	10

- i) What is the probability of obtaining a TV owner in drawing at random?
- ii) What is the conditional probability of drawing a household that owns a TV, given that the household is a telephone subscriber? (05 Marks)
- c. From the following data construct a price index number of the group of four commodities using the appropriate formula:

Commodity	Base year		Current year	
	Price for unit (Rs.)	Expenditure (Rs.)	Price for unit (Rs.)	Expenditure (Rs.)
A	2	40	5	75
B	4	16	8	40
C	1	10	2	24
D	5	25	10	60

(08 Marks)

- 5 a. Briefly explain the various methods of determining trend in a time series. Explain the merits and demerits of each method. (07 Marks)
- b. The coefficient of rank correlation of the marks obtained by 10 students in statistics and accountancy was found to be 0.2. It was later discovered that the difference in ranks in the two subjects obtained by one of the students was wrongly taken as 9 instead of 7. Find the correct coefficient of rank correlation. (05 Marks)
- c. Below are given the annual production (in thousand tonnes) of a fertilizer factory:

Years	1997	1998	1999	2000	2001	2002	2003
Production	70	75	90	91	95	98	100

Fit a straight line trend by the method of least squares and tabulate the trend values.

(08 Marks)

- 6 a. Show clearly the necessity and importance of diagrams in statistics. What precautions should be taken in drawing a good diagram? (07 Marks)
- b. The heights of adult females are normally distributed with a mean of 63.6 inches and a standard deviation of 2.5 inches. Find the probability that a randomly selected female is 5 feet tall or shorter. (05 Marks)

- c. The following data represent the number of units of production per day, turned out by 5 different workers, using 4 different types of machines:

Workers	Machine type			
	A	B	C	D
1	44	38	47	36
2	46	40	52	43
3	34	36	44	32
4	43	38	46	33
5	38	42	49	39

Test whether the mean productivity is the same for different machines. Test whether the 5 men differ with respect to mean productivity. (08 Marks)

- 7 a. What is coefficient of variation? What purpose does it serve? Also distinguish between 'variance' and 'coefficient of variation'. (07 Marks)
- b. The number of employees, wages per employee and the variance of the wages per employee for two factories are give below:

	Factory A	Factory B
No. of employees	100	150
Average wage per employee per month (Rs.)	3200	2800
Variance of the wages per employee per month (Rs.)	625	729

In which factory is there greater variation in the distribution of wages per employee?

(05 Marks)

- c. A statistics professor has designed a final exam that he believes will produce a mean score of 70. Mr. Sriram, one of his colleagues, disagrees, claiming that the mean score for all statistics students in this exam will be below 70. Mr. Sriram randomly selects 38 statistics students and gives them the exam. Here are their scores:

32	41	43	44	46	46	47	48	49	52
54	54	56	57	58	58	60	60	65	66
66	67	67	68	68	68	68	72	76	83
87	92	92	94	100	50	61	71		

Use this sample data to test Mr. Sriram's claim at the 0.01 level of significance. (08 Marks)

- 8 a. Explain the procedure generally followed in testing of a hypothesis. Point out the difference between one tailed and two tailed tests. (07 Marks)

- b. Calculate geometric mean from the following data:

125 1462 38 7 0.22 0.08 12.75 0.5

(05 Marks)

- c. The screws produced by a certain machine were checked by examining samples of 12. The following table shows the distribution of 128 samples according to the number of defective items they contained.

No. of defectives	0	1	2	3	4	5	6	7
No. of samples	7	6	19	35	30	23	7	1

Fit a binomial distribution and find the expected frequencies if the chance of machine being defective is $\frac{1}{2}$. (08 Marks)

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