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I Semester M.B.A. Examination, February 2019
(CBCS Scheme)
Management
Paper – 1.4 : STATISTICS FOR MANAGEMENT

Time : 3 Hours Max. Marks : 70

Instructions : 1) *Calculators and appropriate statistical tables are* ***allowed.***
2) ***Provide*** *the graph sheet.*

SECTION – A

Answer **any five** questions. **Each** question carries **five** marks. **(5×5=25)**

1. Explain the importance of statistics in management.

2. Write short notes on :
   a) Null hypothesis
   b) Alternative hypothesis
   c) Type I and Type II error.

3. A bag contains 5 white and 6 red marbles. Another bag contains 4 white and 7 red marbles. Two marbles are drawn from the selected bag. What is the probability that selected bag contains (a) white marbles (b) one white and one red marble.

4. Fit a linear trend for the following data and forecast for the next two years (A graph is necessary).

Year	:	2012	2013	2014	2015	2016	2017
Sale of sugar '000 kgs	:	80	90	92	94	96	98

5. Derive Chi-square statistic by stating suitable null and alternative hypothesis. Use 1% level of significance.

   The data given below is regarding infavour of against and indifferent to a National Policy on FDI.

Occupation	Favour of	Against	Indifferent
Social workers	80	30	10
Lawyers	70	60	20
University students	60	60	40

P.T.O.

6. Calculate Karl Pearson's and Bowley's coefficient of skewness for the marks obtained by students of 2 institutions.

Measure	Institution A	Institution B
Mean	65	70
Standard deviation	10	14
Middle quartile	65	64
Third quartile	87	102
First quartile	28	35

7. The average height of 1000 students are normally distributed. Its mean is 72 inches and standard deviation is 2 feet. Find
   i) The number of students whose height is more than 68 inches.
   ii) The number of students whose height will be between 5.5 feet and 6.25 feet.

SECTION – B

Answer **any three** questions. **Each** question carries **10** marks. **(3×10=30)**

8. What is non parametric test ? Explain the different types of test used in the statistical analysis.

9. Calculate the ideal index and test for the time reversal and factor reversal test for the following data.

	2017		2018	
Commodity	Price	Expenditure	Price	Expenditure
A	30	1350	22	990
B	32	1344	24	840
C	30	1200	25	1200
D	35	2100	27	1161
E	36	900	28	1036

10. An investment company speculates about the relationship between family incomes and their allocation for investments. A survey of 8 randomly selected families gives the following data.

Annual income in '000 Rs. :	18	21	19	34	23	30	36	39
Percent allocation for investment :	28	36	32	40	35	55	60	70

a) Develop the regression equations to describe the data.

b) What could be the percentage of income allocated to investment by a family earnings Rs. 27,500 per annum ?

11. A businessman from Delhi wishes to sell his products in Bangalore. He can set up a showroom in the city or can sell through a wholesaler. Setting up a showroom will entail cost of Rs. 7,25,000 with a 65% probability of success. If the showroom succeeds, he can get a net profit of Rs. 12,25,000 per year. If it fails, he can either shutdown the showroom or rent it out for an annual rent of Rs. 4,25,000 (for rest of the year). The probability that he gents rent for the showroom is 45%.

If he sells through a wholeseller, he incurs Rs. 3,25,000 initial costs. The chances of selling successfully are 48% with a net profit of Rs. 6,20,000 per year.

a) Advise the businessman on the best decision.

b) How is the decision tree analysis useful in business decision ?

SECTION – C

12. **Compulsory :** **(1×15=15)**

A manufacturer of perfumes wishes to launch a new perfume in 4 different fragrances. Test marketing in 5 different cities has given the following data. Is there a significant difference in the sales figures of the various fragrances ?

	Lavender	**Rose**	**Lily**	**Daisy**
City A	80	100	95	70
City B	82	110	90	75
City C	88	105	100	82
City D	85	115	105	88
City E	75	90	80	65

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I Semester M.B.A. Degree Examination, January/February 2018
(CBCS) (2014-15 and Onwards)
MANAGEMENT
Paper – 1.4 : Statistics for Management

Time : 3 Hours Max. Marks : 70

Instruction : Calculators and statistical tables are allowed.

SECTION – A

Answer any five questions from the following. Each question carries five marks. (5×5=25)

1. Briefly explain with illustrations how tables and graphs may be used to present data.

2. Explain the concepts of skewness and kurtosis with suitable illustrations.

3. Calculate the straight line trend through the method of least squares for the data given below :

	2013	2014	2015	2016	2017
Production in M.T	186	194	210	225	235

Also find the possible production figures of 2018 and 2019.

4. Using the Chi Square Test, determine whether the medicine given to cattle was effective or not.

	Took Medicine	Did not take Medicine	Total
Fell ill	150	230	380
Did not fall ill	375	420	795
Total	525	650	1175

You may use a 5 percent level of significance.

P.T.O.

6. Use the coefficient of variation to determine which of the 2 students are consistent in performance.

Data is	Maths	Science	History	Geography
Student A	78	76	82	79
Student B	90	87	90	40

8. What is meant by sampling? Explain two different methods of sampling.

7. A company manufactures metal beams. The monthly production is 4500 beams. If the average diameter of the beams is 8 cm and the standard deviation is 3 cm, find:

a) How many beams have a diameter between 9 cm and 12 cm.

b) How many beams have a diameter between 5 cm and 2 cm.

Illustrate every answer with a suitable diagram.

SECTION – B

Answer any 3 questions. Each carries 10 marks. (3x10=30)

9. A businessman has 2 options for investment

Option A: He can open a restaurant for Rs. 10,00,000. He can expect success with a cash inflow of Rs. 14,00,000 at a probability of 75 per cent. If he fails, he can still salvage Rs. 3,00,000.

When he succeeds he can open a food truck for Rs. 7,00,000. The chances of success are 80 per cent with a cash inflow of Rs. 9,00,000. If he fails, he loses Rs. 1,00,000.

Option B : He can open a Gym for Rs. 12,00,000. The chances of success are 90 per cent with a cash inflow of Rs. 5,00,000. If he fails, he can still salvage Rs. 5,00,000.

You are expected to:

a) Draw a decision tree.

b) Construct a pay off table and opt it. Your decision is to which option is profitable for the businessman.

9. Find Fischer's ideal index for the following data and prove that it satisfies the factor reversal and time reversal tests.

Components	P_0	P_1	Q_0	Q_1
Rice	40	50	10	12
Wheat	45	55	8	10
Oil	70	75	10	11
Fuel	80	90	12	15
Clothing	30	40	15	25

10. Explain in detail the process of setting up and testing a hypothesis. You are expected to explain with suitable illustrations all the involved concepts.

11. A common exam was taken by 3 students in four different cities.

Using the ANOVA test, decide whether there is a significant difference in the academic performance of the students in different cities.

Cities/Students	Marks of Student A	Marks of Student B	Marks of Student C
City One	60	70	45
City Two	70	65	55
City Three	75	55	65
City Four		90	75

You may use a 5 per cent level of significance.

SECTION – C

Compulsory case study. (1x15=15)

12. For the data given herein, you are required to :

a) Find the coefficient of correlation

b) Find the probable error and comment on the significance of correlation.

c) Find the regression equations.

d) Find Y when X = 50 and find X when Y = 45.

X	40	56	60	80
Y	42	58	67	73	90

PG – 915

I Semester M.B.A. Degree Examination, February 2017
(CBCS)
Management
Paper – 1.4 : STATISTICS FOR MANAGEMENT

Time : 3 Hours Max. Marks : 70

Instruction : *Statistical tables and calculators are* ***allowed.***

SECTION – A

Answer **any five** questions. **Each** question carries **five** marks. **(5×5=25)**

1. Explain the role of statistics in managerial decision-making. Illustrate with examples.

2. A bowler's scores for six games were 182, 168, 184, 190, 170 and 174. Using these data as a sample, compute the following descriptive statistics.

   a) Standard Deviation

   b) Variance

   c) Coefficient of variation.

3. What is Sampling ? Explain the different methods of sampling.

4. Five students P, Q, R, S and T are given a problem to solve. The probabilities are $\frac{1}{3}, \frac{1}{5}, \frac{1}{6}, \frac{1}{8}$ and $\frac{1}{9}$ of solving the problem. What is the probability that the problem will be solved ?

5. The mean circumference of 1500 shafts manufactured in a company is 15 cm and the deviation from the mean is 3 cm. Assuming normal distribution find out how many shafts have a circumference

   a) greater than 13 cm

   b) lesser than 19 cm.

P.T.O.

6. From the following data, find the straight line trend and forecast the production figures for the next two years of a certain company. A graph is not necessary.

Year	2007	2008	2009	2010	2011	2012	2013	2014
Production ('000 kgs)	64	70	82	69	75	88	90	94

7. Using the chi square test, determine whether a new drug discovered for preventing poultry disease is successful or not, based on the data given below : You may use a 5% degree of significance.

	Got disease	Did not get disease
Administered the drug	175	810
Did not administer the drug	215	620

SECTION – B

Answer **any three** questions. **Each** question carries **ten** marks. **(3×10=30)**

8. Construct Laspeyre's, Paache's and Fischer's ideal index for the following data and prove that ideal index satisfies the time reversal and factor reversal tests for the data below :

Commodity	2015		2016	
	Price	Quantity	Price	Quantity
A	3	9	5	8
B	6	12	7	9
C	4	14	5	10
D	2	18	3	15

9. A study was carried out on the advertising methods of a brand of product. The unit sales achieved by five stores were recorded as under.

	Store – A	Store – B	Store – C	Store – D	Store – E
Method I	78	85	82	88	79
Method II	81	92	77	83	81
Method III	79	83	71	78	80

Calculate the F-ratio, using ANOVA and 15% level of significance. Establish there is a significant difference between the sales in the different stores.

10. Explain the following concepts briefly with suitable diagrams :
    a) One tailed and two tailed tests
    b) Type I and Type II errors
    c) Skewness
    d) Kurtosis.

11. Find the coefficient of correlation and the probable error for the following data.

X	12	24	30	45	56	70	83
Y	29	31	44	56	72	88	90

Comment on the significance of the correlation.

SECTION – C

12. Case study (**compulsory**) : **(1×15=15)**

Anil has 2 investment options, but he can take up only one option at a time.

Option one : He can start a restaurant for an investment of Rs. 8,00,000. The outcome will be success (probability of 90%) with a cash inflow of Rs. 10,00,000. If he fails he incurs a loss of Rs. 2,00,000. If he succeeds he can decide to open a fast food joint for Rs. 6,00,000. The outcome would be success (probability 70%) with a cash inflow of Rs. 8,00,000. Failure means he can still salvage Rs. 3,00,000.

Option two : He can start a readymade dress showroom for Rs. 8,00,000. The outcome will be success (probability 80%) with a cash inflow of Rs. 11,00,000. Failure means he can still salvage Rs. 5,00,000. Draw a decision tree and a pay off table. Advise Anil on the most profitable option to undertake.

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PG – 1079

I Semester M.B.A. Degree Examination, February 2016
(CBCS) (2014-15 & Onwards)
Management
Paper – 1.4 : STATISTICS FOR MANAGEMENT

Time : 3 Hours

Max. Marks : 70

Instruction : *Calculators and tables are allowed.*

SECTION – A

Answer **any five** questions. **Each** question carries **five** marks. **(5x5=25)**

1. In the frequency distribution of 100 families given below, the median is known to be 50. Find the missing frequencies.

Expenditure	No. of families
0 – 20	14
20 – 40	–
40 – 60	27
60 – 80	–
80 – 100	15
Total	**100**

2. An analysis of the monthly wages paid to workers in two firms A and B belonging to the same industry that gave the following results.

	A	B
Number of wage earners	586	648
Average monthly wage	52.50	47.50
Variance of the distribution	100	121

a) Which firm pays the larger amount as monthly wages ?

b) In which firm you find greater variability in individual wages ?

P.T.O.

3. What is Correlation Analysis ? List and explain its types and uses.

4. Following data are available in respect of sales and advertisement expenditure.

	Sales	Advertisement Expenditure
Mean	70,000	15,000
Standard Deviation	15,000	3,000

Coefficient of correlation is + 0.8

Find the regression equations.

5. Explain Decision Theory along with its advantages and limitations.

6. Two sample polls of votes for two candidates A and B for a public office are taken, one from among residents of rural area and one from urban areas. The results are given below. Examine, whether the nature of the area is related to the voting preference in this election.

Votes for / Area	A	B	Total
Rural	620	380	1000
Urban	550	450	1000
Total	1170	830	2000

7. Explain Bayes theorem and its applications.

SECTION – B

Answer **any three** of the following questions. Each question carries **ten** marks. **(3×10=30)**

8. Explain different methods of sampling with examples.

9. Compute Laspeyres, Paasche's and Fisher's price index number for 2015, using the following data concerning three commodities :

	2014		2015	
Commodity	**Price (Rs.)**	**Quantity (Kg)**	**Price (Rs.)**	**Quantity (Kg)**
A	15	15	22	12
B	20	5	27	4
C	4	10	7	5

Also show that it satisfies both Time Reversal Test and Factor Reversal Test.

10. A company appoints four salesmen, A, B, C, D and observes their sales in three seasons – summer, winter and monsoon. The figures (in lakhs) are given in the following table :

	Salesman				
Season	**A**	**B**	**C**	**D**	**Total**
Summer	36	36	21	35	128
Winter	28	29	31	32	120
Monsoon	26	28	29	29	112
Total	90	93	81	96	360

Carry out an analysis of variance.

11. In Bangalore, 400 persons were considered regular consumers of pizzas out of a sample of 1000 persons. In Mangalore, 350 were regular consumers of pizzas out of sample of 800 persons. Test at 1% level of significance, whether there is a significant difference between the two towns as far as the proportion of pizza-eating habits are concerned.

SECTION – C

Compulsory.

(1×15=15)

12. A dietician wants to test 3 different types of diet plans to see if all these plans have similar weight reducing effects or not. He selected a homogenous group of 23 persons and placed them into 3 sub-groups, each sub-group trying a different diet plan. Each plan was tried for a period of 30 days.

The following observations of weight losses in kgs were recorded for members of each group after this period of 30 days.

Diet Plan 1	Diet Plan 2	Diet Plan 3
4.0	3.6	6.5
3.8	5.2	7.2
3.7	2.8	5.9
6.2	3.0	5.5
5.8	3.8	6.8
4.2	5.0	7.7
	3.9	8.0
	5.5	8.2
		7.0

PG – 851

I Semester M.B.A. Degree Examination, January/February 2015
(CBCS) (2014 – 15 & Onwards)
Paper – 1.4 : STATISTICS FOR MANAGEMENT

Time : 3 Hours Max. Marks : 70

Instruction : *Statistical tables and calculators are* ***allowed.***

SECTION – A

Answer **any five** of the following questions. **Each** question carries **five** marks. Answers to theoretical questions should **not** exceed **250** marks. **(5×5=25)**

1. What is sampling ? Discuss different sampling techniques and their relevance in statistical inference.

2. The data given below pertains to the patients admitted into a corporate Hospital during the years 2007 and 2013. Fit a straight line trend by the method of least squares and estimate the number of patients for the years 2014 and 2015. A graph is not necessary

Years	2007	2008	2009	2010	2011	2012	2013
Patients in lakhs	19	21	25	29	26	27	32

3. Define the following concepts :

   a) Null hypothesis and alternative hypothesis.

   b) One Tailed and Two Tailed tests.

   c) Point estimation and internal estimation.

   d) Type I and Type II errors.

   e) Confidence limits.

P.T.O.

4. A survey of 500 students yielded the data given below : Using Chi-square analysis and assuming a 5 % significance level, find whether mentoring has an impact on the performance index.

Performance Index	Mentoring done	No mentoring	Total
Very high	200	50	250
Average	150	50	200
Very low	25	25	50
	375	125	500

5. Illustrate and explain the concept of Kurtosis with suitable diagrams. Also illustrate and explain the concept of skewness and state the formulae for the absolute and relative measures of skewness.

6. A company wants to select a team leader from among the following candidates :

   a) Male, age 40

   b) Male, age 43

   c) Female, age 38

   d) Female, age 29

   e) Male, age 39

   What is the probability that the team leader selected, will be

   1) Either male or aged above 41 years ?

   2) Either female or aged below 35 years.

7. What are non parametric tests ? Discuss with suitable examples the different non parametric tests and state their relevance.

11. The weekly wages of 2000 workers are normally distributed. Its Mean and Standard Deviation are Rs. 140 and Rs. 20 respectively. Estimate the number of workers whose weekly wages will be

    a) Between Rs. 120 and Rs. 130

    b) More than Rs. 170

    c) Less than Rs. 165

    d) Between Rs. 135 and Rs. 145

    e) Between Rs. 138 and Rs. 150.

SECTION – C

This is a **compulsory** Section. **(1×15=15)**

12. In a class of 10 students the marks scored in the subjects of Sociology and Mathematics are listed as below. From the data find

    a) The two regression coefficients

    b) The two regression equations

    c) The most likely marks in Statistics when marks in Economics are 80

    d) The most likely marks in Economics when marks in Statistics are 60

    e) Also find the Correlation Coefficient between them :

Marks in Sociology	85	77	65	51	82	48	91	42	72	58
Marks in Mathematics	77	81	55	62	66	65	88	49	69	70