

Code: 21E00105

MBA I Semester Regular & Supplementary Examinations January 2025
STATISTICS FOR MANAGERS
(Common to MBA, Finance, Finance, BDA, Big DA, B&FS and HC&HM)

Time: 3 hours

Max. Marks: 60

All questions carry equal marks
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SECTION - A

(Answer the following: 05 X 10 = 50 Marks)

- 1 (a) What are measures of central tendency? What are their advantages and limitations? 5M
 (b) The following data represents the survey regarding the heights (in m) of 51 girls of Class x. Find the median height. 5M

Height (in cm)	Number of Girls
Less than 140	4
Less than 145	11
Less than 150	29
Less than 155	40
Less than 160	46
Less than 165	51

OR

- 2 (a) Discuss the significance of statistics in business management. 5M
 (b) Find standard deviation for the following data: 5M

Items	0-10	10-20	20-30	30-40
Frequency	2	1	1	3

- 3 (a) Explain the measures of correlation. List the limitation of correlation. 5M
 (b) Define correlation coefficient? Calculate the correlation co-efficient of the following: 5M

X	Y
1	2
3	5
4	5
4	8

OR

- 4 A researcher has found that there is a correlation between the weight tendencies of father and son. He is now interested in developing regression equation on two variables from the given data: 10M

Weight of father (in Kg)	69	63	66	64	67	64	70	66	68	67	65	71
Weight of Son (in Kg)	70	65	68	65	69	66	68	65	71	67	64	72

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- 5 (a) What is marginal and joint probability? Explain about Bayes' theorem. 5M
 (b) In a group of 100 computer buyers, 40 bought CPU, 30 purchased monitor, and 20 purchased CPU and monitors. If a computer buyer chose at random and bought a CPU, what is the probability they also bought a Monitor? 5M

OR

- 6 (a) Define poisson distribution. State its properties and applications. 5M
 (b) If 3% of electronic units manufactured by a company are defective. Find the probability that in a sample of 200 units, less than 2 bulbs are defective. 5M

- 7 (a) What is the importance of Z-test? How to conduct Z test for proportions? 5M
 (b) A teacher claims that the mean score of students in his class is greater than 82 with a standard deviation of 20. If a sample of 81 students was selected with a mean score of 90 then check if there is enough evidence to support this claim at a 0.05 significance level. 5M

OR

- 8 (a) Explain types of t-tests. How to conduct t-test for independent samples? 5M
 (b) The marks of boys and girls are given: 5M

Boys: 12, 14, 10, 8, 16, 5, 3, 9, and 11

Girls: 21, 18, 14, 20, 11, 19, 8, 12, 13, and 15

Is there any significant difference between marks of males and females i.e. population means are different.

- 9 (a) Explain different parametric and non-parametric methods used in testing hypotheses. 5M
 (b) Explain the concept of ANOVA test? List limitations of one-way ANOVA test? 5M

OR

- 10 (a) State the guidelines for performing a paired-sample sign test. 5M
 (b) A psychologist claims that the number of repeat offenders will decrease if first time offenders complete a particular rehabilitation course. You randomly select 10 prisons and record the number of repeat offenders during a two-year period. Then, after first-time offenders complete the course, you record the number of repeat offenders at each prison for another two-year period. The results are shown in the following table. At 0.05 significance level, can you support the psychologist's claim? 5M

Prison	1	2	3	4	5	6	7	8	9	10
Before	21	34	9	45	30	34	37	36	33	40
After	19	22	16	31	21	20	22	18	17	21

SECTION - B

(Compulsory question 01 X 10 = 10 Marks)

- 11 A psychologist wishes to test if preference of method of learning differs with gender. He asks a group of 146 individuals their preferred method of learning. Below is a table of the results. Perform a Chi-Square test to see if a relationship exists. 10M

	Male	Female	Total
Visual	23	17	40
Auditory	13	35	48
Kinaesthetic	30	28	58
Total	66	80	146

MBA I Semester Supplementary Examinations October 2022
STATISTICS FOR MANAGERS

(Common to all) For Students admitted in 2021 only

Time: 3 hours

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SECTION-A

(Answer the following: 05 X 10 = 50 Marks)

1. (a) List out any three differences between mean, median and mode. 5M
(b) Calculate the average bonus paid per member from the following data: 5M

Bonus(in Rs)	50	60	70	80	90	100	110
No. of workers	1	3	5	7	6	2	1

OR

2. What is meant by dispersion? In your opinion which is the best of finding out dispersion and why? 10M
3. (a) What is rank correlation? What are its merits? 5M
(b) Distinguish between correlation and regression. 5M

OR

4. The following data relate to the age of 10 employees and the number of days which they reported sick in a month. 10M

Age	20	30	32	35	40	46	52	55	58	62
Sick days	11	12	10	13	14	16	15	17	18	19

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

5. (a) Explain the Bayes' Theorem. 5M
(b) A bag contains 5 white and 4 black balls. Two balls are drawn at random one after the other without replacement. Find out the probability that both balls drawn are black 5M

OR

6. The Human Resource department of a company has records which show the following analysis of its 200 engineers: 10M

Age	Bachelor's degree	Master's degree	Total
Under 30	90	10	100
* 30-40	20	30	50
Over 40	40	10	50

If one engineer is selected at random from the company, find

- (i) The probability he has only a bachelor's degree.
(ii) The probability he has a master's degree, given that he is over 40.
(iii) The probability he is under 30, given that he has only a bachelor's degree.
7. Two types of drugs were used on 5 and 7 patients for reducing their weight. Drug A was imported and drug B was indigenous. The decrease in the weight after using the drugs for six months was as follows: 10M

Drug A	10	12	13	11	14		
Drug B	8	9	12	14	15	10	9

Is there a significant difference in the efficacy of the two drugs? if not, which drug should you buy?($v = 10, 10.05 - 2.223$)

OR

8. Two random samples were drawn from the two normal populations and their values are: 10M

A	66	67	75	76	82	84	88	90	92		
B	64	66	74	78	82	85	87	92	93	95	97

Test whether the two populations have the same variance at the 5% level of significance ($F=3.36$) at 5% level for $v_1 = 10$ and $v_2 = 8$.

9. Of the 1,000 workers in a factory exposed to an epidemic, 700 in all were attacked, 400 had been inoculated and of these, 200 were attacked. On the basis of this information, can it be said that inoculation and attack are independent? 10M

	Inoculated	Not inoculated	Total
Attacked	200	500	700
Not attacked	200	100	300
Total	400	600	1,000

On the basis of this information, can it be said that inoculation and attack are independent? Carry out the chi-square test as per testing procedure at 5% level.

OR

10. Use the sign test to see if there is any difference between the number of days until 10M collection of an account receivable before and after a new collection policy. Use the 0.05 significance level 10M
- Before: 30 28 34 35 40 42 33 38 34 45 28 27 25 41 36
- After: 32 29 33 32 37 43 40 41 37 44 27 33 30 38 38

SECTION-B
(Compulsory question, 01 X 10 10 Marks)

11. **Case Study/Problem:**

10M

A test was given to 5 students chosen at random from the MBA class of each of the three universities in Andhra Pradesh. Their scores were found to be as follows:

University	Scores				
A	90	70	60	50	80
B	70	40	50	40	50
C	60	50	60	70	60

Carry out Analysis of Variance and show if there is any significant difference between the scores of students in the three universities (Given $F_{5\%} = 3.44$).

STATISTICS FOR MANAGERS

(Common to MBA, Finance, Fintech, Business Data Analytics, Big Data Analytics, B&FS and H&HM)

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SECTION – A

(Answer the following: 05 X 10 = 50 Marks)

- 1 (a) Discuss the significance of statistics in business. 5M
 (b) What are the characteristics of an ideal average? 5M

OR

- 2 100 executives working in MNC were contacted to know their annual salary (Rs. In lakhs). 10M
 When summarised the raw data resulted in the distribution given below:

Annual salary	2 - 6	6 - 10	10 - 14	14 - 18	18 - 22	22 - 26	26 - 30
No. of executives	10	15	30	18	12	09	06

You are required to find the;

- (i) Median,
 (ii) Mode.

- 3 Explain the following: 10M
 (i) Utility of regression analysis,
 (ii) Types of correlation.

OR

- 4 For 10 observations on price (X) and supply (Y), the following data were obtained: 10M
 $\Sigma X = 130$, $\Sigma Y = 220$, $\Sigma XY = 3467$, $\Sigma X^2 = 2288$, $\Sigma Y^2 = 5506$.
 (i) Obtain the regression line of X on Y,
 (ii) Obtain the regression line of Y on X.

- 5 (a) What is Poisson distribution? State its conditions. 5M
 (b) What are the properties of normal curve? 5M

OR

- 6 (a) Explain the multiplication theory of probability. 5M
 (b) If 3 coins were tossed. Find the probability of getting 2 heads. 5M

- 7 (a) The average daily food expenses of person was Rs.200 with a standard deviation of Rs.15 in a sample of 81 people in a city. For another sample of 81 persons, the average daily food expenses was Rs.210 with a standard deviation of Rs.12. Test the significance between two means @ 1% level. 5M

- (b) What is ANOVA? What are its assumptions? 5M

OR

- 8 (a) What do you understand by type-I and type-II errors? 5M
 (b) Describe the procedure of testing paired t-test. 5M

- 9 (a) Distinguish between parametric and non-parametric tests. 5M
 (b) Explain the procedure of testing sign test for one sample data. 5M

OR

- 10 (a) What is contingency table? Illustrate with an example. 5M
 (b) The number of automobile accidents per week that took place during peak traffic hours in a city reported for 10 weeks were 12, 8, 20, 2, 14, 10, 15, 6, 9, 4. Are the frequencies in agreement with the belief that accident conditions were the same during this 10 week period? 5M

SECTION – B

(Compulsory question, 01 X 10 = 10 Marks)

11 Case Study/Problem:

Which one of the two distribution series given below is more consistent?

Class interval	10-20	20-30	30-40	40-50	50-60	60-70
Series-A	10	16	34	38	24	18
Series-B	18	22	38	34	20	08

MBA I Semester Supplementary Examinations July 2024
STATISTICS FOR MANAGERS
 (Common to all branches)

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SECTION – A

(Answer the following: 05 X 10 = 50 Marks)

- 1 (a) State the nature of statistics to business. 5M
 (b) Explain various measures of dispersion. 5M

OR

- 2 Given below is the distribution of marks obtained by 60 students. 10M

Marks	20	30	40	50	60	70
No. of students	08	12	20	10	06	04

You are required to compute;
 (i) Arithmetic mean, (ii) Mode.

- 3 (a) Distinguish between correlation and regression. 5M
 (b) What are the properties of regression co-efficient. 5M

OR

- 4 Write about the: 10M
 (i) Methods of measuring correlation.
 (ii) Working rule of rank correlation.

- 5 (a) What is the significance of probability in business applications? 5M
 (b) Explain the addition theory of probability. 5M

OR

- 6 (a) What are the characteristics of Binomial distribution. 5M
 (b) Find the probability of getting 2 diamonds, if you draw 2 cards at random from a pack of 52 cards. 5M

- 7 (a) The following table gives the biological value of protein from 6 cow's milk and 6 buffalo's milk. 5M

Cow's milk	1.8	2.0	1.9	1.6	1.8	1.5
Buffalo's milk	2.0	1.8	1.8	2.0	2.1	1.9

Examine whether the difference in milk are significant @ 5% level of significance.

- (b) What are the different types of hypotheses? 5M

OR

- 8 (a) In a sample of 400 parts manufactured by a factory, the number of defective parts was found to be 30. The company, however, claim that only 5% of their products are defective. Is the claim tenable? 5M
 (b) Describe the various steps in the computation of one-way ANOVA. 5M

- 9 (a) A sample of 300 students of B.Tech and 300 students of MBA classes of a University were asked to give their opinion toward the autonomous colleges. 190 of the B.Tech and 210 of the MBA students favored the autonomous status. Present this data in the form of a frequency table and test at 5% levels, the opinions of B.Tech and MBA students on autonomous status of colleges are independent. (Table value of χ^2 at 5% level for 1 d.f. is 3.84) 5M

- (b) Describe the procedure of testing sign for one sample data. 5M

OR

- 10 (a) Discuss the precautions to be kept in mind while using Chi-square test statistic. 5M
 (b) Distinguish between parametric and non-parametric tests. 5M

SECTION – B

(Compulsory question, 01 X 10 = 10 Marks)

- 11 **Case Study/Problem:** 10M

The following data relates to marketing expenditure (Rs. In lakhs) and the corresponding sales (Rs.in crores) of a product. Estimate the marketing expenditure to attain a sales target of Rs.40 cores.

Expenditure	10	12	15	20	23
Sales	14	17	23	21	25

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MBA I Semester Supplementary Examinations October 2020

STATISTICS FOR MANAGERS

(For students admitted in 2017, 2018 & 2019 only)

Time: 3 hours

Max. Marks: 60

All questions carry equal marks

SECTION – A

(Answer the following: 05 X 10 = 50 Marks)

- 1 (a) What are the uses of statistics in business decision making?
(b) Discuss the merits and demerits of range, quartile deviation and mean deviation.

OR

- 2 (a) What is meaning of standard deviation? Explain why standard deviation is the most preferred and widely used tool of measure of dispersion.
(b) An HR manager of a company finds that teenagers frequently change jobs. The dissatisfaction with their present jobs is a major factor in the decision they make. Thus, she selects a sample of interviews of 15 teenagers from the past six months. She records the number of months the teenagers spent on their previous jobs:

12 5 1 6 20 24 16 7 11 8 23 19 25 14 4

- (i) Calculate the range of months that the teenagers spent on their jobs.
(ii) Calculate the median months that each spent at their previous job.
(iii) Calculate the interquartile range for the months each teenager spent at his or her previous job.

- 3 (a) What is 'correlation'? Explain positive and negative correlations.
(b) State the properties of regression coefficients.

OR

- 4 (a) Explain the concept of regression sum of squares (SSR) and error of squares (SSE) in a regression model.
(b) Consider the following set of data:

x	48	27	34	24	49	29	39	38	46	32
y	47	23	31	20	50	48	47	47	42	47

Calculate the correlation coefficient of these two variables.

- 5 (a) Explain the concept of normal distribution. Analyse why it is a widely used probability distribution.
(b) Define the mean, standard deviation and variance of an exponential distribution.

OR

- 6 (a) What is a Poisson distribution? State the main assumptions of a Poisson distribution.
(b) A consumer electronics company has 24 showrooms located across India. Out of these 24 showrooms, 12 are located in Gujarat. If five showrooms are selected at random from the entire list, what is the probability that one or more randomly selected showrooms are located in Gujarat?

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- 7 Discuss the procedure of testing hypothesis for difference between two sample means using t-test.

OR

- 8 Explain the different types of ANOVA. What are the steps involved in carrying out ANOVA?

- 9 (a) What is the difference between parametric tests and non-parametric tests?
(b) Discuss the procedure of conducting Chi-square test for independence of attributes.

OR

- 10 (a) Explain the assumptions and significance of sign test.
(b) The table below gives the scores obtained from a random sample of 8 customers before and after the demonstration of a product. Is there any evidence of difference in scores before and after demonstration?

Scores before product demonstration	Scores after product demonstration
30	28
32	40
31	44
34	30
30	41
32	42
34	43
31	29

SECTION - B

(Compulsory question, 01 X 10 = 10 Marks)

11

Case Study/Problem:

A company is concerned about the high rates of absenteeism among its employees. It organised a training programme to boost the morale of its employees. The following table gives the number of days that sixteen randomly selected employees have received training, and the number of days they have availed leave:

Employee	Training days	Leave
1	12	20
2	14	18
3	16	16
4	13	22
5	11	18
6	10	19
7	15	14
8	17	12
9	18	10
10	19	9
11	17	11
12	15	16
13	13	19
14	15	17
15	17	15
16	12	21

Questions:

- (i) Develop a regression model to predict leaves based on training days.
(ii) Calculate the coefficient of determination and interpret it.
(iii) Calculate the standard error of the estimate.
(iv) Predict the leaves when the training days are 25.

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MBA I Semester Supplementary Examinations October/November 2022
STATISTICS FOR MANAGERS

(Common to B&FS and MBA)
(For students admitted in 2018, 2019 & 2020 only)

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SECTION - A

(Answer the following: 05 X 10 = 50 Marks)

- 1 (a) Explain the measures of central tendency, with examples.
(b) What is harmonic mean?
- OR
- 2 (a) Discuss the application of measures of dispersion for business decision making.
(b) What is quartile deviation?
- 3 (a) List and explain the different types of correlation.
(b) Discuss the concept and significance of co-efficient of correlation.
- OR

- 4 Two business school Professors were discussing how difficult it is to predict the success of MBA graduates. One Professor thought that the number of years of Work experience MBAs had before joining the course was probably a better predictor, while other thought that Grades (Grade Point Average) alone are better predictor of career success. For this purpose the data relating to 10 pass out MBA students were used. Using the data below, at the 0.02 level of significance, Which Rank Correlation is a better predictor of success?

(Student No.)	Work Experience (yrs.)	Grade Point Avg.	Success Rank
1	4	3.4	4
2	3	3.2	2
3	4	3.5	6
4	3	3.0	5
5	6	2.9	7
6	7	3.4	9
7	1	2.5	1
8	5	3.9	8
9	5	3.6	10
10	2	3.0	3

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- 5 (a) Define the term 'Probability' with suitable examples.
(b) Explain the significance of probability in business application.
- OR
- 6 (a) What is Probability distribution?
(b) Distinguish between Binomial probability distribution vs. Poisson distribution, with examples.
- 7 State the concept of ANOVA and discuss the methodology and significance of ANOVA, using a suitable numerical illustration.
- OR
- 8 (a) What is a null hypothesis and what is alternate hypothesis?
(b) Distinguish between parametric test and non-parametric tests in hypothesis testing. Give suitable examples.
- 9 Explain the concept and formula used for calculation of chi-square test for single sample standard deviation.
- OR
- 10 (a) What is a sign test?
(b) Using a suitable numerical example, illustrate the calculation and significance of sign test for paired data.

SECTION - B

(Compulsory question, 01 X 10 = 10 Marks)

Case Study/Problem:

The following data shows annual hours missed due to illness for the 30 men and women at XYZ Inc. Using Mann-Whitney U Test, find out whether there is any difference attributable to gender at the 0.10 level of significance.

{ Z-value for area under normal curve of 0.45 is 1.645 }

Men	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Missed Hours	31	44	25	30	70	63	54	42	36	22	25	50	44	41	58

Women	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Missed Hours	38	34	33	47	59	83	18	36	41	37	24	48	25	30	29