

St. Clare College

Autonomous, Bengaluru

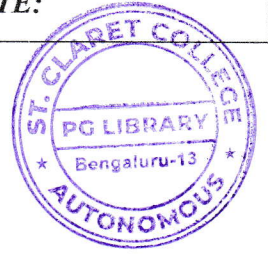
PG END SEMESTER EXAMINATION-APRIL 2026

MBA FIRST SEMESTER

MBA 1424: STATISTICS FOR MANAGEMENT

ROLL NO:

DATE:



TIME: 3 hours.

MAX. MARKS: 70

This paper contains THREE printed pages and FOUR parts

Instructions:

1. Verify and ensure that the question paper is completely printed.
2. Any discrepancies or questions about the exam paper must be reported to the COE within 1 hour after the examination.
3. Students must check the course title and course code before answering the questions.

PART-A

Answer SEVEN questions out of NINE. Each answer carries TWO marks.

[2x7 = 14]

1. Discuss the difference between statistics as numerical facts and statistics as a discipline or field of study.
2. Explain and differentiate Type I and Type II errors in hypothesis testing using appropriate examples.
3. In a production batch of 1000 items, 10% are defective. If 5 items are selected at random, what is the probability that none of them is defective?
4. Briefly explain the three theories of probability distribution.
5. Explain the concept of the chi-square goodness-of-fit test.
6. Define the concept of Expected Monetary Value (EMV) in decision theory.
7. In a company, the monthly income (in thousands) of 6 employees is: 40, 42, 45, 50, 55, 60. Calculate the coefficient of variation.
8. Classify the following variables as categorical or quantitative: Age, Gender, Income, Education Level.
9. What is the sampling distribution for the mean and proportion?

PART-B

Answer any FOUR questions out of SIX. Each answer carries FIVE marks.

[5x4=20]

10. The Tourism Board of Paris collects data on tourists visiting the city. The following questions were among 15 asked in a survey handed out to visitors at a popular tourist attraction.
 - The visit to Paris is my : 1st, 2nd, 3rd, 4th ...etc
 - The primary purpose of this visit is : (10 categories, including vacation, business, education)
 - Mode of Accommodation: (Hotels, Hostels, Airbnb, Staying with friends/family)

- Total amount spent during the trip(in Euros)
 - a) Is conducting a survey at tourist attractions a good way to collect data from the population? Why or why not?
 - b) Which sampling technique would be the best in this situation?

11. Find Karl Pearson's correlation coefficient between age and the playing habits of the following students :

<i>Age (years)</i>	15	16	17	18	19	20
<i>Regular players</i>	200	150	90	48	30	12
<i>No. of students</i>	250	200	150	120	100	80

Also, calculate the probable error and point out if there is any correlation between age and the rate of regular players.

12. The mean and variance of a binomial distribution are 3 and 4 respectively. Find the probability that the variate takes the values :(i) Less than or equal to 2, (ii) greater than or equal to 7.

13. Fit a straight-line trend to the following data and estimate the value of output for the years 2007 and 2008.

<i>Year</i>	1997	1998	1999	2000	2001	2002	2003
<i>Production of steel (in million tons)</i>	60	72	75	65	80	85	95

14. What is sampling? What are the essentials of a good sample? Name the various methods of sampling and explain them in brief.

15. A marketing company wants to analyze whether gender has any influence on brand preference. A survey of 100 respondents was conducted, and the following data was recorded:

Perform a Chi-Square Test for Independence at a 5% significance level.

<i>Brand Preference</i>	<i>Male</i>	<i>Female</i>
<i>Brand A</i>	20	30
<i>Brand B</i>	25	15
<i>Brand C</i>	5	5

PART-C

Answer any TWO questions out of THREE. Each answer carries TEN marks.

[10X2=20]

16. A company wants to study the relationship between hours of employee training (X) and employee productivity (Y) measured in units produced per day. The following data was collected for 8 employees:

<i>Hours of Training (X)</i>	2	4	6	8	10	12	14	16
<i>Productivity (Units Produced) (Y)</i>	20	25	30	36	40	45	50	55

- a) Fit the regression equation using the Least Squares Method.
- b) Predict the expected productivity if an employee undergoes 9 hours of training.

17. The mean *I.Q.* (intelligence quotient) of a large number of adolescents was 100, and the standard deviation is 16. Assuming that the distribution was normal, find

- (i) What % of the children had *I.Q.* under 80?
- (ii) How many children have *I.Q.s* between 70 to 90?
- (iii) What % of the children had *I.Q.s* greater than 95?
- (iv) How many children have *I.Q.s* at most 85?
- (v) What % of the children had *I.Q.s* at least 75?

18. Eleven school boys were given a test in Statistics. They were given a month's tuition, and a second test was held at the end of it. Do the marks give evidence that the students have shown better performance after tuitions?

<i>Boys</i>	1	2	3	4	5	6	7	8	9	10	11
<i>Marks in 1st test</i>	23	20	19	21	18	20	18	17	23	16	19
<i>Marks in 2nd test</i>	24	19	22	18	20	22	20	20	23	20	18

19. Priya is considering two business ventures, but she can only invest in one at a time.

Venture One:

She can open a speciality coffee shop for an investment of ₹8,00,000. The outcome will be a success (probability 90%) with a cash inflow of ₹10,00,000. If it fails, she incurs a loss of ₹2,00,000. If successful, she can then decide to open a bakery next door for an additional ₹6,00,000. The bakery would be a success (probability 70%) with a cash inflow of ₹8,00,000. If the bakery fails, she can salvage ₹3,00,000.

Venture Two:

She can start a boutique clothing store for ₹8,00,000. The outcome will be a success (probability 80%) with a cash inflow of ₹11,00,000. If it fails, she can salvage ₹5,00,000.

Draw a decision tree and advise Priya on the most profitable option to undertake.

PART-D

Answer the following.

[16X1=16]

20. A manufacturing company wants to evaluate whether there is a significant difference in the average productivity (units produced per hour) of employees working in three different shifts — Morning, Afternoon, and Night. However, the Night Shift supervisor claims that the lower productivity is due to machine breakdowns, not employee performance. The management wants to verify if the difference in productivity is truly significant, regardless of this claim. The data collected from 5 employees randomly selected from each shift is shown below:

<i>Morning Shift</i>	<i>Afternoon Shift</i>	<i>Night Shift</i>
50	55	48
52	53	50
51	54	52
53	52	49
54	51	51

Perform an analysis of variance test at a 5% significance level to determine whether there is a significant difference in the mean productivity across the three shifts.
