Bachelor of Commerce (General)

B.ComG

CHOICE BASED CREDIT SYSTEM

BCOC – 134: BUSINESS MATHEMATICS AND STATISTICS

ASSIGNMENT

2026

Valid from 1st January 2026 to 31st December 2026

Second Semester

School of Management Studies

Indira Gandhi National Open University

Maidan Garhi, New Delhi -110068

BACHELOR OF COMMERCE (GENERAL)
CHOICE BASED CREDIT SYSTEM
BCOC – 134: BUSINESS MATHEMATICS AND STATISTICS

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Dear Students,

As explained in the Programme Guide, you have to do one Tutor Marked Assignment in this Course. The assignment has been divided into three sections. Section A Consists of five questions for 10 marks each, Section B consists five questions for 6 marks each and Section C consists of two questions for 10 marks each.

Assignment is given 30% weightage in the final assessment. To be eligible to appear in the Term-end examination, it is compulsory for you to submit the assignment as per the schedule. Before attempting the assignments, you should carefully read the instructions given in the Programme Guide.

1. Those students who are appearing in June 2026 Term End Examination they have to submit latest by in 15 March 2026.
2. Those students who are appearing in December 2026 exams. They should download the new assignment and submit the same latest by 15 October 2026.

You have to submit the assignment of all the courses to the Coordinator of your Study Centre.

TUTOR MARKED ASSIGNMENT

COURSE CODE	**:**	**BCOC – 134**
COURSE TITLE	**:**	**BUSINESS MATHEMATICS AND STATISTICS**
ASSIGNMENT CODE	**:**	**BCOC – 134/TMA/2026**
COVERAGE	**:**	**ALL BLOCKS**

Maximum Marks: 100

Note: Attempt all the questions.

Section – A

Q. 1 A firm producing packaged snacks operates in a competitive urban market. The estimated monthly demand function for its product is **(10)**

$$Q = 1{,}200 - 20P$$

where Q is quantity demanded and P is price per packet (in ₹). The total cost function of the firm is

$$C = 4{,}000 + 10Q + 0.05Q^2$$

a) Derive the total revenue and profit of the firm.
b) Using calculus, determine the level of output that maximizes profit.
c) Find the corresponding price and maximum profit.
d) Interpret the results for managerial decision-making.

Q. 2 **(10)**

The monthly sales (in ₹ lakh) of a regional retail chain across eight outlets are as follows:

Outlet	A	B	C	D	E	F	G	H
Sales	24	28	20	30	26	22	40	10

a) Calculate the mean and median sales.
b) Compute the standard deviation.
c) Comment on the consistency of sales performance across outlets.
d) Suggest one managerial implication based on the dispersion observed.

Q. 3 A manufacturing firm plans to replace old machinery after five years. It deposits ₹5,00,000 today in a fixed-income instrument offering 9% per annum compounded annually. **(10)**

a) Calculate the amount accumulated after five years.
b) If the firm alternatively considers a simple interest investment at 10% per annum for the same period, compute the maturity value.
c) Compare the two options and justify which is financially preferable.
d) Explain the relevance of compounding for long-term business planning.

Q. 4 **(10)**

A marketing manager wants to study the relationship between advertising expenditure (₹ lakh) and sales revenue (₹ lakh) of a product. The following data are collected:

Advertising (X)	2	4	6	8	10
Sales (Y)	20	25	29	34	40

a) Estimate the regression equation of sales on advertising.
b) Interpret the slope of the regression line estimated above.
c) Estimate expected sales when advertising expenditure is ₹7 lakh.
d) Explain how this regression result can assist managerial decisions.

Q. 5 A firm produces three products using two raw materials. The input requirement (in units) per **(10)**

unit of output is given below:

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 4 & 1 & 2 \end{bmatrix}$$

If the firm plans to produce 100 units of product 1, 80 units of product 2, and 60 units of product 3:

a) Express the production plan as a column matrix.
b) Determine the total requirement of each raw material using matrix multiplication.
c) Interpret the results for procurement planning.
d) State two advantages of using matrices in business analysis.

Section – B

Q. 6 Explain the role of statistics in modern business decision-making. Illustrate your answer with suitable examples from marketing, production, or finance departments in a firm. **(6)**

Q. 7 A firm's average cost function is given by **(6)**

$$AC = 50 + 0.4Q + \frac{200}{Q}$$

a) Find the output level at which average cost is minimum.
b) Explain the economic significance of this point for the firm.

Q. 8 A company employs workers in three departments with the following average monthly wages: **(6)**

Department	No. of Workers	Average Wage (₹)
Production	50	18,000
Sales	30	22,000
Administration	20	25,000

Calculate the overall average monthly wage of the company using the weighted average method and interpret the result.

Q. 9 The marginal revenue function of a firm is: **(6)**

$$MR = 100 - 4Q$$

a) Derive the total revenue function assuming revenue is zero when output is zero.
b) Determine the level of output at which total revenue is maximum.
c) State one managerial implication of your result.

Q.10 Define correlation. Using a suitable business example, explain the difference between positive correlation and negative correlation. **(6)**

Section – C

Q.11 Write short notes on the following: **(5×2)**

a) Contribution margin and its business relevance
b) Break-even analysis

Q.12 Distinguish between the following: **(5×2)**

a) Simple index numbers and Weighted index numbers
b) Absolute Measure of Dispersion and Relative Measure of Dispersion