



2026

(FYUGP 2nd Semester)

COMMERCE

(Interdisciplinary Paper)

Paper Code: IDP-2/BM (BASIC MATHEMATICS)

TIME: 2 Hours

(PART: A-OBJECTIVE)

(Marks: 12.5)

The figures in the margin indicate full marks for the questions

A. 1. Choose the correct answer of the following: $0.5 \times 15 = 7.5$

1. In a square matrix A the number of

- a) rows = columns
- b) rows $\leq$ columns
- c) rows $>$ columns
- d) None of the above

2. A square matrix A is said to be non-singular if

- a) $|A| = 0$
- b) $|A| \neq 0$
- c) $|A| = 1$
- d) None of the above

3. Which of the following is correct

- a) Determinant is a square matrix
- b) Determinant is a number associated to a matrix
- c) Determinant is a number associated to a square matrix
- d) None of these

4. Which of the following is correct

- a) Every scalar matrix is an identity matrix
- b) Every identity matrix is a scalar matrix
- c) Every diagonal matrix is an identity matrix
- d) Every square matrix is an identity matrix

5. If A and B are two matrices then AB or AxB is possible if

- a) A and B can be any matrices

- b) A and B are square matrices not necessarily of same order
- c) Number of rows in B is equal to the Number of columns in A
- d) A and B are not square matrices.

6. The derivative of a constant value is always:

- a) 1
- b) The constant itself
- c) 0
- d) Infinity

7. The first derivative of the Total Revenue function (TR) with respect to quantity (Q) is known as:

- a) Marginal Cost
- b) Total Profit
- c) Marginal Revenue
- d) Average Revenue

8. The Lagrangian Multiplier method is specifically used to find maxima or minima in cases of:

- a) Implicit functions only
- b) Unconstrained optimization
- c) Constrained optimization
- d) Integration by parts

9. If the Marginal Cost (MC) function is given, Total Cost (TC) is found by:

- a) Differentiating MC
- b) Integrating MC
- c) Multiplying MC by Quantity
- d) Dividing MC by Quantity

10. The area under the demand curve and above the price line is known as:

- a) Producer's Surplus
- b) Total Profit
- c) Consumer's Surplus
- d) Marginal Cost

11. Which type of annuity has payments made at the end of each period?

- a) Annuity Due

- b) Ordinary Annuity
- c) Deferred Annuity
- d) Perpetual Annuity

12. Compounding refers to finding the-

- a) Present Value
- b) Future Value
- c) Discount Rate
- d) Depreciation amount

13. An annuity that continues forever is called a-

- a) Continuous Annuity
- b) Perpetual Annuity (Perpetuity)
- c) Fixed Annuity
- d) Life Annuity

14. In an Annuity Due, payments are made at the-

- a) End of the period
- b) Middle of the period
- c) Beginning of the period
- d) Every two years

15. A "Deferred Annuity" is one where payments-

- a) Start immediately
- b) Start after a certain lapse of time
- c) Never end
- d) Are made in a single lump sum

A. 2. Write short notes on the following: 1x5=5

- a) Identity/Unit matrix or Null matrix
- b) Transpose of a matrix or Rank of a matrix
- c) Differentiation or Integration
- d) Consumer surplus or Producer surplus
- e) Ordinary annuity or Annuity due

(PART: B - DESCRIPTIVE)
(MARKS: 25)

The figures in the margin indicate full marks for the question

1. (a) What are the different types of matrices? Explain.

Or

(b) What are the properties of determinants? Give example.

2. (a) Solve the following simultaneous equations: 5

$$2x - y + 3z = 9$$

$$x + 3y + 2z = 13$$

$$2x + 2y + z = 9$$

Or

- (b) Find the inverse of the following matrix:

$$A = \begin{bmatrix} 2 & 3 & -1 \\ 0 & 4 & 2 \\ 3 & 2 & 2 \end{bmatrix}$$

3. (a) Find the derivative of the following function: 2+3

a) $Y = 5x^3 - 3x^2 + 2x + 10$

b) $Y = (10 - x^4)(5x + x^2)$

Or

- (b) Find the extreme value of the following function: 5

$$Y = \frac{1}{3}x^3 - 3x^2 + 5x + 3$$

4. (a) If consumer's demand function is given by 5

$$Q_d = f(P) = \sqrt{60 - 2P}$$

Find consumer's surplus when market price $P = 12$.

Or

- (b) Obtain the producer's surplus given the supply function and price-

$$Q_s = f(P) = -5 + \frac{4}{5}P \text{ when price } P = 15$$

5. (a) What is annuity? What are its types? Explain. 5

Or

- (b) Find the amount of an annuity consisting of payments of Rs. 800 at the end of every 3 months for 3 years at the rate of 8% compounded quarterly.

xxx