

Seat No. : \_\_\_\_\_

**MK-217**

**May-2025**

**B.B.A, Sem.-II**

**MDC-BMT-124 : Advance Business Mathematics**

**Time : 2:00 Hours]**

**[Max. Marks : 50**

- Instructions :**
- (i) All questions are compulsory.
  - (ii) Each question carries equal marks.
  - (iii) Use of simple calculator is allowed.

1. (A) Find the equation of a line parallel to  $3x - 2y - 5 = 0$  and passing through intersecting point of lines  $2x + 3y - 7 = 0$  and  $3x + y - 7 = 0$ .

(B) Find an equation of a line having slope  $\frac{3}{5}$  and passing through the point of intersection of lines  $x - 2y + 3 = 0$  and  $2x - 3y + 4 = 0$ .

**OR**

1. (A) Find the equation of a straight line which passes through the point  $(2, -5)$  and the point of intersection of two lines  $2x + 3y - 8 = 0$  and  $3x + y - 5 = 0$ .

(B) For what value of "k" if following lines are (i) parallel and (ii) perpendicular.  
 $3x - (k + 1)y + 3 = 0$  and  $4x - ky + 5 = 0$

2. (A) A person has deposited ₹ 1,00,000 in a bank at compound interest of 10% per year. Find the amount in his bank account after 20 years. Also find compound interest.

(B) A person deposit ₹ 10,000 in the beginning of every year. If the rate of compound interest is 12% then find the amount after 10 years.

**OR**

2. (A) A man lent ₹ 1,00,000 for 3 years and ₹ 2,00,000 for 5 years at the same rate of simple interest. He receives total interest ₹ 1,17,000. What is the rate of Simple interest ?

(B) A cameraman purchases a camera on instalment. He has to pay 7 annual instalments each of ₹ 36,000. If the rate of compound interest is 12% then find the present value of camera.

3. (A) If  $A = \begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & 2 \\ 2 & 2 & 1 \end{bmatrix}$ , satisfies the following equation.  $A^2 - 4A - 5I = 0$ . Where 0

is a null matrix and I is an identity matrix.

- (B) Solve the given equation by matrix method :

$$x + 2y + 3z = 6, 4x - 3y + 5z = 6 \text{ and } 2x + 3y + z = 6$$

**OR**

3. (A) Find AB and BA, if possible where

$$A = \begin{bmatrix} 1 & -1 & 1 \\ -2 & 2 & -1 \\ -2 & 1 & 0 \end{bmatrix} \text{ and } B = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 4 & 6 \\ 1 & 2 & 3 \end{bmatrix}$$

- (B) Find the inverse of the given matrix.  $A = \begin{bmatrix} -1 & -2 & 3 \\ -2 & 1 & 1 \\ 4 & -5 & 2 \end{bmatrix}$ .

4. (A) How many different numbers of six digits can be formed by using the digits 2, 1, 7, 9, 0, 5 ? How many of them will be divisible by 5 ?
- (B) Find n if  ${}^n C_2 = 28$ .

**OR**

4. (A) Gujarat Giants of 11 players is to be formed from 16 players including 4 bowlers and 2 wicket-keepers. In how many different ways a team can be formed so that the team contains : (i) Exactly 3 bowlers and 1 wicket-keeper, (ii) At least 3 bowlers and at least 1 wicket-keeper.
- (B) Find r, if  ${}^7 P_r = 60 \times {}^7 P_{r-3}$ .

5. Do as Directed : (Any **ten**)

**10**

- (1) In how many ways can four children be made to stand in a line such that two of them, A and B are always together ?

- (a) 6 (b) 12  
(c) 18 (d) 24

- (2) In how many ways can you arrange 5 different books on a shelf ?
- (a) 10 (b) 25  
(c) 120 (d) 720
- (3) If  ${}_n C_r = 10$ , then what is the value of  ${}_n C_{(n-r)}$  ?
- (a) 1 (b) 10  
(c) 20 (d) n
- (4) What is the slope of the line passing through the points (3, 5) and (7, 9) ?
- (a) 1 (b) 2  
(c) 4 (d) 0.5
- (5) If A is a  $2 \times 3$  matrix and B is a  $3 \times 2$  matrix, what is the order of AB ?
- (a)  $2 \times 2$  (b)  $3 \times 3$   
(c)  $2 \times 3$  (d)  $3 \times 2$
- (6) Which of the following is NOT a valid matrix operation ?
- (a) Matrix Addition  
(b) Transpose of a matrix  
(c) Scalar Multiplication  
(d) Division of one Matrix by another matrix
- (7) If A is a square matrix such that  $A = A^T$ , then A is :
- (a) Diagonal (b) Symmetric  
(c) Singular (d) Column
- (8) What is the formula for Simple Interest (SI) ?
- (a)  $SI = \frac{P \times R \times N}{100}$  (b)  $SI = \frac{P \times R^N}{100}$   
(c)  $SI = P \times N$  (d)  $SI = \frac{R \times N}{100}$

- (9) Find the compound interest on ₹ 5,000 at 10% p.a. compounded annually for 2 years.
- (a) 500 (b) 1000  
(c) 1050 (d) 1100
- (10) An annuity involves :
- (a) A one-time payment  
(b) Payments are made at irregular intervals  
(c) A lump sum paid at the beginning  
(d) A series of equal payments made at regular intervals
- (11) The ancient Indian mathematician Pingala is best known for his work on :
- (a) Geometry (b) Astronomy  
(c) Binary numbers and prosody (d) Trigonometry
- (12) What is the slope value for linear equation of line  $5x + 6y - 11 = 0$  ?
- (a)  $\frac{-5}{6}$  (b)  $\frac{-6}{5}$   
(c)  $\frac{11}{5}$  (d)  $\frac{6}{11}$
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