

BRIDGE COURSE - 2011

Note : Attempt any two parts from each question. All questions carry equal marks.

1. (a) Break $\frac{x+1}{x^2-3x+2}$ into partial fraction.

(b) Evaluate the determinant : $A = \begin{bmatrix} 6 & 3 & -2 \\ 5 & 6 & 4 \\ 1 & 8 & 7 \end{bmatrix}$

(c) If $A = \begin{bmatrix} 3 & -2 \\ 4 & 1 \end{bmatrix}$, $B = \begin{bmatrix} 2 & 4 \\ 5 & 7 \end{bmatrix}$ then find AB and $(AB)^{-1}$.

(d) Find the sum of the series :
 $2+6+10+14+18+\dots$ upto 25 terms.

2. (a) Expand $(4x - 3y)^7$ by binomial theorem.

(b) Find the value of : $\frac{e + e^{-1}}{2}$

(c) If ${}^{15}P_r = 2730$, then find the value of r .

(d) Find the value of : $\log_6(1 + 3x + 2x^2)$

3. (a) Find the maximum value of : $6 \cos \theta + 8 \sin \theta$

(b) Find the value of $\sin 75^\circ$

(c) Find the value of : $\tan^{-1}(1) + \tan^{-1}(2) + \tan^{-1}(3)$

(d) Find the angle of elevation of the sun when the shadow of the pole is same as the height of the pole.

4. (a) Find the angle between the pair of straight lines :

$$x^2 + 4y^2 - 7xy = 0$$

(b) Find the distance between the points (8, 7) and (4, 4).

(c) Find the slope of the line passing through the points (3, 6) and (7, 2).

(d) Find the eccentricity of the ellipse : $\frac{x^2}{64} + \frac{y^2}{28} = 1$

5. (a) Find the mean of first n natural numbers.

(b) Find the mode from the following size of shoes :
size of shoes 3, 4, 2, 1, 7, 6, 6, 7, 5, 6, 8, 9, 5

(c) Find the median for the following data :

Marks less than	Frequency
5	2
10	4
15	14
20	27
25	48
30	64
35	72
40	75

(d) Find the standard deviation of the following numbers :
3, 4, 9, 11, 13, 6, 8, 10