

**MODEL QUESTION PAPER IN
MATHEMATICS (BRIDGE COURSE)
FOR SECOND YEAR Bi.P.C. Students**

Time : 3 Hrs.

Max.Marks: 75

Note: This Question Paper Consists of two sections A and B.

SECTION – A

Short Answer Type Questions.

Answer ALL Questions.

10×3=30

Each Question Carries THREE marks.

1. If $A = \begin{bmatrix} 2 & 3 & 4 \\ 5 & 7 & 9 \\ -2 & 1 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 4 & 0 & 5 \\ 1 & 2 & 0 \\ 0 & 3 & 1 \end{bmatrix}$ prove that $(A+B)^T = A^T + B^T$.
2. Find the coefficient of x^n in $(1+x)e^x$.
3. Find the equation of the circle concentric with the circle $x^2 + y^2 - 4x - 8y + 7 = 0$ and passing through the point $(-2, 1)$.
4. Find the equation of the parabola whose focus is $(-3, 0)$ and directrix is $x+5 = 0$.
5. Find the centre and radians of the circle $r^2 - 2r(12 \cos \theta + 5 \sin \theta) - 120 = 0$.
6. Show that the points A $(3,-2,4)$, B $(1,1,1)$, C $(-1,4,-2)$ are collinear.
7. Find the angle between the lines whose direction ratios are $(4, -3,5)$ and $(3,4,5)$.
8. Evaluate $\int x^2 e^x dx$.
9. Evaluate $\int_0^{\pi/4} \sec^4 x dx$.
10. Form the differential equation by eliminating the constants a and b of the equation $xy = ae^x + be^{-x} + x^2$.

SECTION – B

Long Answer Type Questions.

Answer any THREE Questions.

3×15=45

Each Question Carries FIFTEEN marks.

11. a) Find the inverse of the matrix $\begin{bmatrix} 1 & 0 & 2 \\ 2 & 1 & 0 \\ 3 & 2 & 1 \end{bmatrix}$ (8 M)

b) Resolve into partial fractions: $\frac{x^2 - x + 1}{(x+1)(x-1)^2}$ (7 M)

12. a) Find the equation of the circle passing through the points (1,2), (3,-4), (5,-6). (8 M)

b) Find the vertex, latus rectum, axis, focus and directrix of the parabola (7 M)

$$y^2 + 6y - 2x + 5 = 0$$

13. a) Find the equation of the tangent at (3,-1) to the circle $x^2 + y^2 - 2x + 4y = 0$.

Also find the equation of the tangent parallel to the above tangent. (8 M)

b) Find the eccentricity, foci, length of latusrectum and equations to the tangents at the

vertices of the ellipse $\frac{x^2}{25} + \frac{y^2}{4} = 1$. (7 M)

14. a) Evaluate $\int \frac{3x-1}{2x^2-4x+3} dx$ (8 M)

b) Evaluate $\int_0^{\pi/2} \frac{dx}{\sin x + \cos x}$ (7 M)

15. a) Evaluate $\int \frac{2\cos x + 3\sin x}{4\cos x + 5\sin x} dx$ (8 M)

b) Solve: $\frac{dy}{dx} = xy + 2x - 3y - 6$ (7 M)