MATHS

BOOKS - VGS PUBLICATION-BRILLIANT

MATHEMATICS - II (B) MODEL PAPER 9

Section A I Very Short Answer Type Questions

1. Find the equation of the tangent to

$$x^2 + y^2 - 6x + y2y - 12 = 0 \quad \text{at} \quad (-1, 1)$$

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2. If the length of the tangent from $(5, 4)$ to the circle $x^2 + y^2 + 2ky = 0$ is 1 the n find k.

3. Show that the circles given by the following equation intersect each other orthogonally.

$$x^2 + y^2 - 2x - 2y - 7 = 0,$$

$$3x^2 + 3y^2 - 8x + 29y = 0.$$

4. Find the coordinates of the points on the parabola $y^2 = 2x$ whose focal distance is $\dfrac{5}{2}$.

5. If the eccentricity of a hyperbola is $\dfrac{5}{4}$, then find the eccentricity of its conjugate-hyperbola.

6. Evaluate

$$\int \frac{1}{\sqrt{\sin^{-1} x}\sqrt{1-x^2}}dx \quad \text{on} \quad I = (0,1)$$

7. Evaluate $\int x^2 \cos x\, dx.$

8. Evaluate $\int_0^a \frac{dx}{x^2 + a^2}$

9. Find the area bounded by the parabola $y = x^2$, the x-axis and the lines $x = -1, x = 2$.

10. Find the order and degree of

$$\left(\frac{d^2y}{dx^2} + \left(\frac{dy}{dx} \right)^3 \right)^{\frac{6}{5}} = 6y$$

1. Find the pole of $x + y + 2 = 0$ with respect to the circle

$$x^2 + y^2 - 4x + 6y - 12 = 0.$$

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2. Find the equation and length of the common chord of the following circles.

$$x^2 + y^2 + 2x + 2y + 1 = 0,$$

$$x^2 + y^2 + 4x + 3y + 2 = 0.$$

3. Find the condition for the line

lx+my+n=0 to be a tangent to the ellipse

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$$

4. Find the eccentricity, co ordinates of foci-

length of latus rectum and equation of

directrices of the folloeing ellipses.

$$3x^2 + y^2 - 6x - 2y - 5 = 0$$

5. Find the equation of the tangents to the hyperbola $3x^2 - 4y^2 = 12$ which are (i) Parallel and (ii) perpendicular to the line $y = x - 7$

6. Find the equation of the tangents to the hyperbola $3x^2 - 4y^2 = 12$ which are Perpendicular to the line $y = x - 7$

7. Evaluate $\displaystyle\int_0^{\pi/2} \frac{\cos^{5/2} x}{\sin^{5/2} x = \cos^{5/2} x} dx$

8. The solution of $(1 + y^2)\,dx = (\tan^{-1} y - x)\,dy$ is

Section C Iii Long Answer Type Questions

1. If (2,0),(0,1),(4,5) and (0,c) are concyclic then find c.

2. Find the equation to all possible common tangents of the circles.

$$x^2 + y^2 - 2x - 6x + 6 = 0 \text{ and } x^2 + y^2 = 1$$

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3. Derive the equation of a parabola in the standard form $y^2 = 4ax$ with diagram.

4. Obtain reduction formula for $I_n = \int \sin^n x\, dx$ for an integer $n \geq 2$ and deduce the value of $\int \sin^4 x\, dx$.

5. $\int \dfrac{dx}{3\cos x + 4\sin x + 6}$

6. Evaluate

(i) $\int_0^\pi \dfrac{x \sin x}{1 + \sin x} dx$

7. The solution of $\dfrac{dy}{dx} = \dfrac{x - 2y + 3}{2x - y + 5}$ is