MATHS

BOOKS - VGS PUBLICATION-BRILLIANT

MATHEMATICS-II(B) MODEL PAPER 3

Section A

1. Find the equation of the circle passing through (3,4) and having the centre at (-3,4)

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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.

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3. If the the angle between the circles $x^2 + y^2 - 12x - 6y + 41 = 0$ and $x^2 + y^2 + kx + 6y - 59 = 0$ is 45° find k.

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4. If ((1)/(2),2) is one extermity of a focalchord of the parabola $y^2 = 8x$. Find the co-ordinates of the other extremity.

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5. Find the equation of the hyperbola whose are $(\pm 5, 0)$ the transverse axis is of length 8.

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6. Evaluate the integerals.

$$\int \frac{(3x+1)^2}{2x} dx x \in I \subset R\backslash\{0\}$$

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7. Evaluate : $\int \frac{\log x}{x} dx$.

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8. Evaluate $\lim_{n \to \infty} \frac{2^k + 4^k + 6^k + \ldots + (2n)^k}{n^{k+1}}$ by using the method of finding definite integral as the limit of a sum.

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9. Find the value of the integral

$$\int_0^{2\pi} \sin^2 x \cos^4 x dx$$

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10. Solve $\frac{dy}{dx} = e^{x-y} + x^2 e^{-y}$.

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Section B

1. Find the equation of the circle with centre $(-2, 3)$ cutting a chord length 2 units on $3x + 4y + 4 = 0$

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2. Find the equation of the circle which passes through the origin and intersects each of the following circles orthogonally.

$x^2 + y^2 - 4x + 6y + 10, x^2 + y^2 + 12y + 6 = 0$

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3. Find the length of major axis,minor axis, latus rectum, eccentricity co-ordinates of centre, foci and the equations of directrices of the following ellipse.

$4x^2 + y^2 - 8x + 2y + 1 = 0$

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4. A circle of radius 4, is concentric with the ellipse $3x^2 + 13y^2 = 78$. Prove that a common tangent is inclined to the major axis at an angle $\frac{\pi}{4}$

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5. Tangents to the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ make angle θ_1, θ_2 with transvrse axis of a hyperbola. Show that the points of intersection of these tangents lies on the curve $2xy = k\left(x^2 - a^2\right)$ when $\tan\theta_1 + \tan\theta_2 = k$

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6. Evaluate : $\int_0^{\frac{\pi}{4}} \log(1 + \tan x)dx$

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7. Solve $\frac{1}{x}\frac{dy}{dx} + y.\, e^{x} = e^{(1-x)\,e^{x}}$

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Section C

1. Find the equation of the circle passing through (2, 1), (5, 5), (-6, 7).

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2. Show that $x^2 + y^2 - 6x - 9y + 13 = 0, x^2 + y^2 - 2x - 16y = 0$ touch each other . Find the point of contact and the equation of common tangent at their point of contact.

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3. Find the equation of the parabola whose axis is parallel to X-axis and which passes through these points.

(-2,1),(1,2), and (-1,3)

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4. $\int (6x+5)\sqrt{6-2x^2+x}dx$

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5. Show that

If $I_n = \int \cos^n x dx$, then show that

$I_n = \frac{1}{n}\cos^{n-1} x \sin x + \frac{n-1}{n} I_{n-2}$.

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6. $\int_0^{\pi} \frac{x}{1+\cos^2 x} dx =$

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7. Solve $\left(x^3 - 3xy^2\right)dx + \left(3x^2y - y^3\right)dy = 0$

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