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## MATHS

## BOOKS - VGS PUBLICATION-BRILLIANT

## MATHEMATICS -II(B) MODEL PAPER 5

Section A

1. If $x^{2}+y^{2}+2 g x+2 f y=0$ represents a circle with cerntre $(-4,-3)$ then find $\mathrm{g}, \mathrm{f}$ and the radius of the circle.
2. If the length of the tangent from $(2,5)$ to
the circle $x^{2}+y^{2}-5 x+4 y+k=0$ is
$\sqrt{37}$ then find k .

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3. Find the angle between the circles
$x^{2}+y^{2}+4 x-14 y+28=0$ and
$x^{2}+y^{2}+4 x-5=0$

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4. Find the equation of the parabola whose vertex is
$(3,-2)$ and focus is $(3,1)$.

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5. If the angle between the asymptotes is $30^{\circ}$ then find its eccentricity.

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6. $\int \sec ^{2} \operatorname{cosec}^{2} x d x=$
7. $\int \frac{(1+x) e^{x}}{\cos ^{2}\left(x e^{x}\right)} d x=$

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8. Evaluate the integrals .
$\int_{0}^{4}|2-x| d x$

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9. Find $\int_{0}^{2 \pi} \sin ^{4} x \cos ^{6} x d x$
10. The differential equation of curve given by $y=a \cos \left(\frac{n}{x}+b\right)$ (a,b are arbitrary constants)

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## Section B

1. Show that $x+y+1=0$ touches the circle $x^{2}+y^{2}-3 x+7 y 14=0$ and find its point of contact.
2. If $x+y=3$ is the equation of the chord $A B$ of the circle $x^{2}+y^{2}-2 x+4 y-8=0$, find the equation of the circle having as diameter.

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3. Find the equation of the ellipse in the standard form
such that distance between foci is 8 and distance between directrices is 32 .
4. Find the equations of tangents to the ellipse $2 x^{2}+y^{2}=8$ which are Parallel to $x-2 y-4=0$

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5. Find the equations of tangents to the ellipse $2 x^{2}+y^{2}=8$ which are
perpendicular to $x+y+2=0$
6. Find the centre, foci, eccentricity equation of the directrices, length of the latus rectum of the hyperbola.
$16 y^{2}-9 x^{2}=144$

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7. Evaluate $\int_{0}^{\pi / 2} \frac{a \sin x+b \cos x}{\sin x+\cos x} d x$

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8. Solve the following differential equations.
$\frac{d y}{d x}+\frac{4 x}{1+x^{2}} y=\frac{1}{\left(1+x^{2}\right)^{2}}$

## Section C

1. Show that the following four points in each jof the following are concyclic and
find the equation of the circle on which they lie.
$(1,1),(-6,0),(-2,2),(-2-8) 1$

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> 2. Show $x^{2}+y^{2}-6 x-2 y+1=0, x^{2}+y^{2}+2 x-8 y+13=0$
touch each other find the point of contact and the equation of the common tangent at their point of contact.

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3. Show that the equation of common tangents to the circle $x^{2}+y^{2}=2 a^{2}$ and the parabola $y^{2}=8 a x$ are $y= \pm(x+2 a)$.

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4. Evaluate $\left.\int \frac{2 x+5}{\sqrt{x^{2}-2 x+10}}\right) d x$.
5. Obtain the reduction formula for $I_{n}=\int \sec ^{n} x d x, \mathrm{n}$ is a positive integer $n \geq 2$ and deduce the value of $\int \sec ^{5} x d x$

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6. Show that the area of the region bounded by $\frac{x^{2}}{a^{2}}+\frac{y^{2}}{b^{2}}=1$ (ellipse) is $\pi \mathrm{ab}$. Also deduce the area of the circle $x^{2}+y^{2}=a^{2}$
7. Solve the following differential equations.

$$
\left(x^{2}-y^{2}\right) d x-x y d y=0
$$

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