



MATHS

BOOKS - VGS PUBLICATION-BRILLIANT

MODEL PAPER 8

Section A Very Short Answer Type Questions



2. If $\left(\sqrt{3}i
ight)^{100}=2^{99}(a+ib).$ Then shot that $a^2+b^2=4$

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3. If A,B,C are angles of a triangle such that x=cisA, y=cisB, z=cisC, then find the value of xyz .

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4. If α , β are the roots of the equation $ax^2 + bx + c = 0$, find the value $\frac{1}{\alpha^2} + \frac{1}{\beta^2}$ expressions in terms of a,b,c.



7. Find the number of positive divisors of 1080



8. If ${}^{22}C_r$ is the largest binomial coefficient in the expansion of $(1+x)^{22}$, find the value of ${}^{13}C_r$.

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9. Find the mean deviation about the median for the

following data

13,17,16,11,13,10,16,11,18,12,17



10. The mean and variance of a binomial distribution are 4 and 3 respectively. Fix the distribution and find $P(X \ge 1)$.



2. Prove that
$$\frac{1}{3x+1} + \frac{1}{x+1} - \frac{1}{(3x+1)(x+1)}$$

does not lie between 1 and 4, if x is real.
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3. If the letters of the word EAMCET are permuted in all possible ways and if the words thus formed are arranged in the dictionary order, find the rank of the word EAMCET.



4. Simplify
$${}^{34}C_5 + \sum\limits_{r=0}^4 {}^{(38-r)}C_4.$$



5. Resolve
$$rac{x^2-3}{(x+2)(x^2+1)}$$
 into partial fractions.

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6. The probability for a contractor to get a road contract is $\frac{2}{3}$ and to get a building contract is $\frac{5}{9}$. The probability to get atleast on contract is $\frac{4}{5}$. Find the probability to get both the contracts.

7. A speaks the truth in 75% of the cases , B in 80% cases. What is the probability that their statements about an incident do not match ?



Section C Long Answer Type Questions

1. If $\coslpha+\coseta+\cos\gamma=0\sinlpha+\sineta+\sin\gamma$,

Prove that

$$\cos^2lpha+\cos^2eta+\cos^2\gamma=rac{3}{2}=\sin^2lpha+\sin^2eta+\sin^2\gamma$$

2. Solve the equation

$$2x^5 + x^4 - 12x^3 - 12x^2 + x + 2 = 0$$

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3. If P and Q are the sum of odd terms and the sum of even terms respectively in the expansion of $(x + a)^n$ then prove that

$$4PQ = (x+a)^{2n} - (x-a)^{2n}$$

4. Find the sum of the infinite series $\frac{7}{5} \left(1 + \frac{1}{10^2} + \frac{1.3}{1.2} \cdot \frac{1}{10^4} + \frac{1.3.5}{1.2.3} \cdot \frac{1}{10^6} + \dots \right)$ Watch Video Solution

5. Find the mean deviation about the mean for the following data:

6, 7, 10, 12, 13, 4, 8, 12

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6. Three boxes numbered I,II,III contains the balls as follows :

	White	Black	Red
1	1	2.	3
li	2	1	.1
111	. 4	5	3

One box is randomly selected and a ball is drawn from it . If the ball is red , then find the probability that it is from box II .



7. A random variable X has the following probability distribution.



Find (i) k (ii) Mean (iii) P(0 < X < 5)

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Section A Very Short Answer Type Questions

1. If the circle
$$x^2 + y^2 - 4x + 6y + a = 0$$
 has radius 4,

find a.

2. Write the parametric equations of the circle
$$(x-3)^2 + (y-4)^2 = 8^2$$
.





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4. Find the co-ordinates of the point on the parabola $y^2 = 8x$ whose focal distance is 10.



7.
$$\int \frac{x^8}{1+x^{18}} dx on R.$$



8. Find
$$\int_{-\pi/2}^{\pi/2} \sin^2 x \cos^4 x dx$$

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9. Evaluate the definite integrals .

$$\int\limits_{0}^{\pi}\sqrt{2+2\cos heta}d heta$$



10. Find the order and degree of the differential

equation
$$\left[rac{d^2y}{dx^2} + \left(rac{dy}{dx}
ight)^3
ight]^{6/5} = 6y.$$

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Section B Short Answer Type Questions

1. Find the pole of 3x + 4y - 045 = 0 with

respect to $x^2+y^2-6x8y+5=0$

2. Find the equation of the circle which cuts the circles

$$x^2 + y^2 - 4x - 6y + 11 = 0$$
 and

 $x^2+y^2-10x-4y+21=0$ orthogonally and has

the diameter along the line 2x+3y=7.



3. Show that the points of intersection of the perpendicular tangents to an ellipse lies on a circle.



4. Find the value of k if 4x+y+k=0 is a tangent to the ellipse $x^2 + 3y^2 = 3$. **Watch Video Solution**

5. Find the centre, foci, eccentricity equation of the directrices, length of the latus rectum of the hyperbola. $x^2 - 4y^2 = 4$

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6. Evaluate
$$\int_0^{\pi/2} rac{dx}{4+5\cos x}$$

7. Solve the following differential equations.

$$ig(1+x^2ig)rac{dy}{dx}+y=e^{ an^{-1}x}$$

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Section C Long Answer Type Questions

1. Find the equation of a circle which passes

through (4, 1)(6, 5) and having the centre

on 4x + 3y - 24 = 0



2. Show that the circles $x^2 + y^2 - 6x - 2y + 1 = 0, x^2 + y^2 + 2x - 8y + 13 = 0$ 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 common tangent to the parabola

$$y^2 = 4ax$$
and $x^2 = 4by$ is

$$xa^{1/3} + yb^{1/3} + a^{2/3}b^{2/3} = 0.$$

4.
$$\int \frac{2 \sin x + 3 \cos x + 4}{3 \sin x + 4 \cos x + 5} dx.$$
Solution
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$$f_n = \int \cot^n x dx, \text{ n}$$
being a positive integer , $n \ge 2$ and deduce the value of $\int \cot^4 x dx$.
Solution
$$f_n = \int \cot^n x dx.$$
Solution
$$f_n = \int \cot^n x dx, \text{ n}$$

7. Solve the following differential equations.

$$ig(x^2+y^2ig) dy=2xydx$$

