# © 'doubtnut 

## MATHS

## BOOKS - VGS PUBLICATION-BRILLIANT

## MODEL PAPER 6

Section A Very Short Answer Type Questions

1. Write the complex number $(2+3 i)(3+4 i)$ in the form $A+i B$.

- Watch Video Solution

2. If $z_{1}=-1, z_{2}=i$ then find $\operatorname{Arg}\left(\frac{z_{1}}{z_{2}}\right)$
3. If $1, \omega, \omega^{2}$ are the cube roots of unity prove that
$(a+b)\left(a \omega+b \omega^{2}\right)\left(a \omega^{2}+b \omega\right)=a^{3}+b^{3}$

## D Watch Video Solution

4. If the equation $x^{2}-15-m(2 x-8)=0$ has equal roots, find the value of ' $m$ '.

## D Watch Video Solution

5. If the product of the roots of $4 x^{3}+16 x^{2}-9 x-a=0$ is 9, then find a.

## (D) Watch Video Solution

6. Find the number of different chains that can be prepared using 7 different coloured beads.
7. If ${ }^{n} P_{r}=5040$ and ${ }^{n} C_{r}=210$, find n and r .

## - Watch Video Solution

8. Prove that : Find the set E of the value of x for which the binomial expansions for the following are valid

$$
(3-4 x)^{3 / 4}
$$

## - Watch Video Solution

9. Find the mean deviation about the median for the following data 4,6,9,3,10,13,2

- Watch Video Solution

10. The probability that a person chosen at random is left handed (in hand writing) is 0.1 what is the probability that in a group of ten people there is one and only one who is left handed.

## - Watch Video Solution

## Sectio B Short Answer Type Questions

1. If a point $p$ dentes a complex number $z=x+i y$ in the argand plane and if $\frac{z+1}{z+i}$ is a purely real number, then the locus of p is

## - Watch Video Solution

2. Prove that $\frac{1}{3 x+1}+\frac{1}{x+1}-\frac{1}{(3 x+1)(x+1)}$ does not lie between 1 and 4 , if x is real.
3. If the letters of the word PRISON are permuted in all possible ways and the words thus formed are arranged in dictionary order, find the rank of the word. PRISON

## - Watch Video Solution

4. Simplify ${ }^{34} C_{5}+\sum_{r=0}^{4}\left({ }^{(38-r)} C_{4}\right.$.

## - Watch Video Solution

5. Resolve $\frac{x^{2}-3}{(x+2)\left(x^{2}+1\right)}$ into partial fractions.

## - Watch Video Solution

6. State and prove addition theorem on probability.
7. Suppose $A$ and $B$ are independent events with $P(A)=0.6 P(B)=0.7$. Compute
$P(A \cap B)$

Watch Video Solution
8. Suppose $A$ and $B$ are independent events with $P(A)=0.6 \& P(B)=0.7$

Compute
$P(A \cup B)$

## - Watch Video Solution

9. Suppose $A$ and $B$ are independent events with $P(A)=0.6 P(B)=0.7$.

Compute
$P(B / A)$
10. Suppose $A$ and $B$ are independent events with $P(A)=0.6 P(B)=0.7$.

Compute
$P\left(A^{c} \cap B^{c}\right)$

## - Watch Video Solution

## Section C Long Answer Type Questions

1. If n is an integer then show that
$(1+\cos \theta+i \sin \theta)^{n}+(1+\cos \theta-i \sin \theta)^{n}=2^{n+1} \cos ^{n}(\theta / 2) \cos \left(\frac{n \theta}{2}\right)$

## - Watch Video Solution

2. The roots of $2 x^{5}+x^{4}-12 x^{3}-12 x^{2}+x+2=0$ are

## Watch Video Solution

3. If the coefficients of 4 consecutive terms in the expansion of $(1+x)^{n}$ are $a_{1}, a_{2}, a_{3}, a_{4}$ respectively, then show that
$\frac{a_{1}}{a_{1}+a_{2}}+\frac{a_{3}}{a_{3}+a_{4}}=\frac{2 a_{2}}{a_{2}+a_{3}}$

## - Watch Video Solution

4. If $x=\frac{1.3}{3.6}+\frac{1.3 .5}{3.6 .9}+\frac{1.3 .5 .7}{3.6 .9 .12}+\ldots$. then prove that $9 x^{2}+24 x=11$.

## - Watch Video Solution

5. The mean deviation about the mean for the data is

| Marks obtained | $0-10$ | $10-20$ | $20-30$ | $30-40$ | $40-50$ |
| :--- | :---: | :---: | :---: | :---: | :---: |
| Number ofstudents | 5 | 8 | 15 | 16 | 6 |

## - Watch Video Solution

6. Three Urns have the following composition of balls.

Urn I : 1 white, 2 black
Urn II : 2 white, 1 black

III : 2 white, 2 black
One of the Urn is selected at random and a ball is drawn. It turns out to be white. Find the probability that it come from Urn III.

## - Watch Video Solution

7. The probability distribution of a random variable Xis given below:

| $X_{1}=\mathrm{x}_{1}$ | $\mathbf{1}$, | $\mathbf{2}$ | .3 | 4 | 5 |
| :---: | :---: | :---: | :---: | :---: | :---: |
| $\mathrm{P}\left(\mathrm{X}=\mathrm{x}_{1}\right)$ | k | $\mathbf{2 k}$ | 3 k | 4 k | $\mathbf{5 k}$ |

Find the value of $k$ and the mean and variance of $X$.

## - Watch Video Solution

