MATHS

BOOKS - VGS PUBLICATION-BRILLIANT

MODEL PAPER 10

Section A I Very Short Answer Type Questions

1. Write the conjugate of complex number $\frac{5i}{7+i}$

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2. Express 1 - i in modulas - amplitude form.

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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. For what values of x, the following expressions are negative ?

$15 + 4x - 3x^2$

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5. Find the transformed equation whose roots are the negative of the roots of $x^4 + 5x^3 + 11x + 3 = 0$

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6. Find the number of 4 letter words that can be formed using the letters of the word PISTON in which atleast one letter is repeated.

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7. If $10.\ {}^{n}C_{2} = 3.\ {}^{n+1}C_{3}$ find n.

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8. Prove the $C_0 + 2.\ C_1 + 4.\ C_2 + 8.\ C_3 + \ldots + 2^n.\ C_n = 3^n$

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9. Find the variance for an ungrouped data 5, 12, 3, 18, 6, 8, 2, 10.

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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.

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Section B Ii Short Answer Type Questions

1. Show that the points in the Argand plane represented by the complex numbers $-2+7i, -\frac{3}{2}+\frac{1}{2}+i4-3i\frac{7}{2}(1+i)$ are the vertices of a rhombus.

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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 MASTER are permuted in all possible ways and the words thus formed are arranged in the dictionary order, then find the rank of the word MASTER.

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4. Prove that $\frac{{}^{4n}C_{2n}}{{}^{2n}C_n} = \frac{1.3, 5.....(4n-1)}{\{1.3.5.... (2n-1)\}^2}$

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5. Resolve the $\frac{2x^2+3x+4}{(x-1)(x^2+2)}$ into partial fractions.

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6. If A,B,C are three events , Show that

$p(A \cup B \cup C) = P(A) + P(B) + P(C) - P(A \cap B) - P(B \cap C) - P(C$

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7. A problem in calculus is given to two students, A and B whose chances of solving it are 1/3, 1/4 respectively. Find the probability of the problem

being solved if both of them try'independently.

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Section C Iii Long Answer Type Questions

1. A : $(1+i)^6 + (1-i)^6 = 0$

R : If n is a positive integer then $(1+i)^n + (1-i)^n = 2^{(n/2)+1} . \cos \frac{n\pi}{4}$

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2. Solve $x^4 - 4x^2 + 8x + 35 = 0$,given that $2 + i\sqrt{3}$ is a root.

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3. If the coefficients of r^{th}, $(r+1)^{\text{th}}$ and $(r+2)^{\text{nd}}$ terms in the expansion of $(1+x)^n$ are in A.P. then show that

$n^2 - (4r + 1)n + 4r^2 - 2 = 0.$

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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 $9x^2 + 24x = 11.$

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5. Find the mean deviation from the mean for the following continuous frequency distribution.

Sales in Rs. thousand	$40 - 50$	$50 - 60$	$60 - 70$	$70 - 80$	$80 - 90$	90
Number of Companies	5	15	25	30	20	5

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6. State and prove Baye's theorem.

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7. The range of a random variable X is {0, 1, 2}.

Given that

$P(X=0)=3C^3, P(X=1)=4C-10C^2, P(X=2)=5C-1$

Find the value of C.

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8. The range of a random variable X is $\{0,1,2\}$. Given that

$P(X=0)=3c^3, P(X=1)=4c-10c^2, P(X=2)=5c-1$

i) Find the value of c

ii) $P(X<1), P(1<X\leq 2)$ and $P(0<X\leq 3)$

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9. The range of a random variable X is $\{0,1,2\}$. Given that

$P(X=0)=3c^3, P(X=1)=4c-10c^2, P(X=2)=5c-1$

i) Find the value of c

ii) $P(X<1), P(1<X\leq 2)$ and $P(0<X\leq 3)$

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