

Vidya Vikas Mandal's
Ramacrisna Madeva Salgaocar Higher Secondary School
Margao Goa

Std: XI VOC – CT
Date: 25/07/25

Mid Term Exam July, 2025
Subject : Mathematics (voc)

Duraton: 1 hr.
Marks:20

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- Instructions : 1) All questions are compulsory.
2) Write the number of questions clearly.

Question numbers from 1 to 4 carry 1 mark each.

1. Express the following in the form of $a+ bi$.

$$i(2+4i)(1+i)$$

2. Find the roots of the following quadratic equation.

$$3x^2 - 4x - 1 = 0$$

3. If one root of $kx^2 - x - 1 = 0$ is 1, find the value of k .
4. Find k , if equation $x^2 + x + k = 0$ have equal roots.

Question numbers from 5 to 7 carry 2 marks each.

5. Express the following in $a+bi$ where $a, b \in \mathbb{R}$

$$\frac{3+2i}{4-3i}$$

6. Find x and y where $x, y \in \mathbb{R}$ if

$$x(1+3i)+(2-i)y=5+i$$

7. Represent $1+\sqrt{3}i$ in polar form.

Question numbers from 9 and 10 carry 3 marks each.

9. Find the square root of the following complex number

$$24 - 10i$$

10. If one root of the equation $5x^2 + 6x + K = 0$ is 5 times the other, find the value of k .

Question number 11 carry 4 marks

11. If α and β are the roots of equation $x^2 - 5x + 8 = 0$, find the value of

$$\text{i) } \alpha^2 + \beta^2 \quad \text{ii) } \frac{1}{\alpha^3} + \frac{1}{\beta^3}$$
