

SIR CV RAMAN COACHING CENTRE- IDAPPADI ,

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XII- MATHS EXERCISE 2.1,2.2,2.3,2.4. SLIP TEST QUESTION PAPER - 2024

SECTION - A ( 7 X 5 = 35 M)

ANSWER ANY SEVEN QUESTIONS

$$1. \quad i^{1947} + i^{1950} \quad \text{and} \quad i^{59} + \frac{1}{i^{59}} \quad \text{and} \quad \sum_{n=1}^{10} i^{n+50}$$

Find the values of the real numbers  $x$  and  $y$ , if the complex numbers  $(3-i)x - (2-i)y + 2i + 5$  and  $2x + (-1+2i)y + 3 + 2i$  are equal.

2.

Given the complex number  $z = 2 + 3i$ , represent the complex numbers in Argand diagram

$$3. \quad \text{(i) } z, iz, \text{ and } z + iz \quad \text{(ii) } z, -iz, \text{ and } z - iz.$$

If  $z_1 = 2 + 5i$ ,  $z_2 = -3 - 4i$ , and  $z_3 = 1 + i$ , find the additive and multiplicative inverse of  $z_1$ ,  $z_2$ , and  $z_3$ .

4.

Show that (i)  $(2 + i\sqrt{3})^{10} + (2 - i\sqrt{3})^{10}$  is real and (ii)  $\left(\frac{19+9i}{5-3i}\right)^{15} - \left(\frac{8+i}{1+2i}\right)^{15}$  is purely imaginary.

5.

The complex numbers  $u, v$ , and  $w$  are related by  $\frac{1}{u} = \frac{1}{v} + \frac{1}{w}$ .

If  $v = 3 - 4i$  and  $w = 4 + 3i$ , find  $u$  in rectangular form.

6.

Show that (i)  $(2 + i\sqrt{3})^{10} - (2 - i\sqrt{3})^{10}$  is purely imaginary

$$\text{(ii) } \left(\frac{19-7i}{9+i}\right)^{12} + \left(\frac{20-5i}{7-6i}\right)^{12} \text{ is real.}$$

7. Write the following in the rectangular form:

$$\overline{3i} + \frac{1}{2-i}$$

8. Write the following in the rectangular form

$$\frac{10-5i}{6+2i}$$

The complex numbers  $u, v$ , and  $w$  are related by  $\frac{1}{u} = \frac{1}{v} + \frac{1}{w}$ .

If  $v = 3 - 4i$  and  $w = 4 + 3i$ , find  $u$  in rectangular form.

9.

Simplify  $\left(\frac{1+i}{1-i}\right)^3 - \left(\frac{1-i}{1+i}\right)^3$  into rectangular form

10.

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