

**NETTUR TECHNICAL TRAINING FOUNDATION
COMMON FOR ALL PROGRAMMES**

I SEMESTER REGULAR & SUPPLEMENTARY EXAMINATION-JAN 2023

Subject: Mathematics
Subject Code: CP00102T

Total Time: 2 Hr.
Total Marks: 50

PART B

1.0 ANSWER ANY EIGHT OF THE FOLLOWING

2*8=16

1.1 Find the LCM of 24 and 90

1.2 Perform the indicated action $A + B$ If $A = \begin{bmatrix} 3 & 2 & -1 \\ 4 & -3 & 1 \end{bmatrix}$ $B = \begin{bmatrix} 1 & -2 & 7 \\ 3 & 2 & -1 \end{bmatrix}$

1.3 If $Z_1 = 5-3i$ & $Z_2 = 2+4i$. Find $Z_1 + Z_2$ and $Z_1 - Z_2$

1.4 Find the value of $\sin 120$

1.5 Evaluate $\lim_{x \rightarrow 0} \frac{x+2}{2x+3}$

1.6 Differentiate $y = x^5$

1.7 HCF of two numbers is 25 and their LCM is 300. One of the numbers is 100, find the other number.

1.8 Find the median from the following data 16, 6, 8, 1, 0, 14, 18, 22

1.9 Prove that $(\sin A + \cos A)^2 = 1 + \sin 2A$.

1.10 If $\begin{vmatrix} 4 & 7 \\ x & -2 \end{vmatrix} = 0$ Find x

2.0 ANSWER ANY SIX OF THE FOLLOWING

3*6=18

2.1 Simplify $1\frac{1}{6} + 5\frac{2}{7} + \frac{4}{9}$

2.2 Find the area of the triangle whose vertices are (-4, -1), (3, 2), and (4, 6).

2.3 Convert into rectangular form $4(\cos 60^\circ + i \sin 60^\circ)$

2.4 Prove that $\sin^2 30 + \cos^2 60 - \tan^2 45 = -1/2$

2.5 Evaluate $\lim_{x \rightarrow \infty} \frac{5x^2 - 2x + 7}{3x^2 + 4x + 5}$

2.6 Evaluate $\begin{vmatrix} 2 & 6 & 8 \\ 3 & 0 & 1 \\ 0 & 3 & 2 \end{vmatrix}$

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2.7 Convert the complex number $1 + \sqrt{3}i$ into polar form.

2.8 The Geometric Mean of three numbers is 8. Two of the numbers are 4 and 32. What is the third number?

3.0 ANSWER ANY FOUR OF THE FOLLOWING

4*4=16

3.1 Solve $x^2 - 7x + 10 = 0$ using factorization method

3.2 Solve using Cramer's rule $5x + 7y = -4$; $4x - 3y = 14$

3.3 Divide the complex number $3 + 7i$ by $2 + 3i$.

3.4 Find the value of $\sin 75$

3.5 Find the differentiation of $y = x^3 \cos x$

3.6 Consider the following marks (out of 50) scored in mathematics by 50 trainees

41, 31, 33, 32, 28, 31, 21, 10, 30, 22, 33, 37, 12, 05, 08, 15, 39, 26, 41, 46, 34, 22, 09, 11, 16, 22, 25, 29, 31, 39, 23, 31, 21, 45, 47, 30, 22, 17, 36, 18, 20, 22, 44, 16, 24, 10, 27, 39, 28, 17.

Prepare a frequency distribution table (in inclusive method)