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

Std: XI VOC – CT | First Term Exam, October, 2024 | Duraton: 2 hr.
Date: 23/10/24 | Subject : Mathematics (voc) | Marks:40

Instructions :

i. All questions are compulsory
ii. There are four sections in this question paper(A,B,C&D)
iii. In section A there are 8 questions of 1 mark each.
iv. Section B contains 8 questions of 2 marks each.
v. Section C contains 4 questions of 3 marks each.
vi. Section D contains 1 question of 4 mark.
vii. Write the number of each question clearly on the answer book.

Section A

Question numbers from 1 to 8 carry 1 mark each.

1. Find Cartesian coordinates of a point whose polar coordinates are $(3, \frac{\pi}{4})$
2. Find distance between the following pair of points.
   A=(3,-3) and B=(4,3)
3. If □ ABCD is a parallelogram and A=(-2,4). B(-3,5) and D=(3,-2), find the coordinates of C.
4. Find the measure of angle in degree if its measure in radian is $\frac{2\pi}{3}$
5. If $\cos\Theta = \frac{5}{13}$, find $\sin\Theta$
6. Solve the following equation
   $\begin{vmatrix} 5 & x \\ -2 & 3 \end{vmatrix} = 23$
7. Find the value of following determinant
   $\begin{vmatrix} 2 & 1 & 3 \\ 3 & 3 & 4 \\ 2 & 1 & 5 \end{vmatrix}$
8. State any two laws of logarithm .

Section B

Question numbers from 9 to 16 carry 2 marks each.

9. Find the interior angle of a regular polygon of six sided in radian.
10. Find y ,if the distance between(2,-3) and (-1,y) is 5 units.
11. A(k,2) is the vertex of an isosceles triangle ABC with base BC where B=(3,-1) and C(2,6) find k.
12. If A=(2,4) and B=(-3,-5) and P divides externally in the ratio 3:5, find the coordinates of P.
13. If cot A = 2 and A lies in second quadrant, find sin A .
14. If α and β are the roots of the equation $x^2 - 2x+3=0$, find the value of $\frac{\alpha}{\beta}+\frac{\beta}{\alpha}$
15. Find x if
$$\begin{vmatrix} 5 & -3 & 7 \\ 2 & 1 & 2 \\ 9 & -1 & x \end{vmatrix} = 0$$
16. Express the following in the form of a+bi where a,b $\in$ R and $i = \sqrt{-1}$
$$\frac{2+3i}{i(5-2i)}$$

Section C

Question numbers from 17 to 20 carry 3 marks each.

17. Show that (3,-5),(4,5)and (11,-4)are the vertices of isosceles triangle.
18. Solve the following equations using determinants
$5x - 3y = 8$, $2x - 5y = -12$
19. Verify the following .
$$\cos 45^\circ \cos 60^\circ - \sin 45^\circ \sin 60^\circ = \frac{1-\sqrt{3}}{2\sqrt{2}}$$
20. Find tan 75° without using table.

Section D

Question number 21 carry 4 mark.

21. Solve the following equations using determinants
$x - y - z = 7$, $x + 2y + z = 15$, $-x + 4y + z = -1$

OR

21. Find all the trigonometric ratios of $\frac{5\pi}{6}$

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