NAF YAD PREPARATORY SCHOOL

2nd Semester Final Exam (2009A.Y.)

Grade 11 **Subject: Math** **Time: 2hr** **Mark: 50%**

Instruction- I Write true if the statement is correct and write false if the statement is incorrect.

1. If A and B are 2 x 2 matrices, then $|A+B|=|A|+|B|$
2. Let $A=\begin{pmatrix}1 & -2\\ 2 & -1\end{pmatrix}$, then $A^2=-3I_2$
3. The additive inverse of Z=a + bi , a , b ϵ **R** , Z ≠ 0 is Z^{-1}= a – bi
4. If Z is a complex number, then $Z \cdot \bar{Z} = |Z|^2$
5. $i^7 - i^{10}=1 - i$
6. If i and j are unit vectors $|i-j|=0$
7. If $\vec{a}+\vec{b}$ and $\vec{b}-\vec{a}$ are perpendicular, then $|\vec{a}| + |\vec{b}| =0$
8. If ∪ · ∪ > 0 ∪ ≠ 0 and ∪ is a vector
9. f (x) = cscx is an odd function.
10. Sin $\frac{\pi}{2}$ - tan (-5π)=3

Instruction – II- Choose the best answer.

11. If $\begin{vmatrix}1 & 4\\ 3x & x+22\end{vmatrix} = 0$. The value of x is

    A. 11 B. 2 C. 22 D. 4 E. None

12. Let $A=\begin{pmatrix}3 & -2\\ -1 & 3\end{pmatrix}$ and $A-B=I_2$, then $|B|$ is

    A. 6 B. 2 C. -6 D. 7 E. None

13. If $\begin{pmatrix}x & 2\\ y & x\end{pmatrix}+\begin{pmatrix}4 & -3\\ 0 & -1\end{pmatrix}=\begin{pmatrix}8-x & -1\\ 2x & 1\end{pmatrix}$, then the value of x and y is

    A. $X=\frac{1}{y}$ = -2 B. 2x=y=4 C. $\frac{1}{x}$ =y =-1 D. x=y=2 E. None

14. Let $A=\begin{pmatrix}x & -1\\ 3x & 1\end{pmatrix}$ and $|2A| = x^2$, the value of x, x ≠ 0 is

    A. 4 B. 16 C. 8 D. 2 E. None

15. If Z_1= 2+i and Z_2= 1+2i, then $Z_1 \cdot Z_2$ is equal to

    A. i – 1 B. 5i + 4 C. 5i D. 4 E. None

16. Simplifying $\left|\frac{i-1}{2+i}\right|$ gives

    A. $\frac{\sqrt{2}}{5}$ B. $\frac{\sqrt{2}}{\sqrt{5}}$ C. $\frac{5}{\sqrt{2}}$ D. $\frac{\sqrt{2}}{10}$ E. None

17. The solution set of (2x - yi) (3 + i)= 20i is

A. {(-2, 4)} B. {(1, -6)} C. {(5, 3)} D. {(-1, 1)} E. None

18. Let $Z=1+\sqrt{3}\,i$, then $|Z|$ is equal to

A. 1 B. $\sqrt{2}$ C. 2 D. $\sqrt{3}$ E. None

19. If Z=3-2i, then $Z\cdot\bar{Z}$ is equal to

A. 13 B. 5 C. 10 D. 1 E. None

20. The solution set of $x^2+2=0$ is

A. {-1, 1} B. {-i, i} C. $\{-\sqrt{2}\,i\,,\sqrt{2}\,i\}$ D. {0 , 1} E. None

21. If $|a+b|$ =5, $|a|=\sqrt{2}$ and $|b|$=1, then a · b is equal to

A. 1 B. 11 C. 4 D. 22 E. None

22. Let $\vec{U}$ =3i +2j and, $\vec{V}$ =-6i – 4j, then the angle between the two vectors is

A. $-\pi$ B. $\frac{\pi}{4}$ C. $\frac{\pi}{2}$ D. $\frac{-\pi}{6}$ E. None

23. If T ((1 , 2))= (5, 8), then T ((3, 4)) is equal to

A. (4, 3) B. (6, 10) C. (7, 10) D. (5, 6) E. None

24. The image of point p (3, 5) under the line of reflection ℓ :y=mx whose inclination is $\frac{\pi}{4}$ is

A. (3, 4) B. (5, 3) C. (4, 5) D. (4, 3) E. None

25. If the line x-y=z 2 is rotated about the origin through angle $\frac{\pi}{2}$, then its image is

A. 2x-1=y B. y=-x+2 C. y=-x+1 D. y=3x-1 E. None

26. If $y=\sin^{-1}(1/2)$, then the value of y is

A. $[\frac{-\pi}{2}, \frac{\pi}{2}]$ B. $(-\pi , \pi)$ C. $(-\infty , \infty)$ D. $[\frac{-\pi}{4}, \frac{\pi}{4}]$ E. None

27. The value of $\text{Cos}^{-1}(\sin\frac{\pi}{2})$ is

A. Π B. $\frac{3}{2}\pi$ C. $-\pi$ D. 2π E. None

28. The solution set of tan x- secx=1 is

A. $\{0, \pi\}$ B. $\{-\pi, 0\}$ C. $\{\pi\}$ D. {0} E. None

29. If $x= \sin^{-1}(\frac{1}{2})$, then the value of cos 2x is

A. $\frac{\sqrt{3}}{2}$ B. $\frac{1}{2}$ C. $\sqrt{3}$ D. 1 E. None

30. If Cos x= $\frac{-1}{2}$ and x is second quadrant, then $\tan(\frac{1}{2}x)$ is equal to

A. $-\sqrt{3}$ B. $\frac{\sqrt{2}}{2}$ C. $\frac{-1}{2}$ D. -1 E. None

Instruction–III. Give short answer

31. If $A=\begin{pmatrix} 1 & -1 & 1 \\ -1 & 0 & -1 \end{pmatrix}$ and $B=\begin{pmatrix} 2 & -1 \\ 1 & 0 \\ -1 & -2 \end{pmatrix}$ Then A.B=_____

32. Given, Z= i+1, the polar form of Z=_____

Instruction – IV- Workout, show the necessary steps

33. Find the equation of the tangent line to the circle $x^2+y^2=8$ at (-2, -2)
34. If L: AX + BY+ C=0 is translation line which takes the point (3, 5) to (-7, -9). Find equation of L.
35. If $\sin\theta = \frac{12}{13}$ and θ lies in quadrant II, Find $\csc\theta - \cot\theta$
36. Show that $\tan\theta = \frac{1-\cos 2\theta}{\sin 2\theta}$

ANSWER SHEET

NAME _____ SECTION _____ ROLL NO_____

1		11		21		31	_____
2		12		22		32	_____
3		13		23			
4		14		24			
5		15		25			
6		16		26			
7		17		27			
8		18		28			
9		19		29			
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