CET – MOCK TEST – IV

SUBJECT: MATHEMATICS

Duration: 70 min. **Max Marks:60**

1. If $\left|\frac{Z-2}{Z-(1+i)}\right|=1$ then locus of z is _____

   1) St line 2) Circle 3) Parabola 4) Ellipse

2. If $tan^{-1}(x-1)+tan^{-1}(x)+tan^{-1}(x+1)=\pi$ then x = _____

   1) 0 2) 1 3) 2 4) -1

3. If tan2x tan3x=1 then x =

   1) $\frac{n\pi}{2}+\frac{\pi}{10}$ 2) $n\pi-\frac{\pi}{10}$ 3) $\frac{n\pi}{5}+\frac{\pi}{10}$ 4) $\frac{n\pi}{5}-\frac{\pi}{10}$

4. If $1-i < \sqrt{2}e^{i\theta} < 1+i$ then $\theta \in$ _____

   1) $\left[\frac{-\pi}{4}, \frac{\pi}{4}\right]$ 2) $\left(\frac{-\pi}{4}, \frac{\pi}{4}\right)$

   3) $\left(0, \frac{\pi}{4}\right)$ 4) $\left(0, \frac{-\pi}{2}\right)$

5. If sin 4x cos 4x = ½ then x= _____

   1) $\frac{n\pi}{2}+(-1)^n\frac{\pi}{16}$ 2) $\frac{n\pi}{4}+\frac{\pi}{16}$

   3) $\frac{n\pi}{12}+(-1)^n\frac{\pi}{12}$ 4) $\frac{n\pi}{8}+(-1)^n\frac{\pi}{16}$

6. $sin^{-1}x+cos^{-1}x=\frac{\pi}{2}$ only when _____

   1) $x \leq 1$ 2) $x > 1$ 3) $|x| \leq 1$ 4) $|x| > 1$

7. If $\cos\theta+\cos2\theta+\cos3\theta=0$ then θ = _____.

   1) $n\pi \mp \frac{\pi}{4}$ 2) $n\pi \mp \frac{2\pi}{3}$ 3) $3n\pi-\frac{\pi}{4}$ 4) $n\pi \mp \frac{\pi}{2}$

8. The simplified form of $1 + \dfrac{1}{1+\dfrac{1}{1-i}}$ is _____

1) 1+i 2) 2+i 3) 2 - i 4) 1-2i

9. If $x_r = cis\dfrac{\pi}{3^r}$ then $x_1.\ x_2.\ x_3.$ ..... is -------.

1) 1 2) – 1 3) i 4) – i

10. The general solution of sin $7x \sin 5x = \sin 11\ x \sin 9x$ *is* _____

1) $x = n\pi/4$ 2) $x = n\pi/3$ 3) $x = n\pi/2$ 4) $x = n\pi$

11. If $\cos^{-1} x + \cos^{-1} y + \cos^{-1} z = 3\pi$ then $x + y + z + \dfrac{1}{1+x+y+z}$ =---

1) 3/10 2) 10/3 3) $-10/3$ 4) $-3/10$

12. If $\sin^{-1} x + 2\cos^{-1} x = \dfrac{\pi}{3}$ then x = -------

1) 1/2 2) $2/\sqrt{3}$ 3) 1 4) $\sqrt{3}/2$

13. If $x^2 + y^2 + 2gx + 2fy = 0$ and $x^2 + y^2 + 2g_1 x + 2y = 0$ touch each other then ------

1) $g_1 f_1 = g_2 f_2$ 2) $g_2 f_2 - g_2 f_1$ 3) $g_1 f_1 + g_2 f_2 = 0$ 4) $g_2 f_2 + g_1 f_1$

14. If A(2, 0), B(0, 2), C(0, 0) & D(a, 2a) are concyclic then a = -------

a) 5/6 b) 6/5 c) 2 d) -2.

15. If $x^2 + y^2 + 2x + 4y + 3=0$ and $x^2+y^2+3x-6y+k=0$ are orthogonal then k =----.

1) 10 2) 11 3) 12 4) -12

16. The Radical center of $x^2+y^2+x-y+1=0$, $x^2+y^2+x=0$ & $x^2+y^2+2y-1=0$ is __.

1) (1, 1) 2) (1, -1) 3) (-1, 1) d) (-1, -1)

17. A circle with radius = 4 units rolls over the exterior boundary of $x^2+y^2-2x-2y+1=0$. The locus of its center is _____.

1) $x^2+y^2-2x-2y-21=0$ 2) $x^2+y^2-2x-2y-23=0$

3) $x^2+y^2-2x+2y+21=0$ 4) $x^2+y^2-2x-2y+23=0$

18. $x^2+y^2+2x+2y+1=0$ & $x^2+y^2+x+y+1=0$

1) are district 2) touch each other internally

3) touch each other externally 4) cut orthogonally

19. Equation of a circle which passes through origin and has center on x+y-1=0 given that its length of tangent from (1, 2) is 1 is _____.

1) $x^2+y^2+2x=0$ 2) $x^2+y^2-2y=0$

3) $x^2+y^2+2x-2y=0$ 4) $x^2+y^2+2x+2y-1=0$

20. Vertex of $2y^2-3x+4y-1=0$ is ____.

1) (1, 1) 2) (1, -1) 3) (-1, 1) 4) (-1, -1)

21. Equation of a parabola with V(2, 1) and S(3, 1) is _____.

1) $y^2 + 4x + 2y - 9=0$ 2) $y^2 - 4x + 2y + 9 = 0$

3) $y^2 - 4x - 2y + 9=0$ 4) $y^2 - 4x - 2y - 9 = 0$

22. Focii of $\frac{(x-1)^2}{25}+\frac{(y-1)^2}{9}=1$ are ----.

1) (5, 1), (3, 1) 2) (5, 1), (-3, 1) 3) (1, 5), (1, -3) 4) (-1, -5), (1, 3)

23. If 2x+3y+k=0 is tangent to $\frac{x^2}{9}+\frac{y^2}{4}=1$ then k= ----.

1) $12\sqrt{2}$ 2) $6\sqrt{2}$ 3) $10\sqrt{2}$ 4) $\sqrt{2}$

24. If e_1 and e_2 are eccentricities of $x^2+y^2 = 8$ and $\frac{x^2}{4}-\frac{y^2}{8}=1$ then $e_1^2 - e_2^2 =$ _____.

1) -1 2) 0 3) 1 4) 2

25. The angle between asymptotes of $\frac{x^2}{16}-\frac{y^2}{9}=1$

1) $\tan^{-1}\left(\frac{7}{24}\right)$ 2) $\tan^{-1}\left(\frac{24}{7}\right)$ 3) $\pi/4$ 4) $\pi/3$

26. The total number of divisors of 222 is ____.

1) 2 2) 4 3) 6 4) 8

27. If $7/a.b$, $a, b \in z$ then _____.

1) 7/a 2) 7/b, 3) 7/a or 7/b 4) 7/a and 7/b

28. A value of x satisfying $72.182 .363 \equiv$ x(mod 8) is ------.

1) 0 2) 1 3) 3 4) 7

29. If $= \begin{bmatrix} 1 & 0 \\ 1 & 0 \end{bmatrix}$ & $B = \begin{bmatrix} 273 & 141 \\ -31.1 & \frac{5132}{9} \end{bmatrix}$ then $|A.B| =$

1) 0 2) 0 3) 1 4) 132/11

30. The value of $\begin{vmatrix} 1 & a & b+c \\ 1 & b & c+a \\ 1 & c & a+b \end{vmatrix}$ is -----.

1) 0 2) 1 3) $\sum a$ 4) abc

31. If $a_{ij} = \frac{i \times j}{3}$ *then* $\left|\left[a_{ij}\right]_{2\times 2}\right|$

1) $\frac{1}{8}$ 2) $\frac{1}{9}$ 3) $-\frac{1}{9}$ 4) $-\frac{1}{8}$

32. If $A = \begin{bmatrix} 1 & 2 & 1 \\ 2 & 1 & 1 \\ 1 & 1 & 2 \end{bmatrix}$ then A. (adj A) = -----.

1) I 2) 2I 3) 4I 4)-4I

33. If a, b, c are elements of abelian group with e as identity element then $O(aba^{-1})$ = -----

1) 0 2) o (b) 3) O (a^{-1}) 4) O (e)

34. In $(Z_7, +_7)$, $(3^{-1}+4+5^{-1})$ = -----

1) 1 2) 2 3) 3 4) 4

35. In the group $(\Re_0, *)$ where $a*b=\frac{7ab}{3}$, a solution of 3*x*2^{-1} = 1 is ----.

1) 1 2) 1/3 3) 2/3 4) 4/3

36. If in a vectorial triangle ABC a=2, b=3, c=4, then acute angle between $\vec{a}$ *and* $\vec{b}$ =------.

1) $\cos^{-1}\left(\frac{1}{4}\right)$ 2) $\cos^{-1}\left(\frac{1}{3}\right)$ 3) $\cos^{-1}\left(\frac{1}{2}\right)$ 4) $\cos^{-1}(1)$

37. If $\vec{a}=\hat{i}+\hat{j}+\hat{k};\ \vec{b}=\hat{i}-\hat{j};\ \vec{c}=\hat{k}$ then $\left|\left(\vec{a}\times\vec{b}\right)\times\vec{c}\right|$=-----.

1) 1 2) 2 3) $\sqrt{2}$ 4) $2\sqrt{2}$

38. The area of a parallelogram whose adjacent sides are $3\hat{i}-\hat{j}-\hat{k}$ & $\hat{i}+\hat{j}+2\hat{k}$ is ----- sq. units.

1) $\sqrt{6}$ 2)$6\sqrt{6}$ 3) $\sqrt{66}$ 4)$6\sqrt{66}$

39. If $2x^2+3xy+7y^2=0$ then y_2 is ------.

1) $\frac{1}{(2x-3y)^2}$ 2) $\frac{3y-2y}{(2x-3y)^3}$ 3) $\frac{-21}{(x-3y)^3}$ 4) 0

40. If $x=2\cos^{-1}\left(4t^3-3t\right)$ and y=3sin$^{-1}\left(3t-4t^3\right)$then y_1 at t=1 is …..

1) $\frac{1}{2}$ 2) $\frac{-1}{2}$ 3) $\frac{3}{2}$ 4) $\frac{-3}{2}$

41. If y= cosx cos2x cos3x then y^1 at x = $\pi/3$ is ------

1) $\frac{\sqrt{3}}{2}$ 2) $\frac{\sqrt{3}}{4}$ 3) $\frac{-\sqrt{3}}{4}$ 4) $\frac{-\sqrt{3}}{8}$

42. Maximum area of a right angled triangle of given hypotenuse = a is-----.

1) a^2 sq units 2) $\frac{a^2}{2}$ sq units 3) $\frac{a^2}{3}$ sq units 4) $\frac{a^2}{4}$ sq units

43. The point on to $y=\left(\frac{x^3}{3}\frac{-3x}{2}+2x-2\right)$ at which tangent is parallel to x axis is----

1) $\left(1,-\frac{7}{6}\right)$ 2) $\left(1,\frac{7}{6}\right)$ 3) $\left(-1,\frac{7}{6}\right)$ 4) $(-1,-6)$

44. At any point on the curve $x^3y^2=10$ the product of lengths of sub tangents varies directly as…… at that point

1) x 2) x^2 3) x^3 4) $\frac{1}{x^3}$

45. $\int \sin x(1+\cos x)^9\,dx =$…… +c

1) $(1+\cos x)^{10}$ 2) $-\frac{(1+\cos x)^{10}}{10}$ 3) $\left(-1+\frac{\cos x}{10}\right)^{10}$ 4) $9(\cos x-1)^8$

46. $\int e^x\left(\frac{1-\sin x}{1-\cos x}\right)dx =$……. + c

1) $e^x \cot x/2$ 2) $e^x \tan x/2$ 3) $-e^x \cot x/2$ 4) $-e^x \tan x/2$

47. $2\int_0^{\pi/2} \log\tan\theta\,d\theta+\int_0^{\pi/2} \log\cot\theta\,d\theta =$……

1)2 2) 3 3) 1 4) 0

48. The general solution of $\frac{dy}{dx}=1+x^2+y^2+x^2y^2$ is……

1) $\tan^{-1} y = x-x^2/2+c$ 2) $\tan^{-1} y-c = x-x^3/2$

3) $x-\tan^{-1} y = x^3/3+c$ 4) $3x+\tan^{-1} y = x^3+c$

49. If α and β are the roots of $ax^2+bx+c=0$ and $bx^2+cx+a=0$ then…..

1) $b^3=c$ 2) $b^3=c^2$ 3) $b^3=c^3$ 4) $b^3=2c^3$

50. The ratio of 12th term and 10th terms in $(1+x)^{25}$ is $k.x^{\alpha}$ where k and α are …..

1) $\frac{24}{11},1$ 2) $\frac{24}{11},2$ 3) $\frac{11}{24},1$ 4) $\frac{11}{24},3$

51. The domain of $y=\sin^{-1}\log\left(\frac{1+x}{1-x}\right)$ is----

1) $\left[-\frac{1}{e},-\frac{1}{e}\right]$ 2) $\left[\frac{1+e}{e},\frac{1-e}{e}\right]$ 3) $\left[\frac{1-e}{1+e},\frac{1}{e}\right]$ 4) $\left[\frac{1-e}{1+e},\frac{e-1}{1+e}\right]$

52. The negation of $p\Lambda q \to (\sim p \vee \sim q)$ is …..

1) $(p\Lambda q) \to \sim p\Lambda q$ 2) $(p\Lambda q)\Lambda(p\Lambda q)$

3) $\sim(p \vee q) \to (p\Lambda q)$ 4) $\sim(p\Lambda q) \to (p \vee q)$

53. A straight line passes through the inter section of $2x+3y-5=0$ and $x+y-2=0$. If its y intercept is-3 then it's equation is…..

1) $x-2y-3=0$ 2) $x+2y-3=0$ 3) $2x+y-3=0$ 4) $2x-y+3=0$

54. If $2x^2+xy+y^2-2x-4y+k=0$ represent a pair of straight line then k=----

1) 1 2)2 3)3 4)4

55. If in a triangle ABC, a=2,B=30,c=45^0 then b=------

1) $\sqrt{3}-1$ 2) $\frac{\sqrt{3}-1}{2}$ 3) $\frac{\sqrt{3}-1}{\sqrt{2}}$ 4) $\frac{\sqrt{3}+1}{2\sqrt{2}}$

56. If in a triangle ABC $a\cos^2\frac{c}{2}+c\cos^2\frac{a}{2}=\frac{3b}{2}$ then a, b, c are in -----

1)AP 2)GP 3)HP 4)A-G-Progression

57. $\lim_{n\to\infty} n\left(\sqrt{n^2+1}-n\right)$ = -----

1) 0 2) 1 3) $\frac{1}{2}$ 4) ∞

58. $\lim_{x\to 0}\left[\frac{\log(3+x)-\log(3-x)}{x}\right]$=-----

1) 1 2) $\frac{1}{2}$ 3) $\frac{1}{3}$ 4) $\frac{2}{3}$

59. Define $f: R \to R$ as $f(x)=\begin{cases}1-x, & x<1\\ 1, & x=1\\ 1+x, & x>1\end{cases}$ then f is----- at x=1

1) Continuous 2) discontinuous of 1st kind

3) discontinuous 2nd kind 4) discontinuous of 3rd kind

60. If $f(x)=\frac{\sqrt{2+\cos x}-1}{(\pi-x)^2}$ is continuous at $x=\pi$ then $f(\pi)$=-----

1) $\frac{-1}{4}$ 2) 0 3) $\frac{1}{4}$ 4)1

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