[redacted]

MATHS-I

CONTENT

PREVIOUS ECET BITS

1. MATRICES

2008

01. If $\begin{vmatrix} 1+x & 1-x & 1-x \\ 1-x & 1+x & 1-x \\ 1-x & 1-x & 1+x \end{vmatrix} = 0$,then $x =$

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

02. If $\begin{bmatrix} x & 1 & 1 \\ 2 & 3 & 4 \\ 1 & 1 & 1 \end{bmatrix}$ is a singular matrix, then the value of x is

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

03. For the system of equation $x+2y+3z=6$, $2x+y+2z=5, 3x+3y+5z=12$

1) $x=1, y=1, z=1$ is the only solution
2) No solution exists
3) Infinitely many solutions exist
4) $x=2, y=1, z=0$ is the only solution

2009

04. The minor of -2 in $\begin{bmatrix} 2 & 1 & 1 \\ 1 & -2 & -3 \\ 3 & 2 & 4 \end{bmatrix}$ is

1) -5 2) 5 3) 11 4) -2

05. If $A = \begin{bmatrix} 1 & 1 & 0 \\ 0 & 1 & 0 \\ 0 & 3 & 2 \end{bmatrix}$, then det A is

1) -2 2) +2 3) 0 4) 6

06. The solution to system of linear equations $x-3y+2z=8, x+4y+z=5, 4x+2y-9z=2$ by Cramer's rule is

1) $x=7, y=-3, z=-4$
2) $x=1, y=2, z=3$
3) $x=7, y=3, z=4$
4) $x=-1, y=-2, z=-3$

2010

07. $\begin{vmatrix} y+z & x & y \\ y & z+x & y \\ z & z & x+y \end{vmatrix} =$

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

08. The determinant of an orthogonal matrix is

1) ± 1 2) <1 3) 0 4) >1

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

1) A 2) A^T 3) $2A^T$ 4) $3A^T$

2011

10. If $F(\alpha) = \begin{vmatrix} Cos\alpha & -Sin\alpha & 0 \\ Sin\alpha & Cos\alpha & 0 \\ 0 & 0 & 1 \end{vmatrix}$; $F(x), F(y) =$

1) $F(x-y)$ 2) $F(xy)$
3) $F(x+y)$ 4) $F(x^2+y^2)$

11. If $A = \begin{bmatrix} 1 & -1 & 1 \\ 2 & -1 & 0 \\ 1 & 0 & 0 \end{bmatrix}$ then $A^2 =$

1) A^T 2) A^{-1} 3) I 4) A^3

12. If $A = \begin{bmatrix} 5 & x \\ y & 0 \end{bmatrix}$ and $A = A^T$ then

1) $x=0, y=5$ 2) $x+y=5$
3) $x=y$ 4) $x^2=1$

13. If $A=\begin{bmatrix}0 & -1\\ 1 & 0\end{bmatrix}$ and $B=\begin{bmatrix}0 & i\\ i & 0\end{bmatrix}$ then

1) $A^2+B^2=I$ 2) $A^2=B^2=-I$
3) $A^2=I, B^2=-I$ 4) $A^2=-I, B^2=I$

14. If $a\neq b\neq c$ and $\begin{vmatrix}a & a^2 & a^3 & -1\\ b & b^2 & b^3 & -1\\ c & c^2 & c^3 & -1\end{vmatrix}=0$ then

1) $a+b+c=0$ 2) $abc=1$
3) $a+b+c=1$ 4) $ab+bc+ca=0$

15. If one root of the equation $\begin{vmatrix}7 & 6 & x\\ 2 & x & 2\\ x & 3 & 7\end{vmatrix}=7$ is $x=-9$. The other roots are

1) $(2,6)$ 2) $(3,6)$ 3) $(2,7)$ 4) $(3,7)$

2012

16. If $A=\begin{bmatrix}3 & 0 & 0\\ 0 & 3 & 0\\ 0 & 0 & 3\end{bmatrix}$ then $A^4=$

1) 3I 2) 9I
3) 27I 4) 81I

17. If $A=\begin{bmatrix}0 & 2 & 1\\ -2 & 0 & -2\\ -1 & x & 0\end{bmatrix}$ is a skew symmetric matrix, then the value of x is

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

18. What is the number of all possible matrices with each entry as 0 or 1 if the order of matrices is

1) 64 2) 268
3) 512 4) 256

19. If $A=\begin{bmatrix}1 & i & -i\\ i & -i & 1\\ -i & 1 & i\end{bmatrix}$ then $|A|=$

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

20. The solution of a system of linear equations $2x-y+3z=9,\ x+y+z,\ x-y+z=2$ is

1) $x=-1, y=-2, z=-3$
2) $x=3, y=2, z=1$ 3) $x=2, y=1, z=3$
4) $x=1, y=2, z=3$

2013

21. Given a matrix $A=\begin{bmatrix}1 & 0 & 0\\ 2 & 3 & 4\\ 5 & -6 & x\end{bmatrix}$ and if det (A) $=48$, the value of x is

1) 0 2) 4
3) 7 4) 8

22. If A and B are symmetric matrices of same order then $(AB^T)^T=$

1) AB 2) BA
3) 1 4) -AB

23. Which of the following statements is FALSE

1) In a determinant the numbers of rows must be equal to the number of columns
2) In a determinant interchange of rows into columns does not alter the value of the determinant
3) In general, interchange of rows into columns and vice-versa produces the same matrix
4) A determinant can be reduced to a single number

24. If $A=\begin{bmatrix}2 & 0\\ 0 & 2\end{bmatrix}$, then $A^5=$

1) 5A 2) 32
3) 16A 4) 32A

25. If the matrix A is such that $A\begin{bmatrix}-1 & 2\\ 3 & 1\end{bmatrix}=\begin{bmatrix}-4 & 1\\ 7 & 7\end{bmatrix}$, then $A=$

1) $\begin{bmatrix}1 & -1\\ 2 & 3\end{bmatrix}$ 2) $\begin{bmatrix}1 & 1\\ -2 & 3\end{bmatrix}$

3) $\begin{bmatrix}3 & 1\\ -2 & 1\end{bmatrix}$ 4) $\begin{bmatrix}-1 & 1\\ 2 & 3\end{bmatrix}$

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26. The adjoint of $A=\begin{pmatrix}1 & 4 & -2\\ -2 & -5 & 4\\ 1 & -2 & 1\end{pmatrix}$ is

1) $\begin{pmatrix}1 & 4 & -2\\ -2 & -5 & 4\\ 1 & -2 & 1\end{pmatrix}$ 2) $\begin{pmatrix}1 & 4 & -2\\ -2 & -5 & -4\\ 1 & -2 & 1\end{pmatrix}$

3) $\begin{pmatrix}3 & 0 & 6\\ 6 & 3 & 0\\ 9 & 6 & 3\end{pmatrix}$ 4) $\begin{pmatrix}3 & 2 & 1\\ 4 & 1 & -1\\ 0 & 3 & 4\end{pmatrix}$

27. If A is a square matrix of order 3 then $(\text{adj}\,A)\cdot A=$

1) $A\cdot(\text{adj}\,A)$ 2) $A\times(\text{adj}\,A)$

3) $A-(\text{adj}\,A)$ 4) $A+(\text{adj}\,A)$

28. The inverse of $A=\begin{pmatrix}2 & 3\\ 2 & 5\end{pmatrix}$ is

1) $\begin{pmatrix}\frac{5}{4} & -\frac{3}{4}\\ \frac{1}{2} & \frac{1}{2}\end{pmatrix}$ 2) $\begin{pmatrix}\frac{5}{4} & \frac{3}{4}\\ -\frac{1}{2} & \frac{1}{2}\end{pmatrix}$

3) $\begin{pmatrix}\frac{5}{4} & -\frac{5}{4}\\ -\frac{1}{2} & \frac{1}{2}\end{pmatrix}$ 4) $\begin{pmatrix}\frac{5}{4} & -\frac{3}{4}\\ -\frac{1}{2} & \frac{1}{2}\end{pmatrix}$

29. If $A=\begin{pmatrix}3 & 2 & x\\ 4 & 1 & -1\\ 0 & 3 & 4\end{pmatrix}$ is a singular matrix then the value of x is

1) $\frac{11}{12}$ 2) $-\frac{11}{12}$

3) $\frac{13}{12}$ 4) $\frac{5}{4}$

30. If $A=\begin{pmatrix}3 & 1\\ -1 & 2\end{pmatrix}$ then $A^2-5A+7I$ is

1) $\begin{pmatrix}1 & 0\\ 0 & 1\end{pmatrix}$ 2) $\begin{pmatrix}0 & 3\\ 2 & 0\end{pmatrix}$

3) $\begin{pmatrix}0 & 0\\ 0 & 0\end{pmatrix}$ 4) $\begin{pmatrix}2 & 3\\ 2 & 5\end{pmatrix}$

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31. Let $M=(a_{ij})$ be a 10×10 matrix such that $a_{ij}=\begin{cases}1, & \text{if } i+j=11\\ 0, & \text{otherwise}\end{cases}$. Then, the determinnat of M is _____

1) 0 2) 1 3) -1 4) 11

32. Let A and B be two square matrices of order n. If $AB=A$, $BA=B$ then $A^2+B^2=$ ___

1) AB 2) $A-B$ 3) 0 4) $A+B$

33. Consider the system of linear equations $x+y+z=3$, $x-y-z=4$, $x-5y+\alpha z=6$. Then, the value of α for which this sytem has an infinite number of solutions is _____.

1) -5 2) 5 3) 3 4) 1

34. If $A(\alpha,\beta)=\begin{pmatrix}\cos\alpha & \sin\alpha & 0\\ -\sin\alpha & \cos\alpha & 0\\ 0 & 0 & e^{\beta}\end{pmatrix}$, then the inverseof the matrix $A(\alpha,\beta)$ is _____

1) $A(\alpha,\beta)$ 2) $A(\alpha,-\beta)$

3) $A(-\alpha,-\beta)$ 4) $A(-\alpha,\beta)$

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35. If $A=\begin{bmatrix}3 & 1\\ 1 & 4\end{bmatrix}$ and $A^2-kA-4I_2=0$ then $k=$

1) 1 2) 2 3) –2 4) –1

36. If $A=\begin{bmatrix}0 & 2 & 1\\ -2 & 0 & -2\\ -1 & x & 0\end{bmatrix}$ is a skew-symmetric matrix, then x is

1) 0 2) 1 3) 2 4) –2

37. If $a+b+c=0$, one root of $\begin{vmatrix}a-x & c & b\\ c & b-x & a\\ b & a & c-x\end{vmatrix}=0$ is

1) $x=0$ 2) $x=1$
3) $x=2$ 4) $x=a^2+b^2+c^2$

38. The co-factors of the elements 2, –5 in the matrix $\begin{pmatrix}-1 & 0 & 5\\ 1 & 2 & -2\\ -4 & -5 & 3\end{pmatrix}$ is

1) 16, 3 2) 17, –3
3) 17, 3 4) –17, –3

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39. If $P=\begin{bmatrix}1 & 2 & 3\\ 2 & 3 & 4\\ 0 & 1 & 2\end{bmatrix}=A+B$, where A is symmetric and B is skew symmetric, then $B=$

1) $\begin{bmatrix}2 & 4 & 3\\ -4 & 6 & 5\\ -3 & -5 & 4\end{bmatrix}$ 2) $\begin{bmatrix}0 & 0 & 3\\ 4 & 0 & 3\\ -3 & -3 & 0\end{bmatrix}$

3) $\begin{bmatrix}2 & 3 & 1\\ -3 & 6 & 5\\ -1 & -5 & 4\end{bmatrix}$ 4) $\begin{bmatrix}1 & 1 & 1\\ -1 & 0 & 1\\ -1 & -1 & 0\end{bmatrix}$

40. Let $A=\begin{bmatrix}1 & 2 & 3\\ 2 & 3 & 4\\ 0 & 1 & 2\end{bmatrix}$, $C=\begin{bmatrix}3 & 0 & 0\\ 0 & 3 & 0\\ 0 & 0 & 3\end{bmatrix}$, $E=\begin{bmatrix}0 & 1 & 6\\ -1 & 0 & 8\\ -6 & -8 & 0\end{bmatrix}$, $F=\begin{bmatrix}1 & 6 & 0\\ 8 & 0 & -8\\ 0 & -6 & -1\end{bmatrix}$. The non skew symmetric matrix having rank 2 is

1) E 2) F 3) A 4) C

41. If $A=\begin{bmatrix}1 & 2 & 3\\ 2 & 3 & 4\\ 0 & 1 & 2\end{bmatrix}$, $B=\begin{bmatrix}1 & w & w^2\\ w & w^2 & 1\\ w^2 & 1 & w\end{bmatrix}$, where w is complex cube root of unity, $C=\begin{bmatrix}3 & 0 & 0\\ 0 & 3 & 0\\ 0 & 0 & 3\end{bmatrix}$, $D=\begin{bmatrix}0 & 0 & 3\\ 0 & 3 & 0\\ 3 & 0 & 0\end{bmatrix}$, then the matrix having rank 1 is

1) A 2) D 3) B 4) C

42. If $A=(a_{ij})_{3\times3}$ is real skew symmetric matrix, then $a_{11}+a_{22}+a_{33}+|A|=$

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

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43. $A=\begin{bmatrix}1 & 2\\ 3 & 4\end{bmatrix}$ and $B=\begin{bmatrix}5 & 6\\ 7 & 8\end{bmatrix}$ then $AB^T=$

1) $\begin{bmatrix}19 & 22\\ 43 & 50\end{bmatrix}$ 2) $\begin{bmatrix}17 & 23\\ 39 & 53\end{bmatrix}$

3) $\begin{bmatrix}26 & 38\\ 30 & 44\end{bmatrix}$ 4) $\begin{bmatrix}19 & 23\\ 30 & 53\end{bmatrix}$

44. If A is any square matrix, then $A-A^T$ is
1) a null matrix
2) an identity matrix
3) a symmetric matrix
4) a skew-symmetric matrix

45. If $\begin{vmatrix}4 & -5 & 6\\ 7 & x & 8\\ -1 & 2 & -3\end{vmatrix}=0$, then, $x=$

1) 0 2) $-\frac{55}{6}$ 3) $-\frac{15}{2}$ 4) 1

46. If $A=\begin{bmatrix}3 & -5\\ -7 & 2\end{bmatrix}$, $I=\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix}$ and B is a square matrix such that $AB=I$, then $B=$

1) $\begin{bmatrix}2 & 5\\ 7 & 3\end{bmatrix}$ 2) $\begin{bmatrix}-2 & 5\\ 7 & -3\end{bmatrix}$

3) $-\frac{1}{29}\begin{bmatrix}2 & 5\\ 7 & 3\end{bmatrix}$ 4) $-\frac{1}{29}\begin{bmatrix}-2 & 5\\ 7 & -3\end{bmatrix}$

47. If $x=\alpha$, $y=\beta$, $z=\gamma$ is the unique solution of the system of simultaneous linear equations $x-2y+z=5$, $2x+y-2z=-3$ and $x-2y+3z=9$, then $\gamma=$

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

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48. If $A=\begin{bmatrix}1 & 0 & 0\\ 1 & 0 & 1\\ 0 & 1 & 0\end{bmatrix}$, then $A^{50}=$

1) $\begin{bmatrix}1 & 0 & 0\\ 0 & 1 & 0\\ 0 & 0 & 1\end{bmatrix}$ 2) $\begin{bmatrix}1 & 0 & 0\\ 25 & 1 & 0\\ 25 & 0 & 1\end{bmatrix}$

3) $\begin{bmatrix}1 & 0 & 0\\ 24 & 1 & 0\\ 24 & 0 & 1\end{bmatrix}$ 4) $\begin{bmatrix}1 & 0 & 0\\ 50 & 1 & 0\\ 50 & 0 & 1\end{bmatrix}$

49. If $a+b+c=0$, $\begin{vmatrix}ax & by & cz\\ bz & cx & ay\\ cy & az & bx\end{vmatrix}=k\begin{vmatrix}x & y & z\\ z & x & y\\ y & z & x\end{vmatrix}$

$=abc\left(x^3+y^3+z^3\right)-xyz\left(a^3+b^3+c^3\right)$, then $k=$

1) xyz 2) abc

3) $x+y+z$ 4) 0

50. Consider the statements with reference to the 3×3 matrices, A and B and k is a constant

I) $A=kB\Rightarrow|A|=k|B|$

II) $adj(AB)=adj(B)adj(A)$

III) for a matrix C, if $A=BC\Rightarrow C=B^{-1}A$

Which of the above statements are correct?

1) only I and II are correct

2) only II is correct

3) only III is correct

4) only II and III are correct

51. If the solution of the system of equations $x-y+z=4$, $2x+y-3z=0$, $x+y+z=2$ is (x,y,z), then $x+y+z=$

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

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52. If $A=\begin{bmatrix}\cos\theta & -\sin\theta\\ \sin\theta & \cos\theta\end{bmatrix}$, then $A^T+A=I_2$ if

1) $\theta=n\pi, n\in Z$

2) $\theta=(2n+1)\frac{\pi}{2}, n\in Z$

3) $\theta=2n\pi\pm\frac{\pi}{3}, n\in Z$

4) $\theta=(2n\pi+1)\frac{\pi}{4}, n\in Z$

53. If for the matrix A. $A^3=I$ then $A^{-1}=$

1) A^2 2) A^3 3) A 4) A^4

54. The value of λ for which the system of equations $x+y+z=6$, $x+2y+3z=10$, $x+2y+\lambda z=12$ is inconsistent is

1) $\lambda=1$ 2) $\lambda=2$ 3) $\lambda=-2$ 4) $\lambda=3$

55. If $A=\begin{bmatrix}a & 0 & 0\\ 0 & a & 0\\ 0 & 0 & a\end{bmatrix}$ then the value of $|adj\ A|$ is

1) a^{27} 2) a^9 3) a^6 4) a^2

56. If $A+2B=\begin{bmatrix}1 & 2 & 0\\ 6 & -3 & 3\\ 5 & 3 & 1\end{bmatrix}$ and

$2A-B=\begin{bmatrix}2 & -1 & 5\\ 2 & -1 & 6\\ 0 & 1 & 2\end{bmatrix}$ then $tr(A)-tr(B)$ value equal to

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

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57. If p, q and r 3 real numbers satisfying the matrix equation, $\begin{bmatrix}p & q & r\end{bmatrix}\begin{bmatrix}3 & 4 & 1\\ 3 & 2 & 3\\ 2 & 0 & 2\end{bmatrix}=\begin{bmatrix}3 & 0 & 1\end{bmatrix}$ then $2p+q-r$ is equal to

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

58. If $f(\alpha)=\begin{bmatrix}\cos\alpha & \sin\alpha\\ -\sin\alpha & \cos\alpha\end{bmatrix}$ then $f(\alpha)f(\beta)=$

1) $f(\alpha)-f(\beta)$ 2) $f(\alpha)+f(\beta)$

3) $f(\alpha-\beta)$ 4) $f(\alpha+\beta)$

59. The value of "x" which satisfies the following equations $x+y+z=9$, $2z+5y+7z=52$ and $2x+y-z=0$ is

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

60. The solutions of equation $\begin{vmatrix}x & 2 & -1\\ 2 & 5 & x\\ -1 & 2 & x\end{vmatrix}=0$ are

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

PREVIOUS ECET BITS KEY

01) 4	02) 4	03) 3	04) 2	05) 2
06) 1	07) 4	08) 1	09) 4	10) 3
11) 2	12) 3	13) 2	14) 1	15) 3
16) 4	17) 2	18) 3	19) 2	20) 4
21) 4	22) 2	23) 3	24) 3	25) 1
26) 3	27) 1	28) 4	29) 1	30) 3
31) 3	32) 4	33) 1	34) 3	35)
36) 3	37) 1	38) 3	39) 4	40) 2,3
41) 3	42) 1	43) 2	44) 4	45) 3
46) 3	47) 1	48) 2	49) 2	50) 2
51) 3	52) 3	53) 1	54) 4	55) 3
56) 3	57) 1	58) 4	59) 2	60) 1

2. PARTIAL FRACTIONS

2018

1. If $\frac{3x+7}{x^2-3x+2}=\frac{K}{x-2}-\frac{10}{x-1}$ then K =

1) 13 2) 10 3) 5 4) 0

2009

2. If $\frac{2x+5}{(x-3)^2}=\frac{A}{x-3}+\frac{B}{(x-3)^2}$ then A+B is

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

3. If $\frac{2x+5}{(x+1)^4}=\frac{A}{(x+1)^3}+\frac{B}{(x+1)^4}$ then (A, B) =

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

4. If $\frac{1}{x^2+a^2}=\frac{A}{x+ai}+\frac{B}{x-ai}$ then A = _____, B = _____

1) $\frac{1}{2ai},-\frac{1}{2ai}$ 2) $-\frac{1}{2ai},\frac{1}{2ai}$

3) $\frac{1}{ai},-\frac{1}{ai}$ 4) $-\frac{1}{ai},\frac{1}{ai}$

5. If $\frac{2x+4}{(x-1)^3}=\frac{A_1}{(x-1)}+\frac{A_2}{(x-1)^2}+\frac{A_3}{(x-1)^3}$ then $\sum_{i=1}^{3}A_i$ is equal to

1) A_2 2) $2A_2$ 3) $4A_2$ 4) $4A_1$

2013

6. If $\frac{10}{(x-3)(x^2+1)}=\frac{1}{x-3}=\frac{Bx+3}{x^2+1}$ then B

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

7. If $\frac{x^2+13x+15}{(2x+3)(x+3)^2} = \frac{A}{2x+3} + \frac{B}{x+3} + \frac{C}{(x+3)^2}$ then C =

1) 10 2) 5 3) 3 4) 1

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8. If $\frac{1-x+6x^2}{x-x^3} = \frac{1}{x} + \frac{3}{1-x} + \frac{A}{1+x}$ then $A =$

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

9. If $\frac{x^3}{(x+2)^2(x^2+2)} = \frac{10}{9(x+2)^2} - \frac{4}{3(x+2)^2} - \frac{Ax+4}{9(x^2+2)}$ then A =

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

2015 - TS ECET

10. Partial fractions of $\frac{x-1}{(x-2)(x-3)}$ is:

1) $\frac{2}{x-3} + \frac{1}{x-2}$ 2) $\frac{1}{x-3} + \frac{1}{x-2}$

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

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11. Resolve $\frac{3x+7}{(x-1)(x-2)}$ into partial fractions

1) $\frac{12}{(x-2)} - \frac{10}{(x-1)}$

2) $\frac{13}{(x-2)} - \frac{10}{(x-1)}$

3) $\frac{13}{(x-5)} - \frac{10}{(x-1)}$

4) $\frac{13}{(x-2)} - \frac{10}{(x-7)}$

12. Resolve $\frac{5x^2+1}{x^2-1}$ into partial fractions

1) $\frac{12}{(x-2)} - \frac{10}{(x-1)}$

2) $\frac{13}{(x-2)} - \frac{10}{(x-1)}$

3) $\frac{13}{(x-5)} - \frac{10}{(x-1)}$

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

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13. The rational fraction $\frac{x^2+1}{(x^2+4)(x-2)}$ is equal to _____

1) $\frac{3x+6}{8(x^2+4)} + \frac{5}{4(x-2)}$

2) $\frac{3x+6}{4(x^2+4)} + \frac{5}{8(x-2)}$

3) $\frac{3x+6}{8(x^2+4)} + \frac{5}{8(x-2)}$

4) $\frac{3x+6}{(x^2+4)} + \frac{5}{(x-2)}$

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14. The solution of a system of linear equations $2x-y+3z=9$, $x+y+z=6$, $x-y+z=2$ is

1) $x=-1, y=-2, z=-3$

2) $x=-1, y=-2, z=3$

3) $x=-1, y=2, z=-3$

4) $x=1, y=2, z=3$

15. If $\frac{2x++4}{(x-1)^3} = \frac{S_1}{(x-1)} + \frac{S_2}{(x-1)^2} + \frac{S_3}{(x-1)^3}$ then

$\sum_{j=1}^{3} S_j$ is equal to

1) S_2 2) $2S_2$ 3) $4S_2$ 4) $4S_1$

16. If $\frac{3x^3-2x^2-1}{x^4+x^2+1}=\frac{Ax+B}{x^2+x+1}+\frac{Cx+D}{x^2+kx+1}$ then $k=$

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

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17. If $\frac{x^2+13x+15}{(2x+3)(x+3)^2}=\frac{A}{2x+3}+\frac{B}{x+3}+\frac{C}{(x+3)^2}$ then $6A+9B+2C=$

1) 0 2) 1 3) 13 4) 15

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18. If $\frac{4x-22}{3x^2+2x-8}=\frac{A}{x+2}+\frac{B}{3x-4}$, then $A+B=$

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

19. If $\frac{4-7x^2}{3x^3+6x^2}=\frac{A}{x}+\frac{Bx+c}{x^2+2}$, then $A+C=$

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

2021 - TS ECET

20. If $\frac{3x-2}{(x+1)(2x^2+3)}=\frac{A}{x+1}-\frac{Bx+C}{2x^2+3}$, then $A+B+C=$

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

2022 - AP ECET

21. $\frac{2x+3}{(x+1)(x-3)}=\frac{a}{(x+1)}+\frac{b}{(x-3)}$ then $2a+3b=$

1) 14 2) 12 3) $\frac{25}{4}$ 4) -12

22. The number of partial fractions of $\frac{3x^2+70x+93}{(x-1)^4}$ is

1) 3 2) 4 3) 5 4) 2

2022 - AP ECET

23. $\frac{x+1}{(2x-a)(x+2)}=\frac{3}{2x-a}+\frac{b}{x+2}$ then $(a,b)=$

1) $(1,5)$ 2) $(5,1)$

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

24. If $\frac{x^2+x+1}{x^2+2x+1}=A+\frac{B}{(x+1)}+\frac{C}{(x+1)^2}$ then $A-B=$

1) $4C$ 2) $4C+1$ 3) $2C$ 4) $3C$

PREVIOUS ECET BITS KEY

01) 1	02) 3	03) 3	04) 2	05) 3
06) 2	07) 2	08) 3	09) 2	10) 4
11) 2	12) 4	13) 3	14) 4	15) 3
16) 3	17) 3	18) 1	19) 2	20) 2
21) 3	22) 1	23) 4	24) 3	

3. TRIGONOMETY

2008

1. If $\cot\theta=-\frac{24}{7}$ and 'θ' lies in fourth quadrant them $\sin\theta$

1) $\frac{7}{25}$ 2) $\frac{2}{25}$ 3) $-\frac{3}{25}$ 4) $-\frac{7}{25}$

2. $\tan1^\circ.\tan2^\circ.\tan3^\circ.....\tan89^\circ=$

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

3. The value of $\cos255^\circ+\sin165^\circ$ is

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

4. If $\cos\theta = -\frac{3}{5}, \theta \in$ III, then the value of $\tan\frac{\theta}{2} =$

1) $\frac{2}{5}$ 2) 2 3) $\frac{5}{2}$ 4) $\frac{5}{3}$

5. $\sin 75° =$

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

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

6. $\cos 40° + \cos 80° + \cos 160° + \cos 240° =$

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

7. $\frac{\sin 65° + \sin 25°}{\cos 65° + \cos 25°} =$

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

8. $\Sigma\frac{\sin(A-B)}{\cos A \cos B} =$

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

9. The period of the function $\tan(3x+5)$ is

1) $\frac{2\pi}{3}$ 2) $\frac{\pi}{6}$ 3) π 4) $\frac{\pi}{3}$

10. If θ is an acute angle and $\tan\theta = \frac{1}{\sqrt{7}}$ then

$\frac{\text{cosec}^2\theta - \sec^2\theta}{\text{cosec}^2\theta + \sec^2\theta} =$

1) $\frac{3}{4}$ 2) $\frac{1}{2}$ 3)2 4) $\frac{5}{4}$

11. $\frac{\sin\theta + \sin 2\theta}{1 + \cos\theta + \cos 2\theta} =$

1) $\sin\theta$ 2) $\cos\theta$ 3) $\tan\theta$ 4) $\cot\theta$

12. In $\Delta ABC, \Sigma\cos\frac{A}{2}\cos\left(\frac{B-C}{2}\right) =$

1) $2\cos\frac{A}{2}\cos\frac{B}{2}\cos\frac{C}{2}$

2) $4\cos\frac{A}{2}\cos\frac{B}{2}\cos\frac{C}{2}$

3) $2\sin\frac{A}{2}\sin\frac{B}{2}\sin\frac{C}{2}$

4) $4\sin\frac{A}{2}\sin\frac{B}{2}\sin\frac{C}{2}$

13. If $a = 5, b = 13, c = 13$ then $\tan\left(\frac{A}{2}\right) =$

1) $\frac{1}{5}$ 2) $\frac{2}{5}$ 3) $\frac{3}{5}$ 4) $\frac{4}{5}$

14. $\tan\left(\frac{\pi}{4}+\theta\right)\tan\left(\frac{3\pi}{4}+\theta\right) =$

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

15. The value of $\log_e i =$

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

16. The multiplicative inverse of $\frac{3+4i}{25}$ is

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

17. The conjugate of $\frac{2+3i}{1+2i}$ is

1) $\frac{8+i}{5}$ 2) $\frac{8-i}{5}$ 3) $\frac{2+3i}{5}$ 4) $\frac{2-3i}{5}$

18. The conjugate of $\frac{-5i}{7+i}$ is

1) $\frac{1+7i}{10}$ 2) $\frac{1-7i}{10}$ 3) $\frac{-1+7i}{10}$ 4) $\frac{-1-7i}{10}$

19. If n is a positive integer which is a multiple of 3, then $1 + \omega^n + \omega^{2n} =$

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

20. If $\tan\theta = \frac{a}{b}$ then $\frac{a\sin\theta + b\cos\theta}{a\sin\theta - b\cos\theta} =$

1) $\frac{a^2-b^2}{a^2+b^2}$ 2) $\frac{-a^2+b^2}{a^2-b^2}$

3) $\frac{a^2+b^2}{a^2-b^2}$ 4) $\frac{-a^2-b^2}{a^2+b^2}$

21. The value of $\cot+\tan(180°+A)+\tan(90°+A)+\tan(360°-A)=$

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

22. If $\tan\theta=\frac{1}{2}$ then $\cos 2\theta=$

1) $\frac{3}{5}$ 2) $\frac{5}{3}$ 3) $-\frac{3}{5}$ 4) $-\frac{5}{3}$

23. If $x=a\cos 2\theta\sin\theta$, $y=\sin 2\theta\cos\theta$ then $\frac{(x^2+y^2)^3}{x^2y^2}=$

1) a^2 2) a^2 3) a^4 4) a^5

24. The principal value of argument of $-\sqrt{3}+i$ is

1) $\frac{2\pi}{3}$ 2) $\frac{4\pi}{3}$ 3) $\frac{\pi}{3}$ 4) $\frac{5\pi}{6}$

25. $(\omega^2+\omega-1)^3(\omega^2-\omega+1)^3=$

1) 44 2) 54 3) 64 4) 74

26. If $\tan A=\frac{1}{2}$, $\tan B=\frac{1}{3}$ then $\cos 2A-\sin 2B=$

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

27. $\sin 21^0\cos 9°-\cos 84°\cos 6°=$

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

28. The general solution of $\tan^2\theta=3$ is

1) $n\pi+(-1)^n\frac{\pi}{3}$ 2) $2n\pi\pm\frac{\pi}{3}$

3) $n\pi\pm\frac{\pi}{3}$ 4) $2n\pi+(-1)^n\frac{\pi}{3}$

29. In ΔABC, if a =3, b=4, sinA=$\frac{3}{4}$ then $\angle B$

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

30. $\cos\left[\sin^{-1}\left(\frac{-4}{5}\right)-\cos^{-1}\left(\frac{4}{5}\right)\right]=$

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

31. The polar forms of 1+i is

1) $\cos\frac{\pi}{4}+i\sin\frac{\pi}{2}$ 2) $\cos\frac{\pi}{4}-i\sin\frac{\pi}{2}$

3) $\sqrt{2}\left(\cos\frac{\pi}{4}+i\sin\frac{\pi}{4}\right)$

4) $\sqrt{2}\left(\cos\frac{\pi}{4}-i\sin\frac{\pi}{4}\right)$

32. If $\left(\sqrt{3}+i\right)^{100}=2^{99}(a+ib)$ then a^2+b^2

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

33. If the angles A, B, C of a ΔABC are in arithematic progression, then

1) $c^2=a^2+b^2-ab$ 2) $b^2=a^2+c^2-ac$

3) $c^2=a^2+b^2$ 4) $a^2+b^2+c^2=0$

34. If $\sin^{-1}x=\frac{\pi}{5}$ for some $x\in(-1,1)$, then the value of $\cos^{-1}x$ is

1) $\frac{3\pi}{10}$ 2) $\frac{5\pi}{10}$ 3) $\frac{7\pi}{10}$ 4) $\frac{9\pi}{10}$

35. The equation $\cos x+\sin x=2$ has

1) Only one solution 2) Two solutions
3) No solutions
4) Inginitely many solutions

36. The minimum value of $3\sin\theta+4\cos\theta$ is

1) 5 2) 1 3) 3 4)-5

37. If $\tan\theta=\frac{1}{2}$, $\tan\phi=\frac{1}{3}$ then $\theta+\phi$ is

1) $\frac{\pi}{6}$ 2) π 3) 0 4) $\frac{\pi}{4}$

38. $(z+a)(\bar{z}+a)$, where 'a' is real equivalent to

1) $|z-a|$ 2) z^2+a^2

3) $|z+a|^2$ 4) z^2-a^2

39. If z_1, z_2 are two complex numbers then $|z_1+z_2|$ is

1) $<|z_1|+|z_2|$ 2) $\le|z_1|-|z_2|$

3) $\le|z_1|+|z_2|$ 4) $<|z_1|-|z_2|$

40. If $\sin\theta+\cos\theta=1$ then the value of $\sin 2\theta$ is

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

41. A square root of 3+4i is

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

42. The period of function $f(x)=|\sin x|$ is

1) π 2) 2π 3) 3π 4) 4π

43. If $A+B=45^\circ$ then $(1-\cot A)(1-\cot B)$ is

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

44. The value of $\sin 78^\circ+\cos 132^\circ$ is

1) $\frac{\sqrt{5}+1}{4}$ 2) $\frac{\sqrt{5}+1}{2}$

3) $\frac{\sqrt{5}-1}{2}$ 4) $\frac{\sqrt{5}-1}{4}$

45. If $A+B+C=\pi$, then $\sin2A+\sin2B+\sin2C$

1) 4cosAcosBsinC 2) 4sinAcosBsinC

3) 4cosAcosBcosC 4) 4sinAsinBsinC

46. The principal solution of $\tan x=0$ is

1) $x=n\pi,\ n\in z$ 2) $x=0$

3) $x=(2n+1)\frac{\pi}{2},\ n\in z$

4) $x=n\pi+\alpha,\ n\in z$

47. The value of $\tan^{-1}(2)+\tan^{-1}(3)$ is

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

48. If the sides of a right angle triangle are in A.P then the ratio of its sides is

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

3) 3 : 4 : 5 4) 4 : 5 : 6

49. The value of $r.r_1.r_2.r_3$ is

1) Δ^2 2) Δ^{-2} 3) Δ^{-3} 4) Δ^4

50. $\frac{1}{r_1}+\frac{1}{r_2}+\frac{1}{r_3}=$

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

51. If a = 6, b = 5, c = 9 then angle A is

1) $\cos^{-1}\left(\frac{2}{9}\right)$ 2) $\cos^{-1}\left(\frac{2}{5}\right)$

3) $\cos^{-1}\left(\frac{7}{9}\right)$ 4) $\cos^{-1}\left(\frac{1}{3}\right)$

52. The polar form of complex number 1-i is

1) $\sqrt{2}e^{-i\frac{\pi}{4}}$ 2) $\sqrt{2}e^{i\frac{\pi}{4}}$

3) $\sqrt{2}e^{i\frac{\pi}{2}}$ 4) $\sqrt{2}e^{-i\frac{\pi}{2}}$

53. If 1, ω, ω^2 be the cube roots of unity, then $2^{\omega^3}\cdot 2^{\omega^5}, 2^{\omega}$ is

1) ω 2) ω^2 3) 1 4) 0

54. The value of $\cot\left(\frac{\pi}{20}\right)\cot\left(\frac{3\pi}{20}\right)\cot\left(\frac{5\pi}{20}\right)\cot\left(\frac{7\pi}{20}\right)\left(\frac{9\pi}{20}\right)$

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

55. If $A+B=45^\circ$ then (1+tanA)(1+tanB)=

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

56. $\frac{1+\cos2\theta}{\sin2\theta}=$

1) $\tan2\theta$ 2) $\cot\theta$

3) $\cot^2 2\theta$ 4) $\tan\theta$

57. If $\tan\left(\frac{A}{2}\right)=t$, then sinA+tanA=

1) $\frac{4t}{1-t^4}$ 2) $\frac{2t}{1+t^4}$

3) $\frac{1+t}{1-t}$ 4) $\frac{1-t}{1+t}$

58. The minimum value of $3\sin x+4\cos x+5$ is

1) 5 2) 10 3) -5 4) 0

59. If $\cos x+\cos y=\frac{1}{3}$, $\sin x+\sin y=\frac{1}{4}$, then

$\tan\left(\frac{x+y}{2}\right)=$

1) $\frac{7}{12}$ 2) $\frac{1}{12}$ 3) $\frac{3}{4}$ 4) $\frac{4}{3}$

60. If $3\tan\theta=\cot\theta$, then $\theta=$

1) $n\pi$ 2) $2n\pi+\frac{\pi}{6}$

3) 0 4) $n\pi+\frac{\pi}{6}$ (or) $n\pi-\frac{\pi}{6}$

61. $\sin\left[\sin^{-1}\left(\frac{1}{2}\right)+\cos^{-1}\left(\frac{1}{2}\right)\right]=$

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

62. In ΔABC, if $\frac{a}{\cos A}=\frac{b}{\cos B}=\frac{c}{\cos C}$, then the triangle is

1) Isosceles 2) Equilateral
3) Right angled 4) Right angled Isosceles

63. If sides of a triangle are 13, 14, 15 then the radius of the incircle is

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

64. The modulus of $(7-24i)/(3+4i)$ is

1) 15 2) 20 3) 10 4) 5

65. $\left[\frac{\sqrt{3}}{2}+\frac{i}{2}\right]^6+\left[\frac{\sqrt{3}}{2}-\frac{i}{2}\right]^6=$

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

66. Which of the following statement is TRUE ?

1) The period of sinx is π and period of cosecx is 2π
2) The period of cosx is 2π and period of secx is 2π
3) The period of tanx is 2π and period of cotx is π
4) The period of cosecx is π and period of secx is 3π

67. The range of $3\cos\theta-4\sin\theta$ is

1) [-1, 1] 2) [0,4] 3) [-5,5] 4) [-4,0]

68. If A+B=45°, then (1+tanA)(1+tanB) =

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

69. $\left(\frac{\sin 2A}{1-\cos 2A}\right)\left(\frac{1-\cos 2A}{\cos A}\right)=$

1) $\tan\frac{A}{2}$ 2) $\cos\frac{A}{2}$

3) $\sec\frac{A}{2}$ 4) $\operatorname{cosec}\frac{A}{2}$

70. The value of $\frac{\sin 70^\circ-\cos 40^\circ}{\cos 50^\circ-\sin 20^\circ}=$

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

71. $4\sin\frac{11\theta}{2}\cos\frac{11\theta}{2}\cos 5\theta$ expressed as sum or difference is

1) $\sin 15\theta-\sin 6\theta$ 2) $\sin 16\theta+\sin 6\theta$
3) $\sin 11\theta+\sin 8\theta$ 4) $\sin 11\theta+\sin 8\theta$

72. If $2\cos^2\theta+11\sin\theta=7$, the principal value

1) 60° 2) 45° 3) 30° 4) $22\frac{1^\circ}{2}$

73. Which of the following equations is FALSE

1) $\cos^{-1}(-x)=\pi-\cos^{-1}(x)$

2) $\sin^{-1}(-x)=\pi-\sin^{-1}(x)$

3) If $-1\le x\le 1$ then $\cos^{-1}x$

$=\pi-\sin^{-1}x=\frac{\pi}{2}$

4) $\sin^{-1}x\ne\frac{1}{\sin x}$

74. In any triangle ABC, $\sum(b+c)\cos A=$

1) a + b + c 2) 2(a + b + c)
3) 3(a + b + c) 4) 0

75. With the usual notation, in a ΔABC

$s\left(\frac{r_1-r}{a}+\frac{r_2-r}{b}+\frac{r_3-r}{c}\right)=$

1) $2(r_1+r_2+r_3)$ 2) $3(r_1+r_2+r_3)$

3) $r_1+r_2+r_3$ 4) 0

76. The modulus amplitude form of $-\sqrt{3}+i$ is

1) $2\text{cis}\frac{5\pi}{6}$ 2) $2\text{cis}\frac{3\pi}{6}$

3) $2\text{cis}\frac{\pi}{8}$ 4) $2\text{cis}\frac{\pi}{6}$

77. If $A+B+C=90°$, then $\tan A\tan B+\tan B\tan C+\tan C\tan A$ is

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

78. If $x+\frac{1}{x}=2\cos\theta$ then $x^2+\frac{1}{x^2}=$

1) $4\cos^2\theta$ 2) $4\cos 2\theta$

3) $2\cos^2\theta$ 4) $2\cos 2\theta$

79. If $A+B+C=180°$, then $\sin 2A+\sin 2B+\sin 2C$ is equl to

1) $\sin 2A\sin 2B\sin 2C$ 2) $\sin A\sin B\sin C$

3) $4\sin 2A\sin 2B\sin 2C$ 4) $4\sin A\sin B\sin C$

80. If $\tan^{-1}x+\tan^{-1}y+\tan^{-1}z=\pi$, then $x+y+z$ is equal to

1) 0 2) 1 3) xyz 4) x-y-z

81. The general solution of $\tan^2\theta=3$ is

1) $n\pi$ 2) $n\pi\pm\frac{\pi}{3}$ 3) $\frac{n\pi}{3}$ 4) π

82. In any triangle ABC, if R is a circum radius, then the value $\frac{\sin A}{a}+\frac{\sin B}{b}+\frac{\sin C}{c}=$

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

83. If a, b, c are the sides of a triangle, then the angle a can be obtained by $\cos A=$

1) $\frac{a^2+b^2+c^2}{2bc}$ 2) $\frac{a^2-b^2+c^2}{2bc}$

3) $\frac{a^2+b^2-c^2}{2bc}$ 4) $\frac{-a^2+b^2+c^2}{2bc}$

84. $(\cos hx+\sin hx)^n=$

1) $\cos n\,hx+\sin n\,hx$ 2) $\cos^n hx+\sin^n hx$

3) $\cos h^n x+\sin h^n x$ 4) $\cos h\,nx+\sin h\,nx$

85. If $(\cos\theta+i\sin\theta)^n=$

1) $\cos^n\theta+i\sin^n\theta$ 2) $\cos\theta^n+i\sin\theta^n$

3) $\cos\theta+i\sin\theta$ 4) $\cos n\theta+i\sin n\theta$

86. If $z=\cos\theta+i\sin\theta$ then $z^3+\frac{1}{z^3}$ is equalto

1) $\cos^3\theta$ 2) $\cos 3\theta$

3) $2\cos^3\theta$ 4) $2\cos 3\theta$

88. $\cos^{-1}\left(\cos\frac{5\pi}{4}\right)=$

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

89. If $\cos\theta=\frac{1}{2}\left(a+\frac{1}{a}\right)$, then $\cos 3\theta=$

$k\left(a^3+\frac{1}{a^3}\right)$ where k is equal to

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

90. $\tan 20°+\tan 40°+\tan 60°+....+\tan 180°=$

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

91. If $\sin\theta+\sin 3\theta+\sin 5\theta=0$, $0\le\theta\le\frac{\pi}{2}$, then $\theta=$

1) $0,\frac{\pi}{3}$ 2) $0,\frac{\pi}{2}$ 3) $1,\frac{\pi}{2}$ 4) $2,\frac{\pi}{3}$

92. If $u=\log\left(\tan\left(\frac{\pi}{4}+\frac{\theta}{2}\right)\right)$ then $\cosh u=$

1) $\sin\theta$ 2) $\cos\theta$ 3) $\sec\theta$ 4) $\text{cosec}\,\theta$

93. In ΔABC, if $a\cos A+b\cos B+c\cos C=\frac{2\Delta}{k}$, then $k=$

1) r 2) R 3) s 4) R^2

94. $\frac{3\cos\theta+\cos 3\theta}{3\sin\theta-\sin 3\theta}=$

1) $\cot^2\theta$ 2) $\cot^4\theta$ 3) $\cot^3\theta$ 4) $2\cot\theta$

95. If in ΔABC, if $b\cos A=a\cos B$ then the triangle is

1) Right angled 2) Isosceles

3) Equilateral 4) Scalene

96. If in ΔABC, $\tan\frac{A}{2}=\frac{5}{6}$ and $\tan\frac{C}{2}=\frac{2}{5}$, then a,b,c are in such that

1) $b^2=ac$ 2) $2b=a+c$
3) $2ac=b(a+c)$ 4) $a+b=c$

97. Imaginary part of $\frac{4+3i}{(2+3i)(4-3i)}=$

1) $\frac{86}{325}$ 2) $-\frac{86}{325}$ 3) $\frac{27}{325}$ 4) $\frac{29}{325}$

98. The values of $i^2+i^4+i^6+\ldots+(2n+1)$ terms =
1) 1 2) -1 3) 0 4) i

99. If $x=\cos\theta+i\sin\theta$ then the value of $x^6+\frac{1}{x^6}$ is

1) 0 2) $2i\sin 6\theta$
3) $2\cos 6\theta$ 4) $2(\cos 6\theta+\sin 6\theta)$

2019 - AP ECET

100. If $\tan^2\theta+\sec\theta=5$ then the value of $\cos\theta$ is

1) $-\frac{1}{3}$ or $\frac{1}{2}$ 2) $-\frac{11}{12}$ or $\frac{1}{2}$
3) $\frac{13}{12}$ or $-\frac{1}{3}$ 4) $\frac{5}{4}$ or $\frac{1}{2}$

101. The value of $16\sin^3\theta+8\cos^3\theta$ is
1) 3 2) 1 3) -1 4) 0

102. If $\sin\alpha=\frac{15}{17}$, $\cos\beta=\frac{12}{13}$ then the value of $\sin(\alpha+\beta)$ is

1) $\frac{110}{105}$ 2) $-\frac{121}{152}$ 3) $\frac{220}{221}$ 4) $\frac{5}{4}$

103. The value of $\cos 20^\circ\cos 40^\circ\cos 60^\circ\cos 80^\circ$ is

1) $\frac{11}{12}$ 2) $\frac{1}{16}$ 3) $\frac{13}{12}$ 4) $\frac{5}{4}$

104. The value of $\frac{\cos 17^\circ+\sin 17^\circ}{\cos 17^\circ-\sin 17^\circ}$ is

1) $\cos 20^\circ$ 2) $\tan 65^\circ$
3) $\tan 60^\circ$ 4) $\tan 62^\circ$

105. The value of $\sin\frac{\pi}{5}\sin\frac{2\pi}{5}\sin\frac{3\pi}{5}\sin\frac{4\pi}{5}=$

1) $\frac{4}{15}$ 2) $\frac{5}{16}$ 3) $-\frac{5}{16}$ 4) $\frac{7}{15}$

106. If $\tan^{-1}x+\tan^{-1}y+\tan^{-1}z=\frac{\pi}{2}$ then the value of $xy+yz+zx$ is

1) -1 2) 3 3) 5 4) 1

107. The general solution of $4\cos^2 x-3=0$ is

1) $2n\pi\pm\frac{\pi}{6}$ 2) $2n\pi\pm\frac{7\pi}{6}$
3) $3n\pi\pm\frac{5\pi}{6}$ 4) $2n\pi\pm\frac{11\pi}{6}$

108. The modulus of a complex number $\sqrt{3}+i$ is

1) 2) 3 3) 2 4) 5

109. The value of $(a-b)^2\cos^2\left(\frac{c}{2}\right)+(a+b)^2\sin^2\left(\frac{c}{2}\right)$ is

1) c^3 2) c 3) c^5 4) c^2

110. If $x+\frac{1}{x}=2\cos\theta$ then the value of $x^n+\frac{1}{x^n}$ is

1) $2\cos n\theta$ 2) $-2\cos n\theta$
3) $3\cos\theta$ 4) $2\sin n\theta$

111. The value of $2\tan^{-1}\left(\frac{1}{3}\right)+\tan^{-1}\left(\frac{1}{7}\right)$ is

1) $\frac{\pi}{4}$ 2) $-\frac{\pi}{4}$ 3) $\frac{\pi}{6}$ 4) $\frac{\pi}{3}$

2019 - TS ECET

112. $\cos\frac{2\pi}{7}+\cos\frac{4\pi}{7}+\cos\frac{6\pi}{7}=$ _____

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

113. If the angles A, B and C of a triangle are in an arithmetic progression and if a, b and c denote

the lengths of the sides opposite to A, B and C respectively, then the value of the expression $\frac{a}{c}\sin 2C+\frac{c}{a}\sin 2A$ is ___

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

114. If $\sin x+\sin y=\frac{1}{4}$ and $\cos x+\cos y=\frac{1}{3}$, then $\cot(x+y)=$ _____

1) $\frac{7}{24}$ 2) $\frac{24}{7}$ 3) $\frac{3}{4}$ 4) 1

115. If $\sin(x^\circ+28^\circ)=\cos(3x^\circ-78^\circ)$ and $0^\circ<x^\circ<90^\circ$, then which of the following is the value of x°?

1) 50° 2) 30° 3) 16° 4) 8°

116. If $x=\tan\left(\text{cosec}^{-1}\frac{65}{63}\right)$ and $y=\sec^2\left(\cot^{-1}\frac{1}{2}\right)+\text{cosec}^2\left(\tan^{-1}\frac{1}{3}\right)$, then $(x,y)=$ _____

1) $\left(\frac{63}{16},15\right)$ 2) $\left(\frac{16}{63},15\right)$

3) $\left(\frac{63}{16},5\right)$ 4) $\left(\frac{16}{63},5\right)$

117. The equation $\tan^{-1}\left(\frac{x+1}{x-1}\right)+\tan^{-1}\left(\frac{x-1}{x}\right)=\tan^{-1}(-7)$ has _____

1) unique solution $x=2$
2) two solutions $x=1,2$
3) no solution
4) infinite number of solutions

118. In a triangle ABC, let a, b and c denote the lengths of the sides opposite to A, B and C respectively. If $\frac{1}{a+c}+\frac{1}{b+c}=\frac{3}{a+b+c}$, then the angle C is ___

1) 30° 2) 90° 3) 60° 4) 45°

119. If $\sin h\,x=3$ then $x=$ _____

1) $\log\left(3+\sqrt{10}\right)$ 2) $\log\left(3-\sqrt{10}\right)$

3) $\log\left(6+\sqrt{10}\right)$ 4) 1

120. Which of the followingis NOT true for the complex numbers z_1 and z_2?

1) $\frac{z_1}{z_2}=\frac{z_1\bar{z}_2}{|z_2|^2}$

2) $|z_1+z_2|\le|z_1|+|z_2|$

3) $|z_1+z_2|\le|z_1|-|z_2|$

4) $|z_1+z_2|^2+|z_1-z_2|^2=2|z_1|^2+2|z_2|^2$

121. If a complex number $z=\frac{\sqrt{3}}{2}+i\frac{1}{2}$, then z^4 is _____.

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

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

2020 - AP ECET

122. If $\sin 780^\circ\sin 480^\circ-\cos 120^\circ\sin 330^\circ=k$ then k is

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

123. If A, B, C, D are the angles of cyclic quadrilateral taken in order, then $\cos A+\cos B+\cos C+\cos D=$

1) 0 2) 2 3) –1 4) –2

124. If $\tan\theta=\frac{4}{3}$ then $\sqrt{\frac{1-\sin\theta}{1+\sin\theta}}=$

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

125. The period of the function $f(x)=|\sin x|$ is

1) 2π 2) π 3) 3π 4) 4π

126. The value of

$\tan 1^\circ \tan 2^\circ \tan 3^\circ \ldots\ldots\ldots\ldots \tan 89^\circ$ is

1) 1 2) 0 3) -1 4) ∞

127. If $f(x) = \cos^2 x + \sec^2 x$ then its value always is

1) $f(x) < 1$ 2) $f(x) = 1$

3) $2 > f(x) < 1$ 4) $f(x) \geq 2$

128. If n is odd, then

$$\left(\frac{\cos x + \cos y}{\sin x - \sin y}\right)^n + \left(\frac{\sin x + \sin y}{\cos x - \cos y}\right)^n =$$

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

129. The value of $\tan^{-1}(2) + \tan^{-1}(3)$ is

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

130. The trigonometric equation $\sin^{-1} x = 2\sin^{-1} a$, has a solution for

1) $|a| < \frac{1}{2}$ 2) $|a| \geq \frac{1}{\sqrt{2}}$

3) $\frac{1}{2} < |a| < \frac{1}{\sqrt{2}}$ 4) $|a| \leq \frac{1}{\sqrt{2}}$

131. The solution set of the system of equations $x + y = \frac{2\pi}{3}$ and $\cos x + \cos y = \frac{3}{2}$ is

1) ϕ

2) $\left\{n\pi + \frac{2\pi}{3}, n = 1, 2, 3, \ldots\ldots\right\}$

3) $\left\{n\pi - \frac{2\pi}{3}, n = 1, 2, 3, \ldots\ldots\right\}$

4) 0

132. If $z = \frac{7-i}{3-4i}$ then z^{14} is

1) 2^7 2) $2^7 i$ 3) $-2^7 i$ 4) -2^7

133. $i^2 + i^4 + i^6 + \ldots.(2n+1)$ terms is

1) 0 2) -1 3) $-i$ 4) i

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134. $\sin^2 10^\circ + \sin^2 20^\circ + \sin^2 30^\circ + \ldots\ldots$
$+ \sin^2 80^\circ + \sin^2 90^\circ =$

1) 0 2) 2 3) 4 4) 5

135. Assertion (A): $\tan 6^\circ \tan 42^\circ \tan 66^\circ \tan 78^\circ = 1$

Reasoning (R): If 3A is not an odd multiple of $\frac{\pi}{2}$ then $\tan A \cdot \tan(60^\circ + A) \tan(60^\circ - A) = \tan 3A$

1) A is true, R is true and Ri correct explanation of A
2) A is true, R is true and R is not correct explanation of A
3) A is true, R is false
4) A is false, R is true

136. If θ_1, θ_2 are solutions of the equation $\cos 2\theta + 2\sin 2\theta = 3$, $\tan\theta_1 \neq \tan\theta_2$, then $\cot\theta_1 \cdot \cot\theta_2 =$

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

137. If $\tan^{-1}\left(\frac{1-x}{1+x}\right) = \frac{1}{2}\tan^1 x$, then the value of x is

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

138. If $\sinh^3 x - \cosh^3 x = \frac{Ke^x - e^{Kx}}{1-K}$, then $K =$

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

139. If in a ΔABC, with usual notation $(a-b)(S-c) = (b-c)(S-a)$, then

1) r_1, r_2, r_3 are in GP 2) a, b, c are in AP

3) r_1, r_2, r_3 are in AP 4) a, b, c are in GP

140. Consider a triangle ABC and its incircle. Let $2S$ be the perimeter of the triangle. Let D, E, F be the points of contact of the incircle with the triangle. Suppose D, E, F lie on AB, BC and CA respectively, then AD+BE+CF=

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

141. If $\sin\alpha+\sin\beta+\sin\gamma=3$, then the value of $\tan\frac{\alpha}{2}+\tan\frac{\beta}{2}+\tan\frac{\gamma}{2}$ is

1) $\frac{3}{2}$ 2) 2 3) $\frac{5}{2}$ 4) 3

142. $cis\frac{\pi}{5}cis\frac{\pi}{10}cis\frac{3\pi}{10}cis\frac{4\pi}{10}=$

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

143. The complex number $\frac{2-i}{(1-2i)^2}$ lies in the

1) first quadrant 2) second quadrant
3) third quadrant 4) fourth quadrant

2021 - AP ECET

144. If $\tan\theta=-\frac{4}{3}$ and θ is not in the second quadrant, then, $\cos\theta+\csc\theta=$

1) $-\frac{13}{20}$ 2) $-\frac{1}{5}$ 3) $\frac{27}{20}$ 4) $\frac{7}{5}$

145. The sine function, whose period is $\frac{4}{5}$, is

1) $\sin\frac{5\pi}{4}x$ 2) $\sin\frac{4\pi}{5}x$

3) $\sin\frac{5\pi}{2}x$ 4) $\sin\frac{2\pi}{5}x$

146. If $A+B=\frac{3\pi}{4}$, then $(1-\tan A)(1-\tan B)=$

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

147. If $0<A<\frac{\pi}{4}$ and $\sin A=\frac{3}{5}$, then $\sin 2A+\cos 2A=$

1) $\frac{17}{25}$ 2) $\frac{24}{25}$ 3) $\frac{9}{25}$ 4) $\frac{31}{25}$

148. $\cos 56^\circ+\sin 26^\circ-\sin 86^\circ=$

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

149. The general solution of the trigonometric equation $\sec x=4\cos x$ is $x=$

1) $2n\pi\pm\frac{\pi}{3}$ or $2n\pi\pm\frac{2\pi}{3}$

2) $2n\pi\pm\frac{\pi}{6}$ or $2n\pi\pm\frac{5\pi}{6}$

3) $2n\pi\pm\frac{\pi}{4}$ or $2n\pi\pm\frac{3\pi}{4}$

4) $n\pi+(-1)^n\frac{\pi}{3}$ or $n\pi+(-1)^n\frac{2\pi}{3}$

150. The general solution of the trigonmetric equation $\cos 4\theta=\cos 3\theta$ is $\theta=$

1) $n\pi+\frac{\pi}{6}$ 2) $2n\pi+\frac{\pi}{3}$

3) $\frac{2n\pi}{7}$ or $2n\pi$ 4) $\frac{n\pi}{7}$ or $n\pi$

151. $\cos\left[\frac{\pi}{2}+\cos^{-1}\left(\frac{3}{5}\right)\right]=$

1) $\frac{4}{5}$ 2) $\frac{3}{5}$ 3) $-\frac{4}{5}$ 4) $-\frac{3}{5}$

152. $\cot\left[\tan^{-1}\left(\frac{1}{6}\right)+\tan^{-1}\left(\frac{5}{7}\right)\right]=$

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

153. In a triangle ABC, if $b=3$, $c=4$ and $A=\frac{7}{8}$, then, $a=$

1) 5 2) 2 3) 6 4) 8

154. If $i^2=-1$, then $(1-i)^{2020}=$

1) -2^{1010} 2) 2^{1010} 3) 2^{2020} 4) -2^{2020}

155. If $i^2=-1$, then $\left(\sqrt{3}+i\right)^4+\left(\sqrt{3}-i\right)^4=$

1) 32 2) -32 3) 16 4) -16

2021 - TS ECET

156. If $\tan\theta=\frac{p}{q}$ then $\frac{p\sin\theta-q\cos\theta}{p\sin\theta+q\cos\theta}=$

1) $\frac{p-q}{p+q}$ 2) $\frac{p^2-q}{p+q^2}$

3) $\frac{p^2-q^2}{p^2+q^2}$ 4) $\frac{2p}{p+q}$

157. If the area of a triangle is 75 sq.cm and two of its sides are 20 cm and 15 cm then the included angle between the sides is

1) 60° or 120° 2) 30° or 150°

3) 45° or 135° 4) 90° or 135°

158. If $\cosh 2x = 99$, then $\coth x =$

1) $\frac{5}{7\sqrt{2}}$ 2) $\frac{10}{7\sqrt{2}}$ 3) $\frac{10}{2\sqrt{7}}$ 4) $\frac{5}{2\sqrt{7}}$

159. A complex number 'z' having least modulus value and satisfying $|z-2+2i|=1$ is

1) $\left(2-\frac{1}{\sqrt{2}}\right)(1+i)$ 2) $\left(2+\frac{1}{\sqrt{2}}\right)(1+i)$

3) $\left(2-\frac{1}{\sqrt{2}}\right)(1-i)$ 4) $\left(2+\frac{1}{\sqrt{2}}\right)(1-i)$

160. If $\frac{(1+i)x-2i}{3+i}+\frac{(2-3i)y+i}{3-i}=1$, then $x+y=$

1) $\frac{75}{67}$ 2) $\frac{18}{37}$ 3) $\frac{57}{35}$ 4) $\frac{66}{23}$

161. $\left(\frac{\sqrt{3}+i}{2}\right)^6+\left(\frac{\sqrt{3}-i}{2}\right)^6=$

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

2022 - AP ECET

162. Given that $A=\sin^2\theta+\cos^4\theta$, then for all real values of θ

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

3) $\frac{13}{16}\le A\le 1$ 4) $\frac{3}{4}\le A\le\frac{13}{16}$

163. If $\tan\theta=-\frac{4}{3}$, then $\sin\theta=$

1) $-\frac{4}{5}$ but not $\frac{4}{5}$ 2) $-\frac{4}{5}$ or $\frac{4}{5}$

3) $\frac{4}{5}$ but not $-\frac{4}{5}$ 4) $-\frac{3}{5}$ but not $\frac{3}{5}$

164. The general solution of $\sin x-3\sin 2x+\sin 3x=\cos x-3\cos 2x+\cos 3x$

1) $n\pi+\frac{\pi}{8}$ 2) $\frac{n\pi}{2}+\frac{\pi}{8}$

3) $(-1)^n\frac{n\pi}{2}+\frac{\pi}{8}$ 4) $2n\pi+\cos^{-1}\frac{3}{2}$

165. If x, y, z are in AP and $\tan^{-1}x$, $\tan^{-1}y$ and $\tan^{-1}z$ are also in AP then

1) $x=y=z$ 2) $2x=3y=6z$

3) $6x=3y=2z$ 4) $6x=4y=3z$

166. If $\tan^{-1}2x+\tan^{-1}3x=\frac{\pi}{4}$ then $x=$

1) $\frac{1}{6}$ 2) $\frac{1}{3}$ 3) $\frac{1}{2}$ 4) $\frac{3}{2}$

167. The sides of a triangle are in the ratio $1:\sqrt{3}:2$ then the angles of the triagnle are in the ratio

1) 1 : 3: 5 2) 2 : 3 : 2

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

168. Let $\cos(\alpha+\beta)=\frac{4}{5}$ and $\sin(\alpha-\beta)=\frac{5}{13}$ where $0<\alpha,\beta\le\frac{\pi}{4}$ then $\tan 2\alpha=$

1) $\frac{19}{12}$ 2) $\frac{20}{7}$ 3) $\frac{25}{16}$ 4) $\frac{56}{33}$

169. If $1+\sin x+\sin^2 x+\sin^3 x+....\infty=4+2\sqrt{3}$, $0<x<\pi$, then $x=$

1) $\frac{\pi}{6}$ 2) $\frac{\pi}{4}$ 3) $\frac{2\pi}{3}$ 4) $\frac{3\pi}{4}$

170. The angles of a triangle are in the ratio 3:5:10 then the ratio of the smallest side to the greatest side is

1) 1 : sin 10° 2) 1 : 2sin 10°

3) $1:\cos 10^\circ$ 4) $1:2\cos 10^\circ$

171. If $\sin^{-1}x+\sin^{-1}y=\frac{2\pi}{3}$ then $\cos^{-1}x+\cos^{-1}y=$

1) $\frac{2\pi}{3}$ 2) $\frac{\pi}{3}$ 3) $\frac{\pi}{6}$ 4) π

172. The conjugate of a complex number is $\frac{1}{i-1}$, then that complex number is

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

173. The value of $\frac{\left(\sin\frac{\pi}{8}+i\cos\frac{\pi}{8}\right)^8}{\left(\sin\frac{\pi}{8}-i\cos\frac{\pi}{8}\right)^8}=$

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

174. The period of $4\sin\left(\frac{x}{2}\right)+5\cos\left(\frac{x}{2}\right)$

1) π 2) 2π 3) 3π 4) 4π

175. If $\sin x=\frac{p-q}{p+q}$ then $\tan\left(\frac{\pi}{4}-\frac{x}{2}\right)=$

1) $\sqrt{\frac{p}{q}}$ 2) $\sqrt{pq}$ 3) $\sqrt{\frac{q}{p}}$ 4) 1

176. The numerical value of $\tan\left[2\tan^{-1}\left(\frac{1}{5}\right)-\frac{\pi}{4}\right]$ is

1) $\frac{7}{17}$ 2) $\frac{-7}{17}$ 3) $\frac{17}{7}$ 4) $\frac{-17}{7}$

177. If $\tan x+\cot x=\frac{4}{\sqrt{3}}$ then $x=$

1) $n\pi+\frac{\pi}{6}$, $n\pi\pm\frac{\pi}{3}$ $n\in Z$

2) $2n\pi\pm\frac{\pi}{6}$, $2n\pi\pm\frac{\pi}{3}$ $n\in Z$

3) $n\pi+\frac{\pi}{6}$, $n\pi-\frac{\pi}{3}$ $n\in Z$

4) $n\pi+\frac{\pi}{4}$ $n\in Z$

178. If in a ΔABC, if $\frac{\sin B}{\sin C}=2\cos A$ then the triangle is

1) Equilateral triangle 2) Right angled triangle
3) Isosceles triangle 4) Scalene triangle

179. If z is a complex number such that $|z|=4$ and $\arg(z)=\frac{5\pi}{6}$ then $z=$

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

PREVIOUS ECET BITS KEY

01) 4	02) 2	03)1	04) 2	05) 4
06) 3	07) 4	08) 1	09) 4	10) 1
11) 3	12) 2	13) 1	14) 2	15) 2
16) 2	17) 1	18) 3	19) 2	20) 3
21) 1	22) 1	23) 1	24) 4	25) 3
26) 1	27) 1	28) 3	29) 3	30) 3
31) 3	32) 2	33) 2	34) 1	35) 3
36) 4	37) 4	38) 3	39) 3	40) 3
41) 2	42) 1	43) 3	44) 4	45) 4
46) 1	47) 4	48) 3	49) 1	50) 1
51) 3	52) 1	53) 3	54) 3	55) 4
56) 2	57) 1	58) 4	59) 3	60) 2
61) 1	62) 2	63) 3	64) 2	65) 1
66) 2	67) 3	68) 4	69) 1	70) 3
71) 2	72) 3	73) 2	74) 1	75) 3
76) 1	77) 2	78) 4	79) 4	80) 3
81) 2	82) 4	83) 4	84) 4	85) 4
86) 4	87) 2	88) 2	89) 1	90) 1
91) 1	92) 3	93) 2	94) 3	95) 3
96) 2	97) 3	98) 2	99) 3	100) 1
101)	102) 3	103) 2	104) 4	105) 2
106) 1	107) 1	108) 3	109) 4	110) 1
111) 1	112) 3	113) 1	114) 1	115) 4
116) 1	117) 1	118) 3	119) 1	120) 3
121) 2	122) 3	123) 1	124) 1	125) 2
126) 1	127) 4	128) 3	129) 4	130) 4
131) 1	132) 3	133) 2	134) 4	135) 1
136) 4	137) 2	138) 2	139) 3	140) 3
141) 4	142) 1	143) 2	144) 1	145) 3

146) 3	147) 4	148) 2	149) 1	150) 3
151) 3	152) 3	153) 2	154) 1	155) 4
156) 3	157) 2	158) 2	159) 3	160) 4
161) 1	162) 2	163) 2	164) 2	165) 1
166) 1	167) 4	168) 4	169) 3	170) 4
171) 2	172) 1	173) 3	174) 4	175) 1
176) 2	177) 1	178) 3	179) 2	

4. CO-ORDINATE GEOMETRY

2007

01. The focus of the parabola $x^2 = 4ay$ is :

1) $(0,a)$ 2) $(a,0)$ 3) $(0,-a)$ 4) $(0,2a)$

02. The parametric equation of the parabola is :

1) $x = at, y = at^2$ 2) $x = at^2, y = 2at$

3) $x = at^3, y = 2at^2$ 4) $x = at^3, y = 3at$

03. Any tangent to $y^2 = 4ax$ is :

1) $y = mx + c$ 2) $y = ax + mx$

3) $y = a + mx$ 4) $y = mx + a/m$

04. The equation $x^2/a^2 + y^2/b^2 = 1$ is called as :

1) parabola 2) circle

3) ellipse 4) square

05. The eccentricity of the equation $x^2/a^2 + y^2/b^2 = 1$ is

1) $b^2 = a^2(1-e^2)$ 2) $e^2 = a^2 + b^2$

3) $a^2 = 1 - e^2$ 4) $b^2 = a^2$

06. The eccentricity of the Hyperbola $y^2/9 - x^2/16 = 1$ is :

1) 3/5 2) 1/2 3) 5/3 4) -3/5

07. The co-ordinates of the foci of hyperbola is $x^2/a^2 - y^2/b^2 = 1$

1) $(ae,0)$ and $(-ae,0)$

2) $(be,0)$ and $(-be,0)$

3) $(e,0)$ and $(-ae,0)$

4) (a,b) and $(-a,-b)$

2008

08. The equation of the circle with radius 3 and centre $(3,-2)$ is

1) $x^2 + y^2 - 6x + 4y + 4 = 0$

2) $x^2 + y^2 + 6x + 4y + 5 = 0$

3) $x^2 + y^2 + 6x - 4y - 4 = 0$

4) $x^2 + y^2 + 6x + 4y + 10 = 0$

09. The equation of the circle having $(3,4)$ and $(-7,2)$ as extremities of diameter is

1) $x^2 + y^2 + 4x - 6y - 13 = 0$

2) $x^2 + y^2 - 4x + 6y + 13 = 0$

3) $x^2 + y^2 + 4x + 6y + 13 = 0$

4) $x^2 + y^2 + 4x + 6y - 13 = 0$

10. The vertex of the parabola $x^2 + 4x + 4y + 8 = 0$ is at

1) $(2,1)$ 2) $(1,2)$

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

11. The length of latus rectum of ellipse $\frac{x^2}{25} + \frac{y^2}{9} = 1$ is

1) $\frac{25}{3}$ 2) $-\frac{50}{3}$ 3) 185 4) $\frac{50}{3}$

12. The equation of the hyperbola with centre (0,0) with distance between foci 18 and distance between directrices 8 is

1) $\frac{x^2}{36} - \frac{y^2}{45} = 1$ 2) $\frac{x^2}{45} - \frac{y^2}{36} = 1$

3) $\frac{x^2}{9} - \frac{y^2}{16} = 1$ 4) $\frac{x^2}{25} - \frac{y^2}{16} = 1$

2009

13. Find the equation which passes through $(-7,1)$ and has centre $(-4,3)$

1) $x^2 + y^2 + 8x + 6y + 25 = 0$

2) $x^2 + y^2 + 8x + 6y = 0$

3) $x^2+y^2-8x+6y-5=0$

4) $x^2+y^2-8x-6y=0$

14. The equation of the circle passing through the point $(1,-2)$ and concentric with $x^2+y^2+8x+12y+15=0$ is

1) $x^2+y^2-8x-12y-15=0$

2) $x^2+y^2-8x+12y-15=0$

3) $x^2+y^2+8x+12y+11=0$

4) $x^2+y^2-8x-8y-11=0$

15. The focus of the parabola $(y-1)^2=8(x-3)$ is

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

16. Obtain the equation of the ellipse with centre $(-2,4)$, major axis 12 and minor axis 8

1) $\frac{(x+2)^2}{36}+\frac{(y-4)^2}{16}=1$

2) $\frac{(x-2)^2}{16}+\frac{(y+4)^2}{36}=1$

3) $\frac{(x-2)^2}{36}+\frac{(y-4)^2}{16}=1$

4) $\frac{(x-2)^2}{16}+\frac{(y-4)^2}{36}=1$

17. The eccentricity and latus rectum of the hyperbola $\frac{(x-1)^2}{16}-\frac{(y-2)^2}{9}=1$ is

1) $\left(\frac{5}{4},\frac{9}{2}\right)$ 2) $\left(-\frac{5}{4},-\frac{9}{2}\right)$

3) $\left(-\frac{5}{4},2\right)$ 4) $\left(2,\frac{9}{2}\right)$

2010

18. The equation of the circle passing through $(0,0),(0,a),(a,0)$ is

1) $x^2+y^2+ax+ay=0$

2) $x^2+y^2-ax-ay=0$

3) $x^2+y^2+2ax+2ay=0$

4) $x^2+y^2-2ax-2ay=0$

19. The equation of the tangent at $(1,1)$ to the circle $2x^2+2y^2-2x-5y+3=0$ is

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

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

20. The vertex of the parabola $x^2+8x+12y+4=0$ is

1) $(-4,1)$ 2) $(4,-1)$

3) $(-4,-1)$ 4) $(4,1)$

21. The axis of the parabola $x^2-3y-6x+6=0$ is

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

3) $x=3$ 4) $y=1$

22. The product of the perpendicular from the foci on any tangents to the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ is

1) a^2 2) a^2-b^2

3) b^2 4) $\sqrt{a^2+b^2}$

2011

23. The equation of the circle passing through the origin $x^2+y^2-6x-2y=0$. The equation of one of its diameters is

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

3) $x=y$ 4) $3x+y=0$

24. If $(x,3)$ and $(3,5)$ are the extremities of a circle with center at $(2,y)$, then the value of x and y is

1) $x=1, y=4$ 2) $x=4, y=1$

3) $x=8, y=2$ 4) $x=0, y=5$

25. The focus of the parabola $y^2-x-2y+2=0$ is

1) $\left(\frac{1}{4},0\right)$ 2) $(1,2)$

3) $\left(\frac{3}{4},1\right)$ 4) $\left(\frac{5}{4},1\right)$

26. The line $y=mx+1$ is a tangent to the parabola $y^2=4x$ if

1) $m=1$ 2) $m=2$ 3) $m=4$ 4) $m=3$

27. The latus rectum of the ellipse $5x^2+9y^2=45$ is

1) $\frac{5}{3}$ 2) $\frac{10}{3}$ 3) $\frac{2\sqrt{5}}{3}$ 4) $\frac{\sqrt{5}}{3}$

28. The eccentricity of the ellipse $9x^2+5y^2-30y=0$ is

1) 1/3 2) 2/3 3) 3/4 4) 1/9

2012

29. If one end of the diameterof the circle $x^2+y^2-5x-8y+13=0$ is (2,7), then the other end of the diameter is

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

30. The radiusof the circle $\sqrt{1+m^2}\left(x^2+y^2\right)-2cx-2mcy=0$ is

1) $2c$ 2) $4c$ 3) $c/2$ 4) c

31. The equation of the directrix of the parabola $2x^2=-7y$ is

1) $8y+7=0$ 2) $8y-7=0$

3) $7y+8=0$ 4) $8x-7=0$

32. The parametric equations of the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ are

1) $x=a\sec\theta, y=b\tan\theta$

2) $x=b\sin\theta, y=a\cos\theta$

3) $x=a\cos\theta, y=b\sin\theta$

4) $x=a\cos ec\theta, y=b\cot\theta$

33. The condition for a straight line $y=mx+c$ to be a tangent to the hyperbola $\frac{x^2}{a^2}-\frac{y^2}{b^2}=1$ is

1) $c=a/m$ 2) $c^2=a^2m^2-b^2$

3) $c^2=a^2m^2+b^2$ 4) $c^2=a/m$

2013

34. If (3, -1) is the coordinates of one end of the diameter of the circle $x^2+y^2-2x+4y=0$, the coordinates of the other end is

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

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

35. If the radius of the circle $x^2+y^2-8x+10y+k=0$ is 7, then k =

1) 49 2) -1 3) -8 4) 4

36. The length of x-intercept made by the circle $x^2+y^2+4x-7y-12=0$ is

1) 6 units 2) 12 units

3) 4 units 4) 8 units

37. Co-ordinates of the vertex of the parabola $x^2-2ax+2ay=0$ is

1) $(a,a/2)$ 2) $(0,\alpha)$

3) $(a/2,0)$ 4) $(0,-\alpha)$

38. The eccentricity of the ellipse $4x^2+9y^2=36$ is

1) 2 2) 3 3) 3/2 4) $\sqrt{5}/3$

39. The equation of the hyperbola whose focus is (4,0), directrix is the line $4x=9$ and with eccentricity 4/3 is

1) $x^2-7y^2=42$ 2) $7x^2-y^2=63$

3) $x^2+7y^2=42$ 4) $x^2-8y^2=24$

2015

40. If 3x+4y+k=0 touches circle $x^2+y^2=16$, then the value of k

1) ±10 2) ±20 3) ±5 4) ±15

41. The point (-1,0) lies on the circle $x^2+y^2+8y-4x+k=0$ the radius of the circle is

1) 4 2) 5 3) 2 4) 2

42. The equation of the axis of the parabola $x^2-3y=8x+7$ is

1) y + 3 = 0 2) y - 3 = 0

3) x - 4 = 0 4) x + y = 0

43. The eccentricity of the ellipse $3x^2+4y^2+6x-8y=5$ is

1) $\frac{1}{3}$ 2) $\frac{1}{2}$ 3) $\frac{1}{4}$ 4) $\frac{1}{5}$

44. The length of the latus rectum of the hyperbola $16x^2-9y^2-32x+36y=164$ is

1) $\frac{32}{9}$ 2) $\frac{16}{3}$ 3) $\frac{32}{3}$ 4) $\frac{3}{16}$

2016

45. The intercept on x - acis made by the circle $x^2+y^2-6x+13y+5=0$ is

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

46. The equation of the parabola with vertex (-2, 3) and focus (1,3) is

1) $y^2+6y+12x-15=0$

2) $y^2-6y-12x-15=0$

3) $x^2-6y-12x-15=0$

4) $y^2-6y-3x+15=0$

47. The latus rectum of the ellipse $x^2+y^2=3$

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

48. The eccentricity of the hyperbola $4x^2-9y^2=2ax+b^2$ is

1) $\frac{a}{b}$ 2) $\frac{\sqrt{b}}{a}$ 3) $\frac{\sqrt{13}}{3}$ 4) $\frac{13}{\sqrt{3}}$

49. The length of the diameter of the circle $x^2+y^2-6x-8y=0$ is

1) 10 2) 15 3) 5 4) 20

2017

50. If the line $y=2x+c$ is a tangent to $x^2+y^2=5$ then the value of c is _____

1) 2 2) 3 3) 4 4) 5

51. The vertex of the parabola $x^2+8x+12y+4=0$ is

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

52. The number of tangents to the ellipse $\frac{x^2}{4}+\frac{y^2}{2}=1$ through (2,1) is _____

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

53. The length of the latus rectum, of the parabola $x^2-4y^2=4$ is _____

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

54. The length of the diameter of the circle $x^2+y^2-6x-8y=0$ is _____

1) 10 2) 15 3) 5 4) 20

55. If the line $2y=5x+k$ touches the parabola $y^2=6x$ then k = _____

1) $\frac{2}{3}$ 2) $\frac{4}{3}$ 3) $\frac{3}{5}$ 4) $\frac{6}{5}$

56. The slope of the normal to the curve $x=a\sec\theta, y=a\tan\theta$ at $\theta=\frac{\pi}{6}$ is _____

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

57. The rate of change of area of a circle with respect to radius when r =5cm is

1) 2πsq.cm / sec 2) 10πsq.cm / sec

3) 100πsq.cm / sec 4) 20πsq.cm / sec

58. Which of the following function has maxima or minima ?

1) e^x 2) $\log x$

3) x^3+x^2+x+1 4) $\sin x$

59. If the increase in the side of a square is 2% then the approximate percentage increase in the area of the square is _____

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

2018

60. The distance between the parallel striaght lines 3x+4y-3=0 and 6x+8y-1=0 is

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

61. Angle between the lines 3x - 5y - 9 = 0; 4x -y + 7 = 0 is

1) $\theta=30^\circ$ 2) $\theta=45^\circ$ 3) $\theta=60^\circ$ 4) $\theta=15^\circ$

62. Equation of the circle passing through (3, -4) and concentric with $x^2+y^2+4x-2y+1=0$ is

1) $x^2+y^2+4x-2y-15=0$

2) $x^2+y^2+4x-2y-30=0$

3) $x^2+y^2+x-2y-45=0$

4) $x^2+y^2+4x-2y-45=0$

63. The ecentricity of ellipse $9x^2+16y^2=144$ is

1) $\frac{7}{4}$ 2) $\frac{\sqrt{7}}{4}$ 3) $\frac{5}{4}$ 4) $\frac{5}{3}$

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64. The length of the major axis of the ellipse: $4x^2+3y^2=48$ is

1) 10 2) 11 3) 12 4) 13

65. The centre of the ellipse: $9x^2+25y^2-18x+100y-116=0$ is

1) $(2,-1)$ 2) $(-1,-2)$

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

66. The equation of the parabola with vertex $(2,-1)$ and focus $(2,-3)$ is

1) $x^2-4x+8y+12=0$

2) $x^2-4x-8y-12=0$

3) $x^2+4x-8y-12=0$

4) $x^2+5x-8y-11=0$

67. The length of the latus rectum of the hyperbola: $\frac{x^2}{9}-\frac{y^2}{16}=1$ is

1) 9 units 2) 5 units 3) 6 units 4) 13 units

68. If the length of latus rectum is $\frac{9}{2}$ and the distance between its foci is 10 then the equation of hyperbola is

1) $\frac{x^2}{16}+\frac{y^2}{9}=1$ 2) $\frac{x^2}{18}-\frac{y^2}{9}=1$

3) $\frac{x^2}{16}-\frac{y^2}{6}=1$ 4) $\frac{x^2}{16}-\frac{y^2}{9}=1$

69. The equation of the parabola with focus at $(-3,2)$ and vertex $(-2,2)$ is

1) $x^2-4x+8y+12=0$

2) $x^2+5x-8y-11=0$

3) $y^2+4x-4y+12=0$

4) $x^2-4x-8y-12=0$

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70. The equation of the straight line which makes intercepts r and s on the coordinate axes such that $r+s=5$ and $rs=6$ is $ax+by+c=0$ then $a+b+c=$ _____

1) 11 2) 5 3) -7 4) -1

71. If a straight line $ax+by+\sqrt{5}=0$ touches the circle $x^2+y^2=5$, then which of the following is true?

1) $5(a^2+b^2)=1$ 2) $a^2+b^2=\sqrt{5}$

3) $a^2+b^2=1$ 4) $\sqrt{a^2+b^2}=5$

72. If a chord of length 12 cm is at a distance of $4\sqrt{10}$ cm from the centre of the circle, then the radius of the circle is _____

1) 14 cm 2) $\sqrt{304}$ cm

3) 4 cm 4) $\sqrt{124}$ cm

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73. The equation of the polar of $(-2,3)$ with respect to $x^2+y^2-4x-6y+5=0$ is

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

3) $x=0$ 4) $y=0$

74. A parabolic are has a height of 12m and a span of 20m. The height of the arc, 5m away on either side of the centre is

1) 2m 2) 3m 3) 6m 4) 9m

75. The eccentricity of the ellipse whose latus-rectum is one third of its minor axis is

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

76. A conic with eccentricity $\frac{3}{2}$ is

1) parabola 2) ellipse
3) hyperbola 4) circle

77. The focus of the parabola $(y-1)^2 = 8(x-3)$ is

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

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78. The equation of the circle whose ends of a diameter are $(1,2)$ and $(5,2)$ is

1) $x^2+y^2-6x-4y+9=0$
2) $x^2+y^2+6x-4y+9=0$
3) $x^2+y^2-6x-4y+13=0$
4) $x^2+y^2-6x-4y+5=0$

79. The equation of the circle passing through $(0,0)$, $(0,1)$ and $(1,0)$ is

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

80. If the circle $x^2+y^2-4x+2fy+4=0$ touches both coordinate axes, then the set of all possible values of f is

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

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81. If $(1,2)$ and $(2,1)$ are the ends of one of the diameters of a circle, then the equation of the circle is

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

82. The equation of the circle of radius 2 with its centre at $(2,2)$ is

1) $x^2+y^2-4x-4y+4=0$
2) $x^2+y^2+4x+4y+4=0$
3) $x^2+y^2-4x-4y+12=0$
4) $x^2+y^2+4x+4y+12=0$

83. If the centre of the circle $x^2+y^2-6x+ky+9=0$ lies on the lines $2x+y-4=0$, then the radius of that circle is

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

84. Distance from the focus of the parabola $y^2=8x$ to the point $(2,4)$ on it is

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

85. If e is the eccentricity and a is the length of the semi-minor axis of the ellipse $9x^2+4y^2=36$, then $e^2+a^2=$

1) $\frac{41}{9}$ 2) $\frac{23}{9}$ 3) $\frac{17}{3}$ 4) $\frac{11}{3}$

86. One of the foci of the hyperbola $\frac{x^2}{9}-\frac{y^2}{16}=-1$ is

1) $(5,0)$ 2) $(0,5)$ 3) $(4,0)$ 4) $(0,3)$

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87. If the equation of the straight line $x+y+1=0$ is changed into the form $x\cos\alpha+y\sin\alpha=p$, $(p<0)$, then $\alpha=$

1) $\frac{\pi}{4}$ 2) $\frac{3\pi}{4}$ 3) $\frac{5\pi}{4}$ 4) $\frac{7\pi}{4}$

88. GCD of p, q, r is 1. If the line $px+qy+r=0$ is passing through the point $(4,3)$ the sum of the intercepts made by the line on the coordinate axes is 14, then a value of $p+q+r=$

1) -25 2) -23 3) -17 4) 31

89. the distance between the parallel lines $3x-4y+20=0$, $3x-4y+5=0$ is
1) 15 units 2) 20 units
3) 3 units 4) 5 units

90. The distance between the centers of the two circles touching the coordinate axes and the line $3x+4y=12$ in the first quadrant is
1) $5\sqrt{3}$ 2) $2\sqrt{5}$ 3) $3\sqrt{5}$ 4) $5\sqrt{2}$

91. The equation of a tangent to the circle $x^2+y^2-2x+8y-23=0$ having slope 3 is
1) $6x-2y+25=0$ 2) $3x-y+27=0$
3) $3x-y+23=0$ 4) $3x-y+13=0$

92. The interval in which the value of λ lies, if the line $3x-4y=\lambda$ cuts the circle $x^2+y^2-4x-8y=5$ at two points is
1) $(15,35)$ 2) $(35,15)$
3) $(-35,15)$ 4) $(-15,35)$

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93. The lines $2x-3y-5=0$ and $3x-4y=7$ are diameters of a circle of area 49π sq. units, then the equation of the circle is
1) $x^2+y^2+2x-2y-62=0$
2) $x^2+y^2+2x-2y-47=0$
3) $x^2+y^2-2x+2y-47=0$
4) $x^2+y^2-2x+2y-62=0$

94. If the point $(a,-a)$ lies inside the circle $x^2+y^2-4x+2y-8=0$, then 'a' lies in the interval
1) $(-1,4)$ 2) $(-\infty,-1)$
3) $(4,\infty)$ 4) $[-1,4]$

95. The focus of the parabola $y^2-4y-8x+4=0$ is
1) $(1,1)$ 2) $(1,2)$ 3) $(2,1)$ 4) $(2,2)$

96. The equation $\frac{x^2}{10-a}+\frac{y^2}{4-a}=1$ represents an ellipse if
1) $a<4$ 2) $a>4$
3) $4<a<10$ 4) $a>10$

97. The vertices of the hyperbola $9x^2-16y^2-36x+96y-252=0$ are
1) $(6,3)$ and $(-6,3)$
2) $(6,3)$ and $(-2,3)$
3) $(-6,3)$ and $(-6,3)$
4) $\left(0,\pm\frac{2}{3}\right)$

98. The eccentricity of the hyperbola with latus rectum 12 and semi conjugate axis $2\sqrt{3}$ is
1) 2 2) 3 3) $\frac{\sqrt{3}}{2}$ 4) $2\sqrt{3}$

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99. The angle between the lines $kx+y+9=0$ and $y-3x=4$ is 45° then the value of "k" is
1) 2 or $\frac{1}{2}$ 2) 2 or $-\frac{1}{2}$
3) -2 or $\frac{1}{2}$ 4) -2 or $-\frac{1}{2}$

100. If the two lines $2x-3y=5$ and $3x-4y=7$ are two diameters of a circle of radius 7, then the equation of the circle is
1) $x^2+y^2+2x-4y-47=0$
2) $x^2+y^2=49$
3) $x^2+y^2-2x+2y-47=0$
4) $x^2+y^2=17$

101. The parabola $(y+1)^2=a(x-2)$ passes through the point $(-1,2)$. The equation of its directrix is
1) $4x+5=0$ 2) $4x-5=0$

3) $4x+9=0$ 4) $4x-9=0$

102. $P(3,2)$ is a point on the ellipse $\frac{x^2}{18}+\frac{y^2}{8}=1$ whose foci are S and S'. The sum of the distance from S and S' to the point $P(3,2)$ is ____ units

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

103. In a hyperbola the transverse and conjugate axes are in the ratio 3:4. The eccentricity of the hyperbola is

1) $\frac{4}{3}$ 2) $\frac{3}{2}$ 3) $\frac{5}{4}$ 4) $\frac{5}{3}$

PREVIOUS ECET BITS KEY

01) 1	02) 2	03) 4	04) 1	05) 1
06) 3	07) 1	08) 1	09) 1	10) 3
11) 3	12) 1	13) None	14) 3	15) 3
16) 1	17) 2	18) 2	19) 2	20) 1
21) 3	22) 3	23) 1	24) 1	25) 4
26) 1	27) 2	28) 2	29) 1	30) 4
31) 2	32) 2	33)	34) 3	35) 4
36) 1	37) 1	38) 4	39) 1	40) 2
41) 2	42) 3	43) 2	44) 3	45) 1
46) 2	47) 2	48) 3	49) 1	50) 4
51) 1	52) 3	53) 2	54) 1	55) 4
56) 1	57) 2	58) 4	59) 2	60) 1
61) 2	62) 4	63) 2	64)	65) 3
66) 1	67)	68) 4	69) 3	70) 4
71) 3	72) 1	73) 3	74) 4	75) 3
76) 3	77) 3	78) 1	79) 1	80) 3
81) 4	82) 1	83) 2	84) 4	85) 1
86) 2	87) 3	88) 3	89) 3	90) 4
91) 4	92) 3	93) 3	94) 1	95) 4
96) 1	97) 2	98) 1	99) 2	100) 3
101) 2	102) 4	103) 4		