

**AP EAMCET Mathematics Previous Questions with Key – Test 9**

1) A function from  $A = \{x: -1 \leq x \leq 1\}$  to itself which is not a bijection is

- 1)  $f(x) = x|x|$
- 2)  $f(x) = x^3$
- 3)  $f(x) = x^2$
- 4)  $f(x) = \sin\left(\frac{\pi x}{2}\right)$

2) If  $f: \mathbb{R} - \{0\} \rightarrow \mathbb{R}$  is defined by  $f(x) = x + \frac{1}{x}$  and if  $f^k(x) = [f(x)]^k$  for  $k \geq 1$  then  $f^4(x) - f(x^4) - 4f^2(x) =$

- 1)  $x^2 + 3x + 7$
- 2)  $x^2 + 3x - 7$
- 3)  $-x^2 + 3x + 7$
- 4)  $-x^2 - 3x + 7$

3) If  $4^3 + 8^3 + 12^3 + \dots$  up to  $n$  terms  $= kn^2(n+1)^2$  (for all  $n \in \mathbb{N}$ ) then,  $k =$

- 1) 4
- 2) 8
- 3) 16
- 4) 32

4) If  $A = \begin{pmatrix} \cos \theta & \sin \theta \\ -\sin \theta & \cos \theta \end{pmatrix}$  where  $\theta = \frac{2\pi}{19}$  then  $A^{2017} =$

- 1)  $A$
- 2)  $A^3$
- 3)  $A^5$
- 4)  $I$

5) If  $(\alpha, \beta, \gamma)$  is the solution of the system of simultaneous linear equations given by  $3x + 4y - 5z = -6$ ,  $2x + 3y - 4z + 7 = 0$ ,  $4x - 2y + z = 9$  then  $\alpha + 3\beta - 2\gamma =$

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

6) If A and B are two matrices given by  $A = \begin{pmatrix} 1 & 2 & 3 \\ 2 & 3 & 4 \\ 5 & 6 & 8 \end{pmatrix}$  and  $B = \begin{pmatrix} 3 & 2 & 5 \\ 2 & 3 & 8 \\ 7 & 2 & 9 \end{pmatrix}$  then, the value of

$|\text{Adj}(AB)|$  is

1) 24

2)  $24^2$

3)  $24^3$

4) 65

7) If  $\omega$  is a complex cube root of unity, then  $\sum_{k=1}^6 (\omega^k + \frac{1}{\omega^k})^2 =$

1) 6

2) 8

3) 12

4) 24

8) In Argand plane, the quadrant in which  $\frac{1+2i}{1-i}$  lies is

1) First

2) Second

3) Third

4) Fourth

9) If  $z = x + iy$  and if the point P in the Argand plane represents z, then the locus of P satisfying the equation  $|z-3i| + |z+3i| = 10$  is

1) circle with centre (3,-3)

2) Hyperbola with eccentricity  $\frac{5}{3}$

3) Ellipse with eccentricity  $\frac{3}{5}$

4) Ellipse with eccentricity  $\frac{4}{5}$

10) If  $\alpha, \beta$  are the roots of the equation  $x^2 - 2x + 4 = 0$  and for any  $n \in \mathbb{N}$ ,  $\alpha^n + \beta^n = k \cos \frac{n\pi}{3}$  then  $k =$

1)  $2^n$

2)  $2^{n+1}$

3)  $2^n - 1$

4)  $2^n + 1$

11) The number of integral solutions of  $2\left(x^2 + \frac{1}{x^2}\right) - 7\left(x + \frac{1}{x}\right) + 9 = 0$  where  $x \neq 0$

1) 1

2) 2

3) 4

4) 0

12) If  $\left| \frac{x^2 + kx + 1}{x^2 + x + 1} \right| < 3$  for all real  $x$ , then  $k$  is in the interval

1)  $(-\infty, -1)$

2)  $(-1, 6)$

3)  $(-1, 5)$

4)  $(6, \infty)$

13) If  $\alpha, \beta, \gamma$  are the roots of the equation  $x^3 - 6x^2 + 11x + 6 = 0$  then  $\sum \alpha^2\beta + \sum \alpha\beta^2 =$

1) 72

2) 84

3) 90

4) 96

14) If the roots of equation  $x^3 + 3px^2 + 3qx - 8 = 0$  are in a geometric progression then  $\frac{q^3}{p^3} =$

1) 1

2) -2

3) 4

4) -8

15) The number of different signals which can be given from 7 different coloured sheets, taking one or more at a time is

1) 127

2) 5913

3) 13699

4) 1700

16) If the number of subsets with 8 elements from the set  $A = \{ a_1, a_2, a_3, \dots, a_n \}$ ,  $n \geq 8$  is five times the number of such subsets containing  $a_4$ , then  $n =$

1) 35

2) 40

3) 45

4) 0

17)  ${}^{29}C_5 \sum_{r=0}^4 {}^{(33-r)}C_4 =$

1)  ${}^{32}C_4$

2)  ${}^{34}C_5$

3)  ${}^{34}C_4$

4)  ${}^{34}C_5$

18) The coefficient of  $x^2$  in the expansion of  $(1+x)^2(8-x)^{-1/3}$  is

1)  $\frac{2167}{4032}$

2)  $\frac{2265}{4132}$

3)  $\frac{313}{576}$

4)  $\frac{3691}{6792}$

19) The sum of the rational terms in the expansion of  $(\sqrt{2} + \sqrt[5]{3})^{10}$

1) 41

2) 42

3) 32

4) 39

20) If  $\frac{x^3 + x^2 + 1}{(x^2 + 2)(x^2 + 3)} = \frac{Ax + B}{x^2 + 2} + \frac{Cx + D}{x^2 + 3}$ ,

then  $A+B+C+D =$

1) 1

2) 4

3) 3

4) 2

21)  $\cos^4 \frac{\pi}{12} + \cos^4 \frac{5\pi}{12} + \cos^4 \frac{7\pi}{12} + \cos^4 \frac{11\pi}{12} =$

1) 2

2) 1

3)  $\frac{7}{4}$

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

22) If  $\frac{\tan(\alpha + \beta - \gamma)}{\tan(\alpha - \beta + \gamma)} = \frac{\tan \gamma}{\tan \beta}$  and  $\beta \neq \gamma$ , then the value of  $\sin 2\alpha + \sin 2\beta + \sin 2\gamma$  is

1) 0

2) 1

3) 2

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

23)  $1 + \cos^2 \theta = 3 \sin \theta \cos \theta \Rightarrow \theta =$

1)  $n\pi + \frac{\pi}{4}, n\pi - \tan^{-1}\left(\frac{1}{2}\right); n \in \mathbb{Z}$

2)  $n\pi - \frac{\pi}{4}, n\pi + \tan^{-1}2; n \in \mathbb{Z}$

3)  $n\pi + \frac{\pi}{4}, n\pi + \tan^{-1}2; n \in \mathbb{Z}$

4)  $n\pi - \frac{\pi}{4}, n\pi + \tan^{-1}\left(\frac{1}{2}\right); n \in \mathbb{Z}$

24) If  $\alpha, \beta$  are the solutions of the equation  $\sin^{-1}x - \cos^{-1}x = \sin^{-1}(3x-2)$  and  $\alpha > \beta$  then  $3\alpha + 4\beta =$

1) 3

2) 4

3) 5

4) 6

25) If  $x = \log_e \left[ \cot \left( \frac{\pi}{4} + \theta \right) \right]$  where  $|\theta| < \frac{\pi}{4}$  then  $\sinh x =$

1)  $\sin 2\theta$

2)  $\cos 2\theta$

3)  $\tan 2\theta$

4)  $-\tan 2\theta$

26) In  $\Delta ABC$ , if  $A:B:C = 5:1:6$  then  $a:b:c =$

1)  $\sqrt{2}+1:\sqrt{2}-1:2\sqrt{2}$

2)  $\sqrt{3}-1:\sqrt{3}+1:2\sqrt{2}$

3)  $\sqrt{3}+1:\sqrt{3}-1:2\sqrt{2}$

4)  $\sqrt{3}-1:\sqrt{3}+1:1$

27) In any triangle ABC  $a \cdot \cos^2 \frac{A}{2} + b \cdot \cos^2 \frac{B}{2} + c \cdot \cos^2 \frac{C}{2} =$

1)  $\frac{\Delta}{R}$

2)  $s + \frac{\Delta}{R}$

3)  $2s + \frac{\Delta}{R}$

4)  $\frac{\Delta s}{R}$

28) If  $R = \frac{65}{8}$ ,  $r_1 = \frac{21}{2}$ ,  $r_2 = 12$  are the circum radius, radii of the excircles opposite to the vertices A and B of a triangle ABC respectively, then the area of the triangle (in square units) is

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

2) 28

3) 84

4) 168

29) The points with position vectors  $\bar{a} + \bar{b}$ ,  $\bar{a} - \bar{b}$  and  $\bar{a} + k\bar{b}$  are collinear

1) for exactly two values of  $k$

2) for exactly three values of  $k$

3) for no real value of  $k$

4) for all real value of  $k$

30) If A(4,7,8), B(2,3,4) and C(2,5,7) are the position vectors of the vertices of a triangle ABC and if the internal bisector of  $\angle A$  meets BC at D then AD =

1)  $\frac{3}{2}\sqrt{34}$       2)  $\frac{2}{3}\sqrt{34}$       3)  $\frac{1}{2}\sqrt{34}$       4)  $\frac{1}{6}\sqrt{34}$

31) Given  $\vec{a} = 2\vec{i} + \vec{j} - 2\vec{k}$  and  $\vec{b} = \vec{i} + \vec{j}$ . If  $\vec{c}$  is a vector such that  $\vec{a} \cdot \vec{c} = |\vec{c}|$ ,  $|\vec{c} - \vec{a}| = 2\sqrt{2}$  and the angle between  $\vec{a} \times \vec{b}$  and  $\vec{c}$  is  $30^\circ$ . Then the value of  $|(\vec{a} \times \vec{b}) \times \vec{c}|^2$  is

1) 9

2)  $\frac{4}{9}$

3)  $\frac{9}{4}$

4)  $\frac{27}{4}$

32) In a right angled triangle ABC, the hypotenuse  $|\vec{AB}| = P$  then  $\vec{AB} \cdot \vec{AC} + \vec{BC} \cdot \vec{BA} + \vec{CA} \cdot \vec{CB} =$

1)  $P^2$

2)  $2P^2$

3)  $3P^2$

4)  $\frac{P^2}{2}$

33) Let  $\vec{a} = 2\vec{i} + \vec{j} - \vec{k}$  and  $\vec{b} = \vec{i} + 3\vec{k}$

If  $\vec{c}$  is unit vector, then the maximum value of  $[\vec{a}, \vec{b}, \vec{c}]$  is

1)  $\sqrt{39}$

2)  $\sqrt{49}$

3)  $\sqrt{69}$

4)  $\sqrt{59}$

34) Let  $\vec{a} = 4\vec{i} + 5\vec{j} - \vec{k}$ ,  $\vec{b} = \vec{i} - 4\vec{j} + 5\vec{k}$ ,  $\vec{c} = 3\vec{i} + \vec{j} - \vec{k}$  and let  $\vec{\alpha}$  be a vector perpendicular to both  $\vec{a}$  and  $\vec{b}$  such that  $\vec{\alpha} \cdot \vec{c} = 63$  then  $\vec{\alpha} =$

1)  $7\vec{i} - 7\vec{j} - 7\vec{k}$

2)  $3\vec{i} - 3\vec{j} - 3\vec{k}$

3)  $21\vec{i} - 21\vec{j} - 21\vec{k}$

4)  $21\vec{i} - 7\vec{j} - 7\vec{k}$



35) Let  $a$  and  $b$  be two real numbers. If the arithmetic mean and the variance of  $a, b, 8, 5$  and  $10$  are respectively  $6$  and  $6.8$  then an ordered pair  $(a, b) =$

1)  $(3, 4)$

2)  $(1, 6)$

3)  $(7, 0)$

4)  $(-2, 9)$

36) The mean deviation from the mean of the data given below

Marks	10	15	20	25	30
No of students	2	4	6	8	5

1)  $5$

2)  $5.12$

3)  $5.25$

4)  $5.6$

37) Three faces of a fair die are yellow, two faces are red and one face is blue. If the die is tossed 3 times, then the probability that the colours yellow, red and blue appear is (need not to be in that order)

1)  $\frac{2}{9}$

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

3)  $\frac{5}{6}$

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

38) A college has to appear for two examinations A and B. The probabilities that the student passes in A and B are  $\frac{2}{3}$  and  $\frac{3}{4}$  respectively. If it is known that the student passes at least one among the two examinations, then the probability that the student will pass both the examinations is

1)  $\frac{1}{6}$

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

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

4)  $\frac{6}{11}$

39) If X is a random variable with the following probability distribution

X=x	-3	6	9
P(X=x)	$\frac{1}{6}$	$\frac{1}{2}$	$\frac{1}{3}$

1)  $\frac{65}{4}$

2)  $\frac{65}{2}$

3)  $\frac{65}{3}$

4) 65

40) 6 coins are tossed 320 times. The probability of getting 5 heads 2 times is

1)  $30^2 \times \frac{e^{-30}}{2}$

2)  $30 \times e^{-30}$

3)  $30^2 \times e^{-30}$

4)  $30 \times e^{-10}$

41) A(2, 3), B(3, -5) are two vertices of  $\Delta ABC$ . If the centroid of the  $\Delta ABC$  moves on the line  $2x+y-2=0$ , then the locus of C is

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

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

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

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

42) Let A = (2,0), B = (6,4) be two points. If  $\overline{AB}$  is rotated about A through an angle of  $45^\circ$  in the negative direction, then the co-ordinates of B after the rotation are

1)  $(2+4\sqrt{2}, 0)$

2)  $(2, 4\sqrt{2})$

3)  $(0, 4\sqrt{2})$

4)  $(4, \sqrt{2}, 0)$

43) If a straight line passing through the point P(2, 3) makes an angle  $\frac{\pi}{6}$  with the X-axis and meets the line  $12x + 5y + 10 = 0$  at Q, then the length of PQ is

1)  $\frac{132}{12\sqrt{3}+5}$

2)  $\frac{166}{8\sqrt{3}+6}$

3)  $\frac{182}{6\sqrt{3}+4}$

4)  $\frac{192}{14\sqrt{3}+6}$

44) A(3,-4) is a vertex of  $\Delta ABC$  and  $3x+4y-18=0$  is the perpendicular bisector of the side AB. If C =(6, 3) then the centroid of the triangle is

1)(6, 1)

2)(-6,1)

3)(-6,-1)

4)(6,-1)

45) If p and q are the lengths of the perpendiculars from the origin to the straight lines  $x \sec \alpha + y \operatorname{cosec} \alpha = 10$  and  $x \cos \alpha - y \sin \alpha = 10 \cos 2\alpha$ , then  $4p^2 + q^2 =$

1)10

2)20

3)40

4)100

46) If P is the set of all real numbers  $\alpha$  such that the product of the lengths of perpendiculars from  $(\alpha, 1)$  to the pair of straight lines  $3x^2+7xy+2y^2=0$  is  $\frac{\sqrt{2}}{5}$

1)  $\frac{-11}{3}$

2)  $\frac{-14}{3}$

3)  $\frac{11}{3}$

4)  $\frac{14}{3}$

47) If two of the lines represented by  $2x^2 + x^2y + y^3 = 0$  are mutually perpendicular then the slope of the third line is

1) 2

2) 1

3) 0

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

48) The orthocenter of the triangle formed by the lines  $2x^2 - 3xy + y^2$ ,  $x + y = 1$  is

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

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

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

4) (1,1)

49) A point which lies on the circle passing through the points (1,1), (-6, 0), (-2,2) is

1) (1,-6)

2) (9,1)

3) (-2,-8)

4) (1,2)

50) Let the tangents drawn from P(-1,-1) to the circle  $x^2$

$+y^2 - 2x - 4y - 4 = 0$  touch the circle at the points A and B. Then the area of the triangle PAB (in square units) is

1)  $\frac{24}{13}$

2)  $\frac{24}{7}$

3)  $\frac{8}{13}$

4)  $\frac{3}{13} 4^{\frac{2}{3}}$

51) If the chord of contact of  $P(x_1, y_1)$  with respect to the circles  $x^2 + y^2 = a^2$  meets the circle at A and B; then if  $\angle AOB = 90^\circ$  then  $x_1^2 + y_1^2 =$

1)  $a^2$

2)  $2a^2$

3)  $3a^2$

4)  $4a^2$

52) The point of concurrence of the polar of the variable point  $(2t, t-4)$ ,  $t \in \mathbb{R}$  with respect to the circle  $x^2 + y^2 - 4x - 6y + 1 = 0$  is

1) (1, 3)

2) (1, -3)

3) (-3, 1)

4) (3, 1)

53) ABC is a triangle and the radical centre of the circles with AB, BC, CA as the diameters is  $(-6, 5)$ . Now if  $A = (3, 2)$ ,  $B = (2, 1)$  then  $C =$

1) (1, 1)

2) (1, 2)

3) (2, 3)

4) (1, -2)

54) If the cosine of the angle between the two circles  $x^2 + y^2 + 2x + 4y - 3 = 0$  and  $x^2 + y^2 + 2kx - 2y - 1 = 0$  is  $\frac{1}{2\sqrt{3}}$  then  $k^2 =$

1) 2

2) 4

3) 16

4) 8

55) A = (-2, 0) and P is a point on the parabola  $y^2 = 8x$ . If Q bisects  $\overline{AP}$  and the locus of the Q is a parabola, then its focus is

1) (0, 0)

2) (1, 1)

3) (5, 0)

4) (4, 0)

56) Let S be the focus of the parabola  $y^2 = 4ax$  and PQ be a focal chord such that  $SP = \alpha$  and  $SQ = \alpha'$  Then  $\frac{1}{\alpha} + \frac{1}{\alpha'} =$

1) a

2)  $a^2$

3)  $\frac{1}{a}$

4)  $\frac{1}{a^2}$

57) The length of the latus rectum of  $9x^2 + 25y^2 - 90x - 150y + 225 = 0$  is

1)  $\frac{50}{3}$

2)  $\frac{18}{3}$

3)  $\frac{18}{25}$

4)  $\frac{9}{25}$

58) Let C be the centre of an ellipse and PQ be a chord of it with  $\angle PCQ = 90^\circ$ . If R is the point of intersection of the tangents to the ellipse at P and Q then R lies on

1) a straight line

2) a parabola

3) an ellipse

4) a hyperbola

59) The asymptotes of a hyperbola are parallel to  $2x+3y=0$  and  $3x+2y=0$ . The equation of that hyperbola whose centre is at  $(1,2)$  and passing through  $(5,3)$  is

1)  $(2x+3y-8)(3x+2y-7)-154=0$

2)  $(2x-3y-8)(3x-2y-7)-154=0$

3)  $(3x+2y-8)(2x-3y-7)-154=0$

4)  $(3x-2y+8)(2x+3y-7)-154=0$

60) In the triangle with vertices  $A(3, 2, 0)$ ,  $B(5, 3, 2)$  and  $C(-9, 6, -3)$ , the bisector of  $\angle BAC$  meets  $BC$  at  $D$ . The coordinates of  $D$  are

1)  $\left(\frac{57}{16}, \frac{38}{16}, \frac{17}{16}\right)$

2)  $\left(\frac{38}{16}, \frac{57}{16}, \frac{17}{16}\right)$

3)  $\left(\frac{38}{16}, \frac{17}{16}, \frac{57}{16}\right)$

4)  $\left(\frac{17}{16}, \frac{38}{16}, \frac{57}{16}\right)$

61) If the direction cosines of two lines are such that  $2l+m+2n=0$  and  $3l^2+5m^2-11n^2=0$ , then the angle between the two lines is

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

62) A plane passing through the points  $(2,3,-5)$  and  $(-3,-5,-7)$  is perpendicular to the plane  $x-y+z=1$ . A point that lies on the plane, among following is

1)  $(1,1,1)$

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

3)  $(1,4,4)$

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

63) If  $\lim_{x \rightarrow 0} \frac{e^{2x} - 1}{5x} = 1, \lim_{x \rightarrow 1} \frac{2}{x-1} \log x = m$ , then a cubic equation whose roots are  $5, m$  and  $1$ , is

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

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

3)  $x^3 - 5x^2 + 8x - 4 = 0$

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

64) Define  $f(x) = \begin{cases} \frac{1 - \sin x}{(\pi - 2x)^2}, & \text{if } x \neq \frac{\pi}{2} \\ k, & \text{if } x = \frac{\pi}{2} \end{cases}$ ,

If  $f(x)$  is continuous at  $x = \frac{\pi}{2}$ , then  $k =$

1)  $-\frac{1}{8}$

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

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

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

65) If  $y = x^x + x^7 + 7^x + 7^7$ , then  $\frac{dy}{dx} =$

1)  $x \cdot x^{x-1} + 7x^6 + x^{7x-1}$

2)  $x^x(1 + \log_e x) + 7x^6 + 7^x(\log_e 7)$

3)  $x^x(1 + \log_e x) + 7x^6 + x \cdot 7^{x-1}$

4)  $x \cdot x^{x-1} \log_e x + 7 \cdot x^6 + 7^x(\log_7 e)$



66) The derivative of  $e^{3x} \sin 4x$  with respect to  $x$ , is

1)  $5e^{3x} \sin\left(4x + \tan^{-1} \frac{4}{3}\right)$

2)  $5e^{3x} \sin\left(4x - \tan^{-1} \frac{4}{3}\right)$

3)  $5e^{3x} \sin\left(4x + \tan^{-1} \frac{3}{4}\right)$

4)  $5e^{3x} \sin\left(4x - \tan^{-1} \frac{3}{4}\right)$

67)  $y = a \cos x + (b+2x) \sin x \Rightarrow y^n + y =$

1)  $\cos x$

2)  $2 \cos x$

3)  $3 \cos x$

4)  $4 \cos x$

68) At any point for the curve  $3y^2 - (x+5)^3$ , if ST represents the length of the subtangent and SN represents the length of the subnormal then  $9(ST)^2 =$

1)  $8 SN$

2)  $\frac{8}{3} SN$

3)  $27 SN$

4)  $8 (SN)^2$

69) Let a kind of bacteria grow following the function  $f(t) = t^4$ ,  $t$  given in seconds. If the rate of growth of the bacteria after  $t_0$  seconds is 4000/second, then  $t_0 =$

1) 0

2) 10

3) 20

4) 30

70) The value of  $c$  for which the Lagrange's mean value theorem is applicable for the function  $f(x) = x(x+3)(x-2)$  in  $[-1, 4]$  is

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

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

3) 2

4)  $-\frac{8}{3}$

71) The radius (in cms) of the right circular cylinder of greatest curved surface area which can be inscribed in a given cone with radius 10cm is

1)  $\frac{\pi}{5}$

2)  $5\pi$

3) 20

4) 5

72)  $\int (\sqrt{\tan x} + \sqrt{\cot x}) dx =$

1)  $\sqrt{2} \tan^{-1} \left( \frac{\tan x + 1}{\sqrt{\tan x}} \right) + c$

2)  $\sqrt{2} \tan^{-1} \left( \frac{\tan x - 1}{\sqrt{2 \tan x}} \right) + c$

3)  $\frac{1}{\sqrt{2}} \tan^{-1} \left( \frac{\tan x + 1}{\sqrt{2 \tan x}} \right) + c$

4)  $\frac{1}{\sqrt{2}} \tan^{-1} \left( \frac{\sqrt{\tan x} - 1}{\sqrt{2 \tan x}} \right) + c$

73)  $\int \frac{3 \sin x - 5 \cos x}{7 \cos x + 2 \sin x} dx =$

1)  $-\frac{29}{53}x - \frac{31}{53} \log |7 \cos x + 2 \sin x| + c$

2)  $\frac{11}{51}x + \frac{41}{51} \log |7 \cos x + 2 \sin x| + c$

3)  $\frac{29}{53}x + \frac{31}{53} \log |3 \sin x - 5 \cos x| + c$

4)  $\frac{29}{51}x - \frac{51}{51} \log |7 \cos - 5 \cos x| + c$

74)  $\int \frac{1-x^7}{x(1+x^7)} dx = a \ln|x| + b \ln|x^7+1| + c \Rightarrow (a, b) =$

1)  $\left(1, \frac{2}{7}\right)$

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

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

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

75)  $\int \frac{6x^2-17x-5}{(x+5)(x-2)} dx =$

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

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

3)  $\log \frac{(x-2)^8}{(x-3)^2} - \frac{15}{x-2} + c$

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

76)  $\lim_{x \rightarrow \infty} \left[ \frac{1}{n} + \frac{1}{n+1} + \frac{1}{n+2} + \dots + \frac{1}{3n} \right] =$

1)  $\log 2$

2)  $\log 3$

3)  $\log 4$

4)  $\log 5$

77)  $\int_{-2}^3 |1-x^2| dx =$

1)  $\frac{28}{3}$

2)  $\frac{14}{3}$

3)  $\frac{7}{3}$

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

78)  $\int_0^{\pi} \frac{x \sin x}{1 + \cos^2 x} dx =$

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

2)  $\frac{\pi^2}{2}$

3)  $\frac{\pi^2}{3}$

4)  $\pi^2$

79) The differential equation corresponding to the family of circles given by  $(x-a)^2 + (y-b)^2 = 4$ , where a and b are parameters, is

1)  $4 \frac{d^2y}{dx^2} + 9y = 0$

2)  $4 \left( \frac{d^2y}{dx^2} \right)^2 + \left[ 1 \left( \frac{dy}{dx} \right)^2 \right]^3$

3)  $4 \frac{d^2y}{dx^2} + \left( \frac{dy}{dx} \right)^2 = 6y$

4)  $4 \left( \frac{d^2y}{dx^2} \right)^2 + \left( \frac{dy}{dx} \right)^2 = 6y$

80) The general solution of  $\cos^2 x \frac{dy}{dx} + y = \tan x$  is

1)  $ye^{\tan x} = (\tan x - 1)e^{\tan x} - \tan x + c$

2)  $ye^{\tan x} = (\tan x + 1)e^{\tan x} + \tan x + c$

3)  $ye^{\tan x} = (\tan x - 1)e^{\tan x} + c$

4)  $ye^{\tan x} = (\tan x - 1)e^{\tan x} + \tan x + c$

APEAMCET-2018 -- Engineering Stream			
Final Key			
Date: 24-04-18 FN (Shift 1)			
1	3	41	2
2	3	42	3
3	2	43	1
4	4	44	4
5	2	45	4
6	4	46	2
7	2	47	4
8	1	48	4
9	4	49	1
10	2	50	2
11	2	51	2
12	2	52	4
13	3	53	3
14	1	54	1
15	4	55	3
16	1	56	2
17	3	57	4
18	2	58	2
19	3	59	4
20	3	60	2
21	2	61	3
22	2	62	4
23	2	63	3
24	4	64	3
25	1	65	4
26	1	66	1
27	3	67	2
28	1	68	4
29	1	69	3
30	4	70	3
31	2	71	2
32	4	72	4
33	4	73	3
34	2	74	4
35	2	75	4
36	2	76	3
37	3	77	3
38	4	78	4
39	3	79	3
40	4	80	3