KALAIMAGAL MATRIC HIGHER SECONDARY SCHOOL, MOHANUR.

STD : XI | **MATHEMATICS** | **MARKS: 50**

DATE: | **ONE MARK TEST-IV (BB FULLY)** | **TIME: 30 min**

Choose the correct answer: **50 x 1 = 50**

1. The range of the function $\frac{1}{1-2\sin x}$ is

   1) $(-\infty,-1)\cup(\frac{1}{3},\infty)$ 2) $(-1,\frac{1}{3})$ 3) $[-1,\frac{1}{3}]$ 4) $(-\infty,-1]\cup[\frac{1}{3},\infty)$

2. The range of the function $f(x) = \left|\lfloor x\rfloor - x\right|, x\in R$ is

   1) [0,1] 2) [0, ∞) 3) [0,1) 4) (0,1)

3. The rule $f(x) = x^2$ is a bijection if the domain and the co – domain are given by

   1) R,R 2) R, $(0,\infty)$ 3) $(0, \infty)$, R 4) $[0,\infty),[0,\infty)$

4. The number of constant functions from a set containing m elements to a set containing n elements is

   1) mn 2) m 3) n 4) $m+n$

5. Find a so that the sum and product of the roots of the equation $2x^2+(a-3)x+3a-5=0$ are equal is

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

6. If a and b are the roots of the equation $x^2-kx+16=0$ and satisfy $a^2+b^2=32$, then the value of k is

   1) 10 2) −8 3) −8, 8 4) 6

7. The number of solutions of $x^2+|x-1|=1$ is

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

8. $\cos 2\theta \cos 2\phi + \sin^2(\theta-\phi) - \sin^2(\theta+\phi)$ is equal to

   1) $\sin 2(\theta+\phi)$ 2) $\cos 2(\theta+\phi)$ 3) $\sin 2(\theta-\phi)$ 4) $\cos 2(\theta-\phi)$

9. $\frac{\sin(A-B)}{\cos A\cos B}+\frac{\sin(B-C)}{\cos B\cos C}+\frac{\sin(C-A)}{\cos C\cos A}$ is

   1) sin A + sin B +sinC 2) 1 3) 0 4) cosA+cosB + cosC

10. If $\cos p\theta + \cos q\theta = 0$ and if $p\neq q$, then θ is equal to (n is any integer)

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

11. In a plane there are 10 points are there out of which 4 points are collinear, then the number of triangles formed is

    1) 110 2) ${}^{10}C_3$ 3) 10 ! 4) 116

12. ${}^{(n-1)}C_r + {}^{(n-1)}C_{(r-1)}$ is

    1) ${}^{(n+1)}C_r$ 2) ${}^{(n-1)}C_r$ 3) ${}^{n}C_r$ 4) ${}^{n}C_{r-1}$

13. If 10 lines are drawn in a plane such that no two of them are parallel and no three are concurrent , then the total number of point of intersection are

    1) 45 2) 40 3) 10 ! 4) 2^{10}

14. In ${}^{2n}C_3 : {}^{n}C_3 = 11:1$ then n is

    1) 5 2) 6 3) 11 4) 7

15. If S_n denotes the sum of n terms of an AP whose common difference is d, the value of $S_n - 2S_{n-1} + S_{n-2}$ is

1) d 2) 2d 3) 4d 4) d^2

16. The remainder when 38^{15} is divided by 13 is

1) 12 2) 1 3) 11 4) 5

17. The nth term of the sequence 1,2,4,7,11,… is

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

18. The point on the line $2x - 3y = 5$ is equidistance from (1,2) and (3,4) is

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

19. The image of the point (2,3) in the line $y = -x$ is

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

20. The length of $\perp$ from the origin to the line $\frac{x}{3} - \frac{y}{4} = 1$ is

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

21. The y intercept of the straight line passing through (1,3) and perpendicular to $2x - 3y + 1 = 0$ is

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

22. If $\Delta = \begin{vmatrix} a & b & c \\ x & y & z \\ p & q & r \end{vmatrix}$, then $\begin{vmatrix} ka & kb & kc \\ kx & ky & kz \\ kp & kq & kr \end{vmatrix}$ is

1) Δ 2) $k\Delta$ 3) $3k\Delta$ 4) $k^3\Delta$

23. A root of the equation $\begin{vmatrix} 3-x & -6 & 3 \\ -6 & 3-x & 3 \\ 3 & 3 & -6-x \end{vmatrix} = 0$ is

1) 6 2) 3 3) 0 4) –6

24. The value of the determinant of $|A| = \begin{bmatrix} 0 & a & -b \\ -a & 0 & c \\ b & -c & 0 \end{bmatrix}$ is

1) – 2abc 2) abc 3) 0 4) $a^2+b^2+c^2$

25. If x_1, x_2, x_3 as well as y_1, y_2, y_3 are in geometric progression with the same common ratio then the points (x_1, y_1) (x_2, y_2) , (x_3, y_3) are

1) vertices of an equilateral triangle 2) vertices of a right angled triangle
3)vertices of a right angled isosceles triangle 4) collinear

26. If $|\vec{a} + \vec{b}| = 60, |\vec{a} - \vec{b}| = 40$, and $|\vec{b}| = 46$ then $|\vec{a}|$ is

1) 42 2) 12 3) 22 4) 32

27. If $\vec{a}$ and $\vec{b}$ having same magnitude and angle between them is 60° and their scalar product is $\frac{1}{2}$ then $|\vec{a}|$ is

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

28. The value of $\theta \in \left(0, \frac{\pi}{2}\right)$ for which the vectors $\vec{a} = (\sin\theta)\hat{i} + (\cos\theta)\hat{j}$ and $\vec{b} = \hat{i} - \sqrt{3}\hat{j} + 2\hat{k}$ are perpendicular , is equal to

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

29. If $|\vec{a}|=13$, $|\vec{b}|=5$ and $\vec{a}.\vec{b} = 60$ then $|\vec{a} \times \vec{b}|$ is

1) 15 2) 35 3) 45 4) 25

30. $\lim_{x \to 0} \frac{\sin px}{\tan 3x} = 4$, then the value of p is

1) 6 2) 9 3)12 4) 4

31. $\lim_{\alpha \to \frac{\pi}{4}} \frac{\sin\alpha - \cos\alpha}{\alpha - \frac{\pi}{4}}$ is

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

32. $\lim_{n \to \infty} \left(\frac{1}{n^2} + \frac{2}{n^2} + \frac{3}{n^2} + \ldots\ldots \frac{n}{n^2}\right)$ is

1) $\frac{1}{2}$ 2) 0 3) 1 4) ∞

33. $\lim_{x \to 0} \frac{e^{\sin x} - 1}{x} =$

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

34. If $f(x) = x+2$, then $f'(f(x))$ at $x = 4$ is

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

35. If $y = \frac{(1-x)^2}{x^2}$, then $\frac{dy}{dx}$ is

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

36. If pv = 81 , then $\frac{dp}{dv}$ at v = 9 is

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

37. If $f(x) = \begin{cases} x-5 & if \quad x \le 1 \\ 4x^2 - 9 & if \quad 1 < x < 2 \\ 3x+4 & if \quad x \ge 2 \end{cases}$, then the right hand derivative of $f(x)$ at $x = 2$ is

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

38. $\int \frac{x^2 + \cos^2 x}{x^2 + 1} \operatorname{cosec}^2 x dx$ is

1) $\cot x + \sin^{-1}x + c$ 2) $-\cot x + \tan^{-1}x + c$ 3) $-\tan x + \cot^{-1} x + c$ 4) $-\cot x - \tan^{-1}x + c$

39. $\int x^2 \cos x \, dx$ is

1) $x^2 \sin x + 2x \cos x - 2\sin x + c$
2) $x^2 \sin x - 2x \cos x - 2\sin x + c$
3) $-x^2 \sin x + 2x \cos x + 2\sin x + c$
4) $-x^2 \sin x - 2x \cos x + 2\sin x + c$

40. $\int \sqrt{\frac{1-x}{1+x}}\, dx$ is

1) $\sqrt{1-x^2}+\sin^{-1}x+c$ 2) $\sin^{-1}x-\sqrt{1-x^2}+c$

3) $\log\left|x+\sqrt{1-x^2}\right|-\sqrt{1-x^2}+c$ 4) $\sqrt{1-x^2}+\log\left|x+\sqrt{1-x^2}\right|+c$

41. $\int \frac{dx}{e^x-1}$ is

1) $\log|e^x|-\log|e^x-1|+c$ 2) $\log|e^x|+\log|e^x-1|+c$

3) $\log|e^x-1|-\log|e^x|+c$ 4) $\log|e^x+1|-\log|e^x|+c$

42. An urn contains 5 red and 5 black balls. A ball is drawn at random , its colour is noted and is returned to the urn. Moreover , 2 additional balls of the colour drawn are put in the urn and then a ball is drawn at random. The probability that the second ball drawn is red will be

1) $\frac{5}{12}$ 2) $\frac{1}{2}$ 3) $\frac{7}{12}$ 4) $\frac{1}{4}$

43. A number x is chosen at random from the first 100 natural numbers. Let A be the event of numbers which satisfies $\frac{(x-10)(x-50)}{x-30}\geq 0$, then P(A) is

1) 0.20 2) 0.51 3) 0.71 4) 0.70

44. If two events A and B are independent such that $P(A)=0.35$ and $P(A\cup B)=0.6$, then P(B) is

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

45. If two events A and B are such that $P(\overline{A})=\frac{3}{10}$ and $P(A\cap \overline{B})=\frac{1}{2}$ then $P(A\cap B)$ is

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

46. If $\tan\alpha$ and $\tan\beta$ are the roots of $x^2+ax+b=0$, then $\frac{\sin(\alpha+\beta)}{\sin\alpha\sin\beta}$ is equal to

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

47. $\lim_{x\to 0}\frac{e^{\tan x}-e^x}{\tan x-x}=$

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

48. It is given that $f'(a)$ exists , then $\lim_{x\to a}\frac{xf(a)-af(x)}{x-a}$ is

1) $f(a)-af'(a)$ 2) $f'(a)$ 3) $-f'(a)$ 4) $f(a)+af'(a)$

49. $\int e^{-4x}\cos x\, dx$ is

1) $\frac{e^{-4x}}{17}[4\cos x-\sin x]+c$ 2) $\frac{e^{-4x}}{17}[-4\cos x+\sin x]+c$

3) $\frac{e^{-4x}}{17}[4\cos x+\sin x]+c$ 4) $\frac{e^{-4x}}{17}[-4\cos x-\sin x]+c$

50. If A and B are two events such that P(A) = 0.4, P(B) =0.8 and P(B/A) = 0.6 then $P(\overline{A}\cap B)$ is

1) 0.96 2) 0.24 3) 0.56 4) 0.66