

KALAIMAGAL MATRIC HIGHER SECONDARY SCHOOL, MOHANUR.

STD : XI

MATHEMATICS

MARKS: 50

DATE: 08.03.2023

ONE MARKS TEST-II (BB FULLY)

TIME: 30 min

Choose the correct answer:

50 x 1 = 50

1. Let A and B be subsets of the universal set N, the set of natural numbers. Then $A' \cup [(A \cap B) \cup B']$ is
 1) A 2) A' 3) B 4) N
2. The number of students who take both the subjects Mathematics and Chemistry is 70. This represents 10 % of the enrollment in Mathematics and 14 % of the enrollment in Chemistry . The number of students take at least one of these two subjects , is
 1) 1120 2) 1130 3) 1100 4) insufficient data
3. If $n((A \times B) \cap (A \times C)) = 8$ and $n(B \cap C) = 2$, then $n(A)$ is
 1) 6 2) 4 3) 8 4) 16
4. If $n(A) = 2$ and $n(B \cup C) = 3$, then $n[(A \times B) \cup (A \times C)]$ is
 1) 2^3 2) 3^2 3) 6 4) 5
5. The solution of $5x - 1 < 24$ and $5x + 1 > -24$ is
 1) (4,5) 2) (-5,-4) 3) (-5,5) 4) (-5,4)
6. The solution set of the following inequality $|x - 1| \geq |x - 3|$ is
 1) [0,2] 2) $[2, \infty)$ 3) (0,2) 4) $(-\infty, 2)$
7. The value of $\log_{\sqrt{2}} 512$ is
 1) 16 2) 18 3) 9 4) 12
8. $\left(1 + \cos\frac{\pi}{8}\right)\left(1 + \cos\frac{3\pi}{8}\right)\left(1 + \cos\frac{5\pi}{8}\right)\left(1 + \cos\frac{7\pi}{8}\right) =$
 1) $\frac{1}{8}$ 2) $\frac{1}{2}$ 3) $\frac{1}{\sqrt{3}}$ 4) $\frac{1}{\sqrt{2}}$
9. If $\pi < 2\theta < \frac{3\pi}{2}$, then $\sqrt{2 + \sqrt{2 + 2\cos 4\theta}}$ equals to
 1) $-2\cos\theta$ 2) $-2\sin\theta$ 3) $2\cos\theta$ 4) $2\sin\theta$
10. If $\tan 40^\circ = \lambda$, then $\frac{\tan 140^\circ - \tan 130^\circ}{1 + \tan 140^\circ \tan 130^\circ} =$
 1) $\frac{1 - \lambda^2}{\lambda}$ 2) $\frac{1 + \lambda^2}{\lambda}$ 3) $\frac{1 + \lambda^2}{2\lambda}$ 4) $\frac{1 - \lambda^2}{2\lambda}$
11. If $\frac{n+5}{2} P_{n+1} = \frac{11(n-1)}{2} n+3 P_n$, then the value of n are
 1) 7 and 11 2) 6 and 7 3) 2 and 11 4) 2 and 6
12. The product of r consecutive positive integers is divisible by
 1) $r!$ 2) $(r-1)!$ 3) $(r+1)!$ 4) r^r
13. The number of five digit telephone numbers having at least one of their digits repeated is
 1) 90000 2) 10000 3) 30240 4) 69760
14. If ${}^{a^2-a} C_2 = {}^{a^2-a} C_4$ then the value of 'a' is
 1) 2 2) 3 3) 4 4) 5
15. If ${}^n C_{10} > {}^n C_r$ for all possible r , then a value of n is
 1) 10 2) 21 3) 19 4) 20

16. If a is the arithmetic mean and g is the geometric mean of two numbers , then
 1) $a \leq g$ 2) $a \geq g$ 3) $a = g$ 4) $a > g$
17. If $(1+x^2)^2(1+x)^n = a_0 + a_1x + a_2x^2 + \dots + x^{n+4}$ and if a_0, a_1, a_2 are in AP, then n is
 1) 1 2) 2 3) 3 4) 4
18. The slope of the line which makes an angle 45° with the line $3x-y=-5$ are
 1) $1, -1$ 2) $\frac{1}{2}, -2$ 3) $1, \frac{1}{2}$ 4) $2, -\frac{1}{2}$
19. Equation of the straight line that forms an isosceles triangle with coordinate axes in the I quadrant with perimeter $4+2\sqrt{2}$ is
 1) $x+y+2=0$ 2) $x+y-2=0$ 3) $x+y-\sqrt{2}=0$ 4) $x+y+\sqrt{2}=0$
20. The coordinates of the four vertices of a quadrilateral are $(-2, 4), (-1, 2), (1, 2)$ and $(2, 4)$ taken in order.
 The equation of the line passing through the vertex $(-1, 2)$ and dividing the quadrilateral in the equal areas is
 1) $x+1=0$ 2) $x+y=1$ 3) $x+y+3=0$ 4) $x-y+3=0$
21. The intercepts of the perpendicular bisector of the line segment joining $(1, 2)$ and $(3, 4)$ with coordinate axes are
 1) $5, -5$ 2) $5, 5$ 3) $5, 3$ 4) $5, -4$
22. If $A = \begin{bmatrix} 1 & -1 \\ 2 & -1 \end{bmatrix}$, $B = \begin{bmatrix} a & 1 \\ b & -1 \end{bmatrix}$ and $(A+B)^2 = A^2 + B^2$, then the values of a and b are
 1) $a=4, b=1$ 2) $a=1, b=4$ 3) $a=0, b=4$ 4) $a=2, b=4$
23. If $A = \begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & -2 \\ a & 2 & b \end{bmatrix}$ is a matrix satisfying the equation $AA^T = 9I$, where I is 3×3 identity matrix, then the ordered pair (a, b) is equal to
 1) $(2, -1)$ 2) $(-2, 1)$ 3) $(2, 1)$ 4) $(-2, -1)$
24. If A is a square matrix, then which of the following is not symmetric?
 1) $A+A^T$ 2) AA^T 3) A^TA 4) $A-A^T$
25. If A and B are symmetric matrices of order n , where $(A \neq B)$, then
 1) $A+B$ is skew - symmetric 2) $A+B$ is symmetric
 3) $A+B$ is a diagonal matrix 4) $A+B$ is a zero matrix
26. A vector makes equal angle with the positive direction of the coordinate axes. Then each angle is equal to
 1) $\cos^{-1}\left(\frac{1}{3}\right)$ 2) $\cos^{-1}\left(\frac{2}{3}\right)$ 3) $\cos^{-1}\left(\frac{1}{\sqrt{3}}\right)$ 4) $\cos^{-1}\left(\frac{2}{\sqrt{3}}\right)$
27. The vectors $\vec{a}-\vec{b}$, $\vec{b}-\vec{c}$, $\vec{c}-\vec{a}$ are
 1) parallel to each other 2) unit vectors
 3) mutually perpendicular vectors 4) coplanar vectors
28. If ABCD is a parallelogram , then $\overrightarrow{AB} + \overrightarrow{AD} + \overrightarrow{CB} + \overrightarrow{CD}$ is equal to
 1) $2(\overrightarrow{AB} + \overrightarrow{AD})$ 2) $4\overrightarrow{AC}$ 3) $4\overrightarrow{BD}$ 4) \overrightarrow{O}
29. One of the diagonals of parallelogram ABCD with \vec{a} and \vec{b} as adjacent sides is $\vec{a}+\vec{b}$. The other diagonal \overrightarrow{BD} is
 1) $\vec{a}-\vec{b}$ 2) $\vec{b}-\vec{a}$ 3) $\vec{a}+\vec{b}$ 4) $\frac{\vec{a}+\vec{b}}{2}$

30. $\lim_{x \rightarrow \infty} \left(\frac{x^2 + 5x + 3}{x^2 + x + 3} \right)^x$ is
 1) e^4 2) e^2 3) e^3 4) 1
31. $\lim_{x \rightarrow \infty} \frac{\sqrt{x^2 - 1}}{2x + 1} =$
 1) 1 2) 0 3) -1 4) $\frac{1}{2}$
32. $\lim_{x \rightarrow 0} \frac{a^x - b^x}{x} =$
 1) $\log ab$ 2) $\log \left(\frac{a}{b} \right)$ 3) $\log \left(\frac{b}{a} \right)$ 4) $\frac{a}{b}$
33. $\lim_{x \rightarrow 0} \frac{8^x - 4^x - 2^x + 1^x}{x^2} =$
 1) $\log ab$ 2) $2(\log 2)^2$ 3) $\log 2$ 4) $3 \log 2$
34. If $y = \frac{1}{a-z}$, then $\frac{dy}{dz}$ is
 1) $(a-z)^2$ 2) $-(z-a)^2$ 3) $(z+a)^2$ 4) $-(z+a)^2$
35. If $y = \cos(\sin x^2)$, then $\frac{dy}{dx}$ at $x = \sqrt{\frac{\pi}{2}}$ is
 1) -2 2) 2 3) $-2\sqrt{\frac{\pi}{2}}$ 4) 0
36. If $y = mx+c$ and $f(0) = f'(0) = 1$, then $f(2)$ is
 1) 1 2) 2 3) 3 4) -3
37. If $f(x) = x \tan^{-1} x$, then $f'(1)$ is
 1) $1 + \frac{\pi}{4}$ 2) $\frac{1}{2} + \frac{\pi}{4}$ 3) $\frac{1}{2} - \frac{\pi}{4}$ 4) 2
38. $\int \frac{e^x(1+x)}{\cos^2(xe^x)} dx$ is
 1) $\cot(xe^x) + c$ 2) $\sec(xe^x) + c$ 3) $\tan(xe^x) + c$ 4) $\cos(xe^x) + c$
39. $\int \frac{\sqrt{\tan x}}{\sin 2x} dx$ is
 1) $\sqrt{\tan x} + c$ 2) $2\sqrt{\tan x} + c$ 3) $\frac{1}{2}\sqrt{\tan x} + c$ 4) $\frac{1}{4}\sqrt{\tan x} + c$
40. $\int \sin^3 x dx$ is
 1) $\frac{-3}{4} \cos x - \frac{\cos 3x}{12} + c$ 2) $\frac{3}{4} \cos x + \frac{\cos 3x}{12} + c$
 3) $\frac{-3}{4} \cos x + \frac{\cos 3x}{12} + c$ 4) $\frac{-3}{4} \sin x - \frac{\sin 3x}{12} + c$
41. $\int \frac{e^{6 \log x} - e^{5 \log x}}{e^{4 \log x} - e^{3 \log x}} dx$ is
 1) $x + c$ 2) $\frac{x^3}{3} + c$ 3) $\frac{3}{x^3} + c$ 4) $\frac{1}{x^2} + c$

42. Let A and B be two events such that $P(\overline{A \cup B}) = \frac{1}{6}$, $P(A \cap B) = \frac{1}{4}$ and $P(\overline{A}) = \frac{1}{4}$. Then the events A and B are

- 1) Equally likely but not independent 2) Independent but not equally likely

- 3) Independent and equally likely 4) Mutually inclusive and dependent

43. Two items are chosen from a lot containing twelve items of which four are defective, then the probability that atleast one of the item is defective

1) $\frac{19}{33}$

2) $\frac{17}{33}$

3) $\frac{23}{33}$

4) $\frac{13}{33}$

44. A man has 3 fifty rupee notes, 4 hundred rupees notes and 6 five hundred rupees notes in his pocket. If 2 notes are taken at random, what are the odds in favour of both notes being of hundred rupee denomination?

- 1) 1: 12 2) 12: 1 3) 13: 1 4) 1: 13

45. A letter is taken at random from the letters of the word ‘ASSISTANT’ and another letter is taken at random from the letters of the word ‘STATISTICS’. The probability that the selected letters are the same is

1) $\frac{7}{45}$

2) $\frac{17}{90}$

3) $\frac{29}{90}$

4) $\frac{19}{90}$

46. The value of $\log_3 \frac{1}{81}$ is

1) -2

2) -8

3) -4

4) -9

47. If $f(x) = x (-1)^{\left\lfloor \frac{1}{x} \right\rfloor}$, $x \leq 0$, then the value of $\lim_{x \rightarrow 0^-} f(x)$ is equal to

1) -1

2) 0

3) 2

4) 4

48. $\frac{d}{dx}(e^{x+5 \log x})$ is

1) $e^x x^4(x+5)$

2) $e^x x(x+5)$

3) $e^x + \frac{5}{x}$

4) $e^x - \frac{5}{x}$

49. $\int \frac{\sec x}{\sqrt{\cos 2x}} dx$ is

1) $\tan^{-1}(\sin x) + c$

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

3) $\tan^{-1}(\cos x) + c$

4) $\sin^{-1}(\tan x) + c$

50. A matrix is chosen at random from a set of all matrices of order 2, with elements 0 or 1 only. The probability that the determinant of the matrix chosen is non zero will be

1) $\frac{3}{16}$

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

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

4) $\frac{5}{8}$