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1. The relation R = {(1, 1), (2, 2), (3, 3), (1, 2) (2, 3,), (1, 3)} on set A = {1, 2, 3} is;
(a) reflexive but not symmetric
(b) reflexive but not transitive.
(c) symmetric and transitive.
(d) neither symmetric nor transitive.

2. If R is a relation on a finite set having 'n' elements, then the numbers of relations on A is;
(a) 2^n (b) 2^{n^2}
(c) n^2 (d) n^n

3. Let R be a reflexive relation on a finite set A having n-elements and let there be 'm' ordered pairs in R. Then;
(a) $m \geq n$ (b) $m \leq n$
(c) $m = n$ (d) none of these

4. If $\left(\frac{3}{2}+\frac{i\sqrt{3}}{2}\right)^{50} = 3^{25}(x+iy)$ where 'x' and 'y' are reals then the ordered pairs (x, y) is given by;
(a) (0, 3) (b) $\left(\frac{1}{2}, \frac{\sqrt{3}}{2}\right)$
(c) (–3, 0) (d) (0, – 3)

5. If $|z| < \sqrt{2} - 1$, then $|z^2 + 2z\cos\alpha|$ is;
(a) less than 1 (b) $\sqrt{2}+1$
(c) $\sqrt{2}-1$ (d) none of these

6. If |z| = 3, then the points representing the complex number $-1 + 4z$ lies on a;
(a) line (b) circle
(c) parabola (d) none of these

7. If $\log_x a$, $a^{1/2}$ and $\log_b x$ are in G.P. then 'x' is equal to;
(a) $\log_a(\log_b a)$
(b) $\log_a(\log_c a) + \log_a(\log_c b)$
(c) $-\log_a(\log_b b)$
(d) $\log_a(\log_c b) - \log_a(\log_c a)$

8. Let a, b, c be in A.P. and |a| < 1, |b|<1, |c| < 1. If –
$x = 1 + a + a^2 + \ldots$.to ∞
$y = 1 + b + b^2 + \ldots$.to ∞
$z = 1 + c + c^2 + \ldots$.to ∞
then x, y, z are in;
(a) AP (b) GP
(c) HP (d) none of these

9. Let $a_1, a_2, \ldots, a_{10}$ be in AP and $h_1, h_2, \ldots, h_{10}$ be in HP. If $a_1 = h_1 = 2$ and $a_{10} = h_{10} = 3$, then a_4h_7 is;
(a) 2 (b) 3
(c) 5 (d) 6

10. If a, b, c are in GP, then the equations $ax^2 + 2bx + c=0$ and $dx^2 + 2ex + f = 0$ have a common root if d/a, e/f, f/c are in;
(a) AP (b) GP
(c) HP (d) none of these

11. If the product of the roots of the equation $x^2 - 2\sqrt{2}kx + 2e^{2\ln k} - 1 = 0$ is 31, then the roots of the equations are real for 'k' equal to;
(a) 1 (b) 2
(c) 3 (d) 4

12. The roots of the equation, $(a+\sqrt{b})^{a^2-b} + (a-\sqrt{b})^{a^2-b} = 2a$, where $a^2 - b = 1$ are;
(a) $\pm 2 \pm \sqrt{3}$ (b) $\pm 4 \pm \sqrt{14}$
(c) $\pm 3 \pm \sqrt{5}$ (d) $\pm 6 \pm \sqrt{20}$

13. The quadratic equation whose roots are A.M. and between the; roots of the equation $ax^2 + bx + c = 0$ is;
(a) $abx^2 + (b^2 + ac)x + bc = 0$
(b) $2abx^2 + (b^2 + 4ac)x + 2bc = 0$
(c) $2abx^2 + (b^2 + ac)x + bc = 0$
(d) none of these

14. The value of $\sqrt{8+2\sqrt{8+2\sqrt{8+2\sqrt{8+2\sqrt{8}}}}}$ is;
(a) 10 (b) 6
(c) 8 (d) 4

15. If $x^2 - 2x\cos\theta + 1 = 0$, then the value of $x^{2n} - 2x^n\cos n\theta + 1$ is equal to;

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(a) $\cos 2n\theta$
(b) $\sin 2n\theta$
(c) 0
(d) some real number other than 0

16. If a, b, $c \in R$ and $a+b+c=0$, then the quadratic equation $4ax^2+3bx+2c=0$ has;
(a) one positive and one negative roots.
(b) imaginary roots.
(c) real roots.
(d) none of these.

17. The number of ways in which one can post 5 letters in 2 letter boxes is;
(a) 35 (b) ${}^5P_2$
(c) 7^5 (d) none of these

18. The value of $1^2.C_1+3^2.C_2-5^2.C_3+\ldots$ is;
(a) $n(n-1)2^{n-2}+n\cdot 2^{n-1}$ (b) $n(n-1)2^{n-2}$
(c) $n(n-1)\cdot 2^{n-3}$ (d) none of these

19. If the expression of $(1+x)^m(1-x)^n$, the coefficients of 'x' and x^2 are 3 and –6 respectively, then 'm' is;
(a) 6 (b) 9
(c) 12 (d) 24

20. If $g(f(x))=|\sin x|$ and $f(g(x))=(\sin\sqrt{x})^2$, then;
(a) $f(x)\sin^2 x$, $g(x)=\sqrt{x}$
(b) $f(x)=\sin x$, $g(x)=|x|$
(c) $f(x)=x^2$, $g(x)=\sin\sqrt{x}$
(d) 'f' and 'g' cannot be determined.

21. The sum of 'n' terms of the series $\frac{1}{2}+\frac{3}{4}+\frac{7}{8}+\frac{15}{16}+\ldots$ is;
(a) 2^n-n-1 (b) $1-2^n$
(c) $n+n^{-n}-1$ (d) 2^n-1

22. If the equations $x^2+px+q=0$ and $x^2+p'x+q'=0$ have a common root, then it is equal to;
(a) $\frac{p-p'}{q-q'}$ (b) $\frac{p+p'}{q+q'}$
(c) $-\left(\frac{q-q'}{p-q'}\right)$ (d) $\frac{q+q'}{p+q'}$

23. The number of ways in which 'n' distinct objects can be put into two different boxes so that no box remains empty, is;
(a) 2^n-1 (b) n^2-1
(c) 2^n-2 (d) n^2-2

24. The coefficient of x^5 in the expression of $(1+x^2-x^3)^8$ is;
(a) 80 (b) 84
(c) 88 (d) 92

25. If ${}^nC_4$, ${}^nC_5$, ${}^nC_6$ are in A.P., then 'n' is equal to;
(a) 12 (b) 11
(c) 7 (d) 8

26. If A is a square matrix or order n×n, then adj(adj A) is equal to;
(a) $|A|^n A$ (b) $|A|^{n-1} A$
(c) $|A|^{n-2} A$ (d) $|A|^{n-3} A$

27. If $X=\begin{bmatrix}3 & -4\\ 1 & -1\end{bmatrix}$, the value of X^n is;
(a) $\begin{bmatrix}3 & -4n\\ n & -n\end{bmatrix}$ (b) $\begin{bmatrix}2+n & 5-n\\ n & -n\end{bmatrix}$,
(c) $\begin{bmatrix}3^n & (-4)^n\\ 1^n & (-1)^n\end{bmatrix}$ (d) none of these

28. If ω be one of the roots of unity, then $\begin{vmatrix}1 & \omega & \omega^2\\ \omega & 1 & \omega^2\\ \omega^2 & \omega & 1\end{vmatrix}=$
(a) ω (b) ω^2
(c) 0 (d) 1

29. If

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$0 < \theta < \frac{\pi}{2}$ and $\begin{vmatrix} 1+\sin^2\theta & \cos^2\theta & 4\sin 4\theta \\ \sin^2\theta & 1+\cos^2\theta & 4\sin 4\theta \\ \sin^2\theta & \cos^2\theta & 1+4\sin 4\theta \end{vmatrix} = 0$

then θ is equal to;

(a) $\frac{\pi}{24}, \frac{5\pi}{24}$ (b) $\frac{5\pi}{24}, \frac{7\pi}{24}$

(c) $\frac{7\pi}{24}, \frac{11\pi}{24}$ (d) none of these

30. If A and B are two matrices such that AB = B and BA = A, then $A^2 + B^2$ =

(a) 2AB (b) 2BA

(c) A + B (d) AB

31. The circle whose equation are $x^2 + y^2 + c^2 = 2ax$ and $x^2 + y^2 + c^2 - 2by = 0$ will touch on another externally if;

(a) $\frac{1}{b^2} + \frac{1}{c^2} = \frac{1}{a^2}$ (b) $\frac{1}{c^2} + \frac{1}{a^2} = \frac{1}{b^2}$

(c) $\frac{1}{a^2} + \frac{1}{b^2} = \frac{1}{c^2}$ (d) none of these

32. The two circle $x^2 + y^2 - 2x - 3 = 0$ and $x^2 + y^2 - 4x - 6y - 8 = 0$ are such that;

(a) they touch each other.

(b) they intersect each other.

(c) one lies inside the other.

(d) each lies outside the other.

33. The equation of the normal to the parabola $y^2 = 8x$ having slope 1 is;

(a) x + y + 6 = 0 (b) x − y − 6 = 0

(c) x − y + 6 = 0 (d) x + y − 6 = 0

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

(a) 1 (b) 2

(c) 3 (d) 4

35. P is a variable point on the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ with AA' as the major axis. Then the maximum value of the area of the triangle AP'A is;

(a) ab (b) 2ab

(c) ab/2 (d) none of these

36. An ellipse is described by using an endless string which is passed over two pins. If the axes are 6 cm and 4cm, then necessary length of the string and the distance between the pins respectively in cms, are;

(a) 6, $2\sqrt{5}$ (b) 6, $\sqrt{5}$

(c) 4, $2\sqrt{5}$ (d) none of these

37. If 'e' and e_1 are the eccentricities of the hyperbolas $xy = c^2$ and $x^2 - y^2 = c^2$, then $e^2 + e_1^2$ is equal to;

(a) 1 (b) 4

(c) 6 (d) 8

38. The comb equation of the asymptotes of the hyperbola $2x^2 + 5xy + 2y^2 + 4x + 5y = 0$;

(a) $2x^2 + 5xy + 2y^2 + 4x + 5y + 2 = 0$

(b) $2x^2 + 5xy + 2y^2 + 4x + 5y - 2 = 0$

(c) $2x^2 + 5xy + 2y^2 = 0$

(d) none of these

39. If $f : R \to R$ is given by f(x) = 3x − 5, then f'(x) is given by;

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

(b) $\frac{x+5}{3}$

(c) does not exist because if is not one-one

(d) does not exist because 'f' is not onto.

40. Let $f(x) = \begin{cases} x^n \sin\frac{1}{x}, & x \neq 0 \\ 0, & x = 0 \end{cases}$. Then f(x) is continuous but not differentiable at x = 0, if;

(a) $n \in (0, 1]$ (b) $n \in [1, \infty)$

(c) $n \in (-\infty, 0)$ (d) n = 0

41. Let g(x) be the inverse of the function f(x) and $f'(x) = \frac{1}{1+x^3}$. Then g'(x) is equal to;

(a) $\frac{1}{1+(g(x))^3}$ (b) $\frac{1}{1+(f(x))^3}$

(c) $1+(g(x))^3$ (d) $1+(f(x))^3$

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42. If $f(x) = \cot^{-1}\left(\frac{x^x - x^{-x}}{2}\right)$, then $f'(1)$ equals;

(a) -1 (b) 1
(c) $\log 2$ (d) $-\log 2$

43. If $f(x) = \log_x(\ln(x))$, then $f'(x) =$ at $x = e$ is;

(a) e (b) $-e$
(c) e^2 (d) e^{-1}

44. If $F(x) = \frac{1}{x^2}\int_4^x (4t^2 - 2F'(t))dt$, then $F'(4)$ equals;

(a) $\frac{32}{9}$ (b) $\frac{64}{3}$
(c) $\frac{64}{9}$ (d) none of these

45. If $x^p y^q = (x+y)^{p+q}$, then $\frac{dy}{dx}$ is equal to;

(a) $\frac{y}{x}$ (b) $\frac{py}{qx}$
(c) $\frac{x}{y}$ (d) $\frac{qy}{px}$

46. If $y = \sec^{-1}\left(\frac{x+1}{x-1}\right) + \sin^{-1}\left(\frac{x-1}{x+1}\right)\frac{dy}{dx}$ is;

(a) 1 (b) $\left(\frac{x-1}{x+1}\right)$
(c) 0 (d) $\left(\frac{x+1}{x-1}\right)$

47. Let (x) = x – [x], fore every real number x, where [x] is integral part of 'x'. Then $\int_1^3 f(x)dx$ is;

(a) 1 (b) 2
(c) 0 (d) 1/2

48. If $I_1 = \int_e^{e^2} \frac{dx}{\log x}$ and $I_2 = \int_1^2 \frac{e^x}{x}dx$, then;

(a) $I_1 = I_2$ (b) $2I_1 = I_2$
(c) $I_1 = 2I_2$ (d) none of these

49. The value of the integral $\int_0^{\pi/2} \log|\tan x + \cot x|\, dx$ is;

(a) $\pi \log 2$ (b) $-\pi \log 2$
(c) $\pi \log 3$ (d) none of these

50. If f(x) is a function satisfying $f\left(\frac{1}{x}\right) + x^2 f(x) = 0$ for all non-zero x, then $\int_{\sin\theta}^{\operatorname{cosec}\theta} f(x)dx$ equals;

(a) $\sin\theta + \operatorname{cosec}\theta$ (b) $\sin^2\theta$
(c) $\operatorname{cosec}^2\theta$ (d) none of these

51. The order and degree the differential equation of all tangent lines to the parabola $x^2 = 4y$ is;

(a) 1, 2 (b) 2, 2
(c) 3, 1 (d) 4, 1

52. A solution of the differential equation $\left(\frac{dy}{dx}\right)^2 - x\frac{dy}{dx} + y = 0$ is;

(a) $y = 2$ (b) $y = 2x$
(c) $y = 2x - 4$ (d) $y = 2x^2 - 4$

53. The differential equation representing the family of curves $y = 2c(x + \sqrt{c})$, where 'c' is a positive parameter is of;

(a) order 1 (b) order 2
(c) degree 3 (d) both (a) and (c)

54. If $\vec{a} = x(\vec{a}\times\vec{b}) + y(\vec{b}\times\vec{c}) + z(\vec{c}\times\vec{a})$ and $[\vec{a}\ \vec{b}\ \vec{c}] = \frac{1}{8}$, they x + y + z =

(a) $8\vec{a}.(\vec{a}+\vec{b}+\vec{c})$ (b) $\vec{a}.(\vec{a}+\vec{b}+\vec{c})$
(c) $8(\vec{a}+\vec{b}+\vec{c})$ (d) none of these

55. If the vector $-\hat{i}+\hat{j}-\hat{k}$ bisects the angle between the vector $\vec{c}$ and the vector $3\hat{i}+4\hat{j}$, then the unit vector in the direction of $\vec{c}$ is;

(a) $\frac{1}{15}(11\hat{i}+10\hat{j}+2\hat{k})$ (b) $-\frac{1}{15}(11\hat{i}-10\hat{j}+2\hat{k})$

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(c) $-\frac{1}{15}(11\hat{i}+10\hat{j}-2\hat{k})$ (d) $-\frac{1}{15}(11\hat{i}+10\hat{j}+2\hat{k})$

56. If $\vec{a}, \vec{b}$ are unit vectors such that the vector $\vec{a}+3\vec{b}$ is perpendicular to $7\vec{a}-5\vec{b}$ and $\vec{a}-4\vec{b}$ is perpendicular to $7\vec{a}-2\vec{b}$, then the angle between $\vec{a}$ and $\vec{b}$ is;

(a) $\frac{\pi}{6}$ (b) $\frac{\pi}{4}$

(c) $\frac{\pi}{3}$ (d) $\frac{\pi}{2}$

57. Twelve balls are distributed among three boxes. The probability that the first box contains 3 balls is;

(a) $\frac{110}{9}\left(\frac{2}{3}\right)^{10}$ (b) $\frac{9}{110}\left(\frac{2}{3}\right)^{10}$

(c) $\frac{{}^{12}C_3}{12^3}$ (d) $\frac{{}^{12}C_1}{3^{12}}$

58. If A and B are two events such that $P(A) > 0$ and $P(B) \neq 1$, then $P(\bar{A}/\bar{B})$ is equal to;

(a) $1-P(A/B)$ (b) $1-P(\bar{A}/B)$

(c) $\frac{1-P(A\cup B)}{(B)}$ (d) $\frac{P(\bar{A})}{P(\bar{B})}$

59. A coin is tossed (m + n) times, (m > n). Then the probability of at least 'm' consecutive heads is;

(a) $\frac{n+2}{2^{m+1}}$ (b) $\frac{n+1}{2^{m+1}}$

(c) $\frac{n+1}{2^{m+2}}$ (d) none of these

60. Let ABC be a triangle such that $\angle A = 45^0$, $\angle B = 75^0$, then $a+c\sqrt{2}$ is equal to;

(a) 0 (b) b

(c) 2b (d) –b

61. In any triangle ABC, if $\sin^2 A+\sin^2 B=\sin^2 C$ then the triangle is;

(a) equilateral (b) right-angled

(c) isosceles (d) none of these

62. The smallest angle of the triangle whose sides are $6+\sqrt{12}, \sqrt{48}, \sqrt{24}$ is;

(a) $\frac{\pi}{3}$ (b) $\frac{\pi}{4}$

(c) $\frac{\pi}{6}$ (d) none of these

63. $\int[f(x)g'''(x)-f'''(x)g(x)]\,dx$ is equal to;

(a) $\frac{f(x)}{g'(x)}$ (b) $f'(x)g(x)-f(x)g'(x)$

(c) $f(x)g(x)-f'(x)g(x)$ (d) $f(x)g'(x)+f'(x)g(x)$

64. $\int e^{3\log x}(x^4+1)^{-1}\,dx$ is equal to;

(a) $\log(x^4+1)+C$ (b) $\frac{1}{4}\log(x^4+1)+C$

(c) $-\log(x^4+1)+C$ (d) none of these

65. $\int\frac{x+2}{(x^2+3x+3)\sqrt{x+1}}dx$ is equal to;

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

(c) $\frac{2}{\sqrt{3}}\tan^{-1}\left(\frac{x}{\sqrt{(x+1)}}\right)$ (d) none of these

66. If $\lim_{x\to a}\frac{a^x-x^a}{x^x-a^a}=-1$, then the value of 'a' is;

(a) 1 (b) 0

(c) e (d) none of these

67. Evaluate the following limits $\lim_{x\to 0}(\cos x)^{\cot x}$

(a) 0 (b) 1

(c) –1 (d) none of these

68. If $(1+x)^n = C_0+C_1x+C_2x^2+\ldots+C_nx^n$, then $C_1^2+C_2^2+\ldots+C_n^2$ is equal to;

(a) 2^{2n-2} (b) 2^n

(c) $\frac{(2n)!}{2(n!)^2}$ (d) $\frac{(2n)!}{(n!)^2}$

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69. If the radius of the circumcircle of an isosceles triangle PQR is equal to PQ = (=PR), then the angle P is;

(a) $\frac{\pi}{6}$ (b) $\frac{\pi}{3}$

(c) $\frac{\pi}{2}$ (d) $\frac{2\pi}{3}$

70. Identify the curve $y^2 - x^2 + 2ax - 1 = 0$;

(a) pair of straight line (b) circle

(c) ellipse (d) parabola

71. The value of $\tan^{-1}(1) + \sin^{-1}\left(\frac{-1}{2}\right) + \cos^{-1}\left(\frac{-1}{20}\right) = ?$

(a) $\frac{3\pi}{4}$ (b) $\frac{\pi}{2}$

(c) $\frac{5\pi}{4}$ (d) none of these

72. Period of function $f(x) = |\sin \pi x|$ is;

(a) π (b) π^2

(c) 1 (d) 2

73. Domain of the function $2^x + 2^{|x|} = 2$ is;

(a) $(-\infty, 0]$ (b) $(-\infty, 1)$

(c) $(0, \infty)$ (d) $(1, \infty)$

74. The digit of unit place of $1! + 2! + 3! + 4! + \ldots$

(a) 3 (b) 4

(c) 7 (d) 8

75. The number of values of 'x' in the interval $[0, 5\pi]$ satisfying the equation $3\sin^2 x - 7\sin x + 2 = 0$;

(a) 5 (b) 6

(c) 0 (d) 8

76. The solution of the trigonometric equation $1 - \cos\theta = \sin\theta / 2.\sin\theta$ where $\theta = ?$

(a) $\theta = k\pi,\ k \in I$ (b) $\theta = 2k\pi,\ k \in I$

(c) $\theta = 2k\pi + \pi/2$ (d) none of these

77. If $\frac{dy}{dx} = e^{-2y}$, given y = 0 when x=5 then the value of 'x' for y=3 is;

(a) e^7 (b) $e^5 + 1$

(c) $\frac{e^6 + 9}{2}$ (d) $\log_e 6$

78. $\int x \log\left(1 + \frac{1}{x}\right) dx = f(x)\log(1+x) + g(x)x^2 + Lx + c$;

(a) $f(x) = \frac{x^2}{2}$ (b) $g(x) = \log x$

(c) L = 1 (d) none of these

79. Range of the function $|\sin 2x - \cos 2x|$;

(a) $(-\infty, \infty)$ (b) $(-4, 4)$

(c) $[-2, 2]$ (d) $[-1, 1]$

80. If $\begin{vmatrix} a & b & c \\ b & c & a \\ c & a & b \end{vmatrix} = -(a+b+c)(a+bk+ck^2)(a+bx^2+ck)$

then the value of 'k', where ω is complex cube root of unity (a, b, c $\in$ R);

(a) ω (b) ω^2

(c) 1 (d) $-\omega$

81. $\int_{\pi/4}^{3\pi/4} \frac{1}{1+\cos x} dx = ?\ C$

(a) 2 (b) -2

(c) $-\frac{1}{2}$ (d) $\frac{1}{2}$

82. Odd One Out;

(a) MATHS (b) TRIGONOMETRY

(c) GEOMETRY (d) ALGEBRA

83. Odd One Out;

(a) ARC (b) TANGENT

(c) DIAGONAL (d) DIAMETER

84. INFLUENZA : VIRUS :: TYPHOID : ?

(a) BACILLUS (b) PARASITE

(c) PROTOZOA (d) BACTERIA

85. What is the angle between hour hand and minute hand at 10 past 5 ?

(a) 90° (b) 95°

(c) 98° (d) 100°

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86. If number of boys in a class is 3 times the number of girls which cannot be the total number of student;
(a) 44 (b) 48
(c) 42 (d) 40

87. If 2 workers complete work in 10 days and 15 days respectively then in how many days will they complete the work together;
(a) 6 (b) 5
(c) 7 (d) 9

88. The next term of the series, 7, 13, 25, 49, ... ?
(a) 96 (b) 97
(c) 98 (d) 99

89. How many such pairs of letter are there in the word COMPUTERS each of which have as many letters between them in the word as in the alphabet;
(a) 1 (b) 2
(c) 3 (d) more than 3

90. In what ratio water and 66% solution of wine is mixed to get the 55% solution of wine;
(a) 2 : 5 (b) 1 : 4
(c) 1 : 5 (d) 1 : 6

91. How much does a watch loose per day if its hand coincides every 64 minutes;
(a) 90 minute (b) 96 minute
(c) $32\frac{8}{11}$ (d) $36\frac{5}{11}$

92. If $x = 2+\sqrt{3}$ and $xy = 1$ than find the value of $\frac{x}{\sqrt{2}+\sqrt{x}} + \frac{y}{\sqrt{2}-\sqrt{y}}$ is;
(a) 1 (b) 0
(c) $\sqrt{2}$ (d) none of these

93. Two trains start from station A at 9 : 00 am and 8 : 30 am with the speed of 90 km /h and 80 km/h respectively then how much distance from station A the both trains will meet together;
(a) 270 km (b) 820 km
(c) 360 km (d) 400 km

94. A bag contains coin of 25 paise, 50 paise and 1 rupees and the sum of money is rupees 35 then find the total number of coins of each type;
(a) 20 (b) 25
(c) 30 (d) 33

95. If 4th day after 6th January is SATURDAY then what will be the day on 1st December in the previous year;
(a) THURSDAY (b) FRIDAY
(c) SATURDAY (d) SUNDAY

96. If Curd : Milk then which of the following show similar relationship;
(a) clot : Blood (b) Flow : River
(c) Decant : Wine (d) Coffee : Brew

97. A man is facing south be turns 135° anticlockwise than 180° clockwise. How in which direction is he facing ?
(a) NORTH-EAST (b) NORTH-WEST
(c) SOUTH-EAST (d) SOUTH-WEST

98. Solution of equation $\begin{vmatrix} \cos\theta & \sin\theta & \cos\theta \\ -\sin\theta & \cos\theta & \sin\theta \\ -\cos\theta & -\sin\theta & \cos\theta \end{vmatrix} = 0$ then θ equal to:
(a) $2n\pi \pm \frac{\pi}{2}$ (b) $n\pi$
(c) $n\pi + \frac{\pi}{2}$ (d) none of these

99. A wheel has circumference $4\frac{2}{7}$m and it makes 7 revolution 4 seconds then find the speed of car in km/h ?
(a) 27 (b) 67
(c) 37 (d) 47

100. The sum of the coefficient of all the integral powers of 'x' in the expansion of $(1+2\sqrt{x})^{40}$ is;
(a) $3^{40}+1$ (b) $3^{40}-1$
(c) $\frac{1}{2}(3^{40}-1)$ (d) $\frac{1}{2}(3^{40}+1)$

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101. $\int \frac{1}{x(x^n+1)}dx$ is equal to;

(a) $\frac{1}{n}\log\left(\frac{x^n}{x^n+1}\right)+C$ (b) $\frac{1}{n}\log\left(\frac{x^n+1}{x^n}\right)+C$

(c) $\log\left(\frac{x^n}{x^n+1}\right)+C$ (d) none of these

102. In order that a relation R defined on a non-empty set A is an equivalence relation, it is sufficient, if R;

(a) is reflexive
(b) is symmetric
(c) is transitive
(d) possess all the above three properties

103. If $f(x)=\begin{cases} xe^{-\left(\frac{1}{|x|}+\frac{1}{x}\right)} & x\neq 0 \\ 0 & x=0 \end{cases}$ then f(x) is;

(a) continuous for all 'x' but not differentiable at x=0.
(b) neither differentiable nor continuous at x=0.
(c) discontinuous everywhere.
(d) continuous as well as differentiable at x=0

104. There are 'n' different books and 'p' copies of each. The number of ways in which a selection can be made from them is;

(a) n^p (b) p^n
(c) $(p+1)^n-1$ (d) $(n+1)^p-1$

105. If $A=\begin{bmatrix} 1 & 2 & 2 \\ 2 & 2 & -2 \\ a & 2 & b \end{bmatrix}$ is a matrix satisfying the equation AA = 9I, where I is 3×3 identity matrix, then the a + b is equal to;

(a) –3 (b) 3
(c) 2 (d) 1

106. If 'z' is a complex number having least absolute value is |z – 2 + 2i| = 1, then z =

(a) $\left(2-\frac{1}{\sqrt{2}}\right)(1-i)$ (b) $\left(2-\frac{1}{\sqrt{2}}\right)(1+i)$
(c) $\left(2+\frac{1}{\sqrt{2}}\right)(1-i)$ (d) $\left(2+\frac{1}{\sqrt{2}}\right)(1+i)$

107. A number is selected from a first 120 natural number. Then the probability that the number is divisible by 5 or 15 is;

(a) 1/5 (b) 1/6
(c) 23/120 (d) 1/8

108. Inverse of which function is exist;

(a) $f(x)=\frac{1}{1-x}$ for all $x\in R$
(b) $f(x)=x^2$ for all $x\in R$
(c) $f(x)=x^2$ for all $x\geq 0$
(d) $f(x)=x^2$ for all $x\leq 0$

109. $\sec 4\theta-\sec 2\theta=2$ then value of θ equal to;

(a) $n\pi+\frac{\pi}{2}$ (b) $n\pi+\frac{\pi}{4}$
(c) $2n\pi\pm\frac{\pi}{2}$ (d) none of these

110. If x^3+3x^2-9x+c is of from $(x-\alpha)^2(x-\beta)$ then c =

(a) –5 (b) 27
(c) –27 (d) 0

111. Pointing to a man, a woman said that, "he is the son of the brother of my mother". How is that man related to woman;

(a) Brother (b) Cousin
(c) Uncle (d) None of these

112. Pointing to a man, Nilesh said that, "his wife is the daughter of my uncle". How is Nilesh related to that man;

(a) Father (b) Father-in-law
(c) Son-in-law (d) none of these

113. A drawn contains 5 brown socks and 4 blue socks well mixed. A man reaches the drawer and pulls out 2 shocks at random. What is the probability that they match ?

(a) 4/9 (b) 5/8
(c) 5/9 (d) 7/12

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114. The equation of the curve satisfying the differential equation $y_2(x^2 + 1) = 2ky_1$ passing through the point (0, 1) and having slope of tangent at x=0 as 3 is;

(a) $y = x^3 + 3x + 2$ (b) $y = x^3 - 3x - 2$

(c) $y = x^2 + 3x + 1$ (d) $y = x^2 + 3x - 1$

115. The area of the quadrilateral formed by the tangents at the end-points of latusracta to the ellipse $\frac{x^2}{9} + \frac{y^2}{5} = 1$ is;

(a) $\frac{27}{4}$ sq. units (b) 9 sq. units

(c) $\frac{27}{2}$ sq. units (d) 27 sq. units

116. A problem in Mathematics is given to four students A, B, C and D their respective probability of solving the problem are $\frac{1}{2}, \frac{2}{3}, \frac{3}{4}$ and $\frac{2}{7}$. Probability that the problem is solved is;

(a) $\frac{158}{168}$ (b) $\frac{5}{168}$

(c) $\frac{163}{168}$ (d) none of these

117. If O is the origin and O P, OQ are tangent to the circle $x^2 + y^2 + 2gx + 2fy + c=0$, the circumcentre of triangle OPQ is;

(a) (−g, −f) (b) (g, f)

(c) (−f, −g) (d) none of these

118. A man is known to speak truth 3 out of 4 times. He throws of die and report that it is 6. Then find the probability that it is actually a 6;

(a) 1/4 (b) 5/8

(c) 3/8 (d) 1/6

119. A watch which gains uniformly is 2 minutes low at noon on Monday and is 4 minutes 48 seconds fast at 3 p.m. on the following Monday. When was it correct ?

(a) 2 p.m. on Tuesday

(b) 2 p.m. on Wednesday

(c) 3 p.m. on Thursday

(d) 1 p.m. on Friday

120. It was Sunday on January 1, 2006. What was the day of the week on January 1, 2010 ?

(a) Sunday (b) Saturday

(c) Friday (d) Wednesday

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ANSWERS

01. a	02. b	03. a	04. b	05. a
06. a	07. a	08. c	09. d	10. a
11. d	12. b	13. b	14. d	15. b
16. c	17. d	18. d	19. c	20. a
21. c	22. c	23. c	24. c	25. c
26. c	27. d	28. c	29. c	30. c
31. c	32. b	33. b	34. a	35. a
300 d	37. b	38. a	39. b	40. a
41. c	42. a	43. d	44. a	45. a
46. c	47. a	48. a	49. a	50. d
51. a	52. c	53. a	54. a	55. d
56. c	57. a	58	59. a	60. c
61. b	62. c	63. c	64. b	65. b
66. a	67. b	68	69. d	70
71. a	72. c	73. b	74. a	75. b
76. b	77. c	78. d	79. d	80. a
81. a	82. a	83. c	84. d	85. b
86. c	87. a	88. b	89. d	90. c
91. c	92. d	93. c	94. a	95
96. a	97. d	98. a	99. a	100. d
101. a	102. a	103. a	104. c	105. a
106. a	107. a	108. c	109. c	110. c
111. b	112. b	113. a	114	115. d
116. c	117. d	118. c	119.b	120.c