

1. The matrix equation  $X^2 = I_2$ , where  $I_2$ , the identity matrix of order 2 and  $X$  is a square matrix of order 2 over the field of real numbers has :
- (A) No solutions (B) One solution  
(C) Two solutions (D) Infinitely many solutions
2. Let  $G = \left\{ \begin{bmatrix} a & -b \\ b & a \end{bmatrix} : a, b, \in \mathbb{R} \right\}$  and let  $+$  and  $\cdot$  denote the matrix addition and multiplication respectively. Then \_\_\_\_\_.
- (A)  $(G, +)$  is a group but  $(G, \cdot)$  is not a group.  
(B)  $(G, \cdot)$  is a group but  $(G, +)$  is not a group.  
(C)  $(G, \cdot)$  is isomorphic with  $(\mathbb{C}, \cdot)$  where  $\mathbb{C}$  is the group of complex numbers.  
(D) None of the above
3. Let  $D$  be the group of symmetries of the square. Then \_\_\_\_\_.
- (A)  $D$  has 4 subgroups of order 2 (B)  $D$  has 3 subgroups of order 4  
(C) Order of  $D$  is 16 (D) Order of  $D$  is 12
4. Which of the following sets is a subspace of the vector space  $\mathbb{R}^2$  ?
- (A)  $\{(x, y) \in \mathbb{R}^2 : x^2 + y^2 = 1\}$  (B)  $\{(x, y) \in \mathbb{R}^2 : xy = 1\}$   
(C)  $\{(x, y) \in \mathbb{R}^2 : y = x\}$  (D)  $\{(x, y) \in \mathbb{R}^2 : y = x^2\}$
5.  $G$  is a group of order 31. Then \_\_\_\_\_.
- (A)  $G$  is cyclic (B)  $G$  is non-cyclic  
(C)  $G$  is non-abelian (D) None of the above
6. Let  $T : \mathbb{R}^3 \rightarrow \mathbb{R}^3$  be the linear transformation defined by  $T(x, y, z) = (x, y, 0)$ . Then \_\_\_\_\_.
- (A)  $(0, 0, 4)$  is in the range space. (B)  $\left(2, \frac{1}{\sqrt{2}}, 0\right)$  is in the zero space.  
(C)  $(1, 1, 1)$  is in the range space. (D)  $(0, 0, 1)$  is in the zero space.
7. The geometrical effect of the linear transformation associated with the matrix  $\begin{bmatrix} -1 & 0 \\ 0 & 2 \end{bmatrix}$  is :
- (A) a rotation by an angle  $\frac{\pi}{2}$   
(B) stretching along Y-axis and a reflection with respect to Y-axis  
(C) a stretching along X-axis  
(D) a reflection with respect to X-axis

8. If  $T : V \rightarrow V$  is an orthogonal transformation on an inner product space  $V$  and if  
 (I) :  $T$  is an isometry  
 (II) :  $T$  takes orthonormal basis to orthonormal basis then \_\_\_\_\_.  
 (A) (I) is true but (II) is false (B) (I) is false but (II) is true  
 (C) Both (I) and (II) are true (D) Both (I) and (II) are false
9. Let  $*$  be the cross product in the Euclidean space  $\mathbb{R}^3$ . Then \_\_\_\_\_ .  
 (A)  $*$  is associative (B)  $*$  is commutative  
 (C)  $*$  is not associative (D) None of the above
10. Choose the linear mapping from the following :  
 (A)  $F : \mathbb{R}^2 \rightarrow \mathbb{R}^2$  defined by  $F(x, y) = (x^2, y^2)$   
 (B)  $F : \mathbb{R}^3 \rightarrow \mathbb{R}^2$  defined by  $F(x, y, z) = (x + 2y - 3z, 4x - 5y + 6z)$   
 (C)  $F : \mathbb{R}^3 \rightarrow \mathbb{R}^2$  defined by  $F(x, y, z) = (|x|, y + z)$   
 (D)  $F : \mathbb{R}^2 \rightarrow \mathbb{R}^2$  defined by  $F(x, y) = (xy, y)$
11. Domain of the function  $y = \sqrt{1 - x^2}$  is :  
 (A)  $\mathbb{R}$  (B)  $[0, 1]$  (C)  $[-1, 1]$  (D)  $(0, 1)$
12.  $\oint xy dy - y^2 dx$  is :  
 (A) 0 (B)  $\frac{3}{2}$  (C) 1 (D)  $\pi$
13. Laplace equation  $U_{xx} + U_{yy} = 0$  is :  
 (A) Elliptic (B) Parabolic (C) Hyperbolic (D) None of these
14. Number of different permutations of 'n' items taken 'k' at a time without repetition is :  
 (A)  $n!$  (B)  $\frac{n!}{k!}$  (C)  $\frac{n!}{(n - k)!}$  (D)  $2^n$
15. Every polynomial of degree  $\geq 1$  has \_\_\_\_\_ zero.  
 (A) exactly one (B) infinitely many (C) atleast one (D) none of these
16. Upper triangular matrices are :  
 (A) Matrices having non-zero entries above the main diagonal.  
 (B) Square matrices having non-zero entries above the main diagonal.  
 (C) Matrices having non-zero entries only on and above the main diagonal.  
 (D) Square matrices having non-zero entries only on and above the main diagonal.
17. The Wronskian of functions  $\sin x$  and  $\cos x$  is :  
 (A) -1 (B) 0 (C) 1 (D)  $\pi$
18. An operator  $T$  on a Hilbert space  $H$  is normal, then it's adjoint  $T^*$  is \_\_\_\_\_.  
 (A) a linear transformation (B) a polynomial in  $T$   
 (C) orthogonal (D) none of these

19. Unit tangent vector of the helix  $s(t) = \cos t \hat{i} + \sin t \hat{j} + t \hat{k}$  is :

- (A)  $\sin t$  (B)  $\frac{\sin t}{\sqrt{2}} \hat{i} + \frac{\cos t}{\sqrt{2}} \hat{j} + \frac{t \hat{k}}{\sqrt{2}}$   
 (C)  $\frac{\sin t}{\sqrt{2}} \hat{i} + \frac{\cos t}{\sqrt{2}} \hat{j} + \frac{1}{\sqrt{2}} \hat{k}$  (D) none of these

20.  $\int_0^{\pi/2} \log \tan x \, dx$  is :

- (A) 1 (B) e (C) 0 (D)  $\pi$

21. If  $x > 0$  and if  $y$  is an arbitrary real number, then there is a positive integer  $n$  such that  $nx > y$ . This property of real number is called :

- (A) Supremum property (B) Archimedean property  
 (C) Approximation property (D) Comparison property

22. Let  $A$  be the set of all sequences whose elements are the digits 0 and 1. Then the set  $A$  is :

- (A) Finite (B) Countable  
 (C) Uncountable (D) Having  $2^n$  elements

23. The  $\lim_{n \rightarrow \infty} ((2n)^{1/n})$  is :

- (A) 0 (B) 2 (C)  $2e$  (D) 1

24.  $\lim_{x \rightarrow 0} x \cos\left(\frac{1}{x}\right)$  is :

- (A) 0 (B) Does not exist (C) 1 (D)  $\infty$

25. The series  $\frac{1}{2} + \frac{1}{3} + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{2^3} + \frac{1}{3^3} + \dots$

- (A) Tends to  $\infty$  (B) Converges (C) Diverges (D) Oscillates

26. Which of the following functions is uniformly continuous ?

- (A)  $f(x) = \frac{1}{x}$  for  $x \in [1, \infty)$  (B)  $f(x) = \frac{1}{x}$ ,  $x \in (0, 1)$   
 (C)  $f(x) = x^2$ ,  $x \in \mathbb{R}$  (D)  $f(x) = \sin\left(\frac{1}{x}\right)$ ,  $x \in \mathbb{R}$  such that  $x > 0$

27. Let  $f$  be a function defined on  $[0, 1]$  by  
 $f(x) = 0$  when  $x$  is rational  
 $= 1$  when  $x$  is irrational  
 The Lebesgue integral of  $f$  over  $[0, 1]$  is :  
 (A) 0 (B) Does not exist (C)  $\infty$  (D) 1
28. Suppose  $f \geq 0$  and  $f$  is continuous on  $[a, b]$  and  $\int_a^b f(x) dx = 0$ . Which of the following is true ?  
 (A)  $f(x) = 0$  for all  $x \in [a, b]$   
 (B)  $f(x) = 1$  for all  $x \in [a, b]$   
 (C)  $f$  is monotonic increasing on  $[a, b]$   
 (D) Image of  $f$  is  $[0, \infty)$
29. Which of the following is true ?  
 (A) Every Lebesgue integrable function is Riemann integrable  
 (B) Every Riemann integrable function is Lebesgue integrable  
 (C) Limits of Riemann integrable functions are always Riemann integrable  
 (D) Limits of measurable functions need not be measurable
30. The measure of the cantor set is :  
 (A)  $\infty$  (B) 1 (C) 0 (D) not measurable
31. If  $\omega \neq 1$  is an  $n^{\text{th}}$  root of unity, then  $1 + 2\omega + 3\omega^2 + \dots + n\omega^{n-1} =$   
 (A) 0 (B)  $\frac{1}{(1-\omega)^2}$  (C)  $\frac{-n}{\omega-1}$  (D)  $\frac{n}{\omega-1}$
32. Which one of the following functions is not the real part of an analytic function ?  
 (A)  $u(x, y) = x^2 - y^2$  (B)  $u(x, y) = x^2 + y^2$   
 (C)  $u(x, y) = x^3 - 3xy^2 - y$  (D)  $u(x, y) = e^x \cos y$
33. Which one of the following is not true about  $f(z) = \sin z$  ?  
 (A) it is a bounded function (B) it is an entire function  
 (C) it is a periodic function (D) its zeroes are isolated
34. Choose the correct statement :  
 (A)  $f(z) = e^{1/z}$  has an essential singularity at  $z = \infty$   
 (B)  $f(z) = \frac{e^z - 1}{z}$  has a simple pole at  $z = 0$   
 (C)  $f(z) = z^2 + 1$  has a pole of order 2 at  $z = \infty$   
 (D)  $f(z) = \frac{1}{\sin \frac{1}{z}}$  has an isolated singularity at  $z = 0$

35. Let  $C$  be the circle  $|z|=1$ . Then,

$$\int_C e^{4/z} dz =$$

- (A)  $4\pi i$                       (B)  $-4\pi i$                       (C)  $-8\pi i$                       (D)  $8\pi i$

36. Consider the metric space  $(M, d)$ , where  $M=[0, 1]$  and  $d$  is the usual metric. Then the open ball  $B\left(0, \frac{1}{2}\right) =$

- (A)  $\left[0, \frac{1}{2}\right)$                       (B)  $\left(0, \frac{1}{2}\right)$                       (C)  $\left[0, \frac{1}{2}\right]$                       (D)  $\left[0, \frac{1}{2}\right]$

37. The topology on  $\mathbb{R}$  induced by the Euclidean metric is called :

- (A) discrete topology                      (B) indiscrete topology  
(C) usual topology                      (D) Sorgenfrey topology

38. Choose the correct statement :

- (A) Every connected space is path connected.  
(B) Local connectedness is a hereditary property.  
(C) Every path connected space is connected.  
(D) Local connectedness is preserved under continuous functions.

39. Which one of the following is not a divisible property ?

- (A) Being a discrete space                      (B) Being a locally connected space  
(C) Being a finite space                      (D) Being a regular space

40. Choose the incorrect statement :

- (A) Every second countable space is Lindeloff.  
(B) Every subspace of a normal space is normal.  
(C) Every metric space is normal.  
(D) Every compact subset in a Hausdorff space is closed.

41.  $\beta(m, n)$  is equal to :

- (A)  $\frac{\Gamma m + \Gamma n}{\Gamma(m+n)}$                       (B)  $\frac{\Gamma m - \Gamma n}{\Gamma(m-n)}$                       (C)  $\frac{\Gamma m \Gamma n}{\Gamma(m+n)}$                       (D)  $\frac{\Gamma(m+n)}{\Gamma m \Gamma n}$

42. According to Rodrigue's Formula :

- (A)  $P_n(x) = \frac{1}{2^n n!} \frac{d^n}{dx^n} (x^2+1)^n$                       (B)  $P_n(x) = \frac{1}{2^n n!} \frac{d^n}{dx^n} (x^2-1)^n$   
(C)  $P_n(x) = \frac{n}{2^n} \frac{d^n}{dx^n} (x^2+1)^{-n}$                       (D)  $P_n(x) = \frac{n-1}{2^n} \frac{d^n}{dx^n} (x^2-1)^{-n}$

43.  $L\left(\frac{1-\cos t}{t}\right)$  is :

(A)  $\frac{1}{2} \log \left\{ \frac{(s^2+1)}{s^2} \right\}$

(B)  $-\frac{1}{2} \log \left\{ \frac{(s^2+1)}{s^2} \right\}$

(C)  $\frac{1}{2} \log \left\{ \frac{s}{s^2+1} \right\}$

(D)  $-\frac{1}{2} \log \left\{ \frac{s}{s^2-1} \right\}$

44. The solution of  $(12x + 5y - 9)dx + (5x + 2y - 4)dy = 0$  is :

(A)  $6x^2 - 5xy - y^2 + 9x - 4y = c$

(B)  $3x^2 - 4xy + 9x - 3y = c$

(C)  $6x^2 + 5xy - y^2 - 9x - 4y = c$

(D)  $6x^2 + 5xy + y^2 - 9x - 4y = c$

45. In the Fourier series expansion for the function  $x^2$  in the interval  $[-\pi, \pi]$  the value of  $a_n$  is :

(A)  $\frac{2(-1)^n}{n}$

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

(C)  $\frac{4}{n^2}$

(D)  $\frac{2(-1)^n}{n^2}$

46. Solution of the Clairaut's equation  $p = \log(px - y)$  where  $p = \frac{dy}{dx}$  is :

(A)  $y = cx$

(B)  $c = \log(cx - y)$

(C)  $(y - cx)(c - 1) = 1$

(D)  $(y - 1)c = c - 1$

47. With usual notations  $F(a, b; c; y)$  is given by :

(A)  $1 - \sum_{n=1}^{\infty} \frac{(a)_n (b)_n y^n}{(c)_n n!}$

(B)  $\sum_{n=1}^{\infty} \frac{(a)_n (b)_n y^n}{(c)_n n!} - 1$

(C)  $1 - \sum_{n=0}^{\infty} \frac{(a)_n (c)_n y^n}{(b)_n n!}$

(D)  $1 + \sum_{n=1}^{\infty} \frac{(a)_n (b)_n y^n}{(c)_n n!}$

48. The equation  $(1 - x^2)y'' - 2xy' + n(n + 1)y = 0$  is called \_\_\_\_\_.

(A) Bessel equation

(B) Legendre equation

(C) Chebyshev's equation

(D) Laguerre equation

49. In the 4<sup>th</sup> order Runge-Kutta method the global error will be :

(A)  $O(h^2)$

(B)  $O(h^3)$

(C)  $O(h^4)$

(D)  $O(h^6)$

50. Using Picard's method the approximate solution to the initial value problem  $y' = 1 + y^2$ ,  $y(0) = 0$  is :

(A)  $y(x) = \tan x$

(B)  $y(x) = x - \frac{1}{3}x^3 - \frac{2}{15}x^5 + \dots$

(C)  $y(x) = x + \frac{1}{3}x^2 + \frac{2}{15}x^4 + \dots$

(D)  $y(x) = x + \frac{2}{3}x^3 + \frac{1}{15}x^5 + \dots$

51. The partial differential equation formed from the equation that represents the set of all spheres whose centre lie along the z-axis is given by :

(A)  $xp - yq = 0$       (B)  $yp - zq = 0$       (C)  $yp - xq = 0$       (D)  $xp - zq = 0$

52. The complete integral of the equation  $(p^2 + q^2)x = pz$  is :

(A)  $z^2 = a^2x + (ay + b)^2$       (B)  $z = a^2x^2 + (ay + b)^2$

(C)  $z^2 = a^2x^2 + (ay + b)$       (D)  $z^2 = a^2x^2 + (ay + b)^2$

53. The integral surface of the equation

$(2xy - 1)p + (z - 2x^2)q = 2(x - yz)$ , which passes through the line  $x_0(s) = 1$ ,  $y_0(s) = 0$  and  $z_0(s) = s$  is :

(A)  $x^2 + y^2 + z^2 - xz - y + z = 1$       (B)  $x^2 + y^2 - xyz - y + z = 1$

(C)  $x^2 + y^2 - xz - y + z = 1$       (D)  $x^2 + y^2 - xz - yz + z = 1$

54. Which of the following are solutions to the partial differential equation :  $\frac{\partial^2 u}{\partial x^2} = 9 \frac{\partial^2 u}{\partial y^2}$

(A)  $\cos(3x - y)$       (B)  $x^2 + y^2$       (C)  $\sin(3x - 3y)$       (D)  $e^{-3\pi x} \sin \pi y$

55. The partial differential equation  $5 \frac{\partial^2 z}{\partial x^2} + 6 \frac{\partial^2 z}{\partial y^2} = xy$  is classified as :

(A) elliptic      (B) parabolic      (C) hyperbolic      (D) none of the above

56. The finite difference approximation of  $\frac{\partial^2 u}{\partial x^2}$  in the elliptic equation  $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} = 0$  at  $(x, y)$  can be approximated as :

(A)  $\frac{\partial^2 u}{\partial x^2} \equiv \frac{u(x + \Delta x, y) - 2u(x, y) + u(x - \Delta x, y)}{(\Delta x)^2}$

(B)  $\frac{\partial^2 u}{\partial x^2} \equiv \frac{u(x + \Delta x, y) - u(x, y) + u(x - \Delta x, y)}{(\Delta x)^2}$

(C)  $\frac{\partial^2 u}{\partial x^2} \equiv \frac{u(x, y + \Delta y) - 2u(x, y) + u(x, y - \Delta y)}{(\Delta x)^2}$

(D)  $\frac{\partial^2 u}{\partial x^2} \equiv \frac{u(x + \Delta x, y) - u(x - \Delta x, y)}{2\Delta x}$

57. Which of the following is an example of a parabolic type partial differential equation ?

- (A) Wave equation (B) Heat equation  
(C) Laplace's equation (D) None of the above

58. The following function(s) can be used for interpolation :

- (A) Polynomial (B) Exponential  
(C) Trigonometric (D) All of the above

59. Given,  $\frac{d^2 y}{dx^2} = 6x - 0.5x^2$ ,  $y(0) = 0$ ,  $y(12) = 0$  the value of  $\frac{d^2 y}{dx^2}$  at  $y(4)$  using the finite difference method and a step size of  $h = 4$  can be approximated by :

(A)  $\frac{y(8) - y(0)}{8}$  (B)  $\frac{y(8) - 2y(4) + y(0)}{16}$

(C)  $\frac{y(12) - 2y(8) + y(4)}{16}$  (D)  $\frac{y(4) - y(0)}{4}$

60. The following  $x - y$  data is given :

$x$	15	18	22
$y$	24	37	25

The Newton's divided difference second order polynomial for the above data is given by :  
 $f_2(x) = b_0 + b_1(x - 15) + b_2(x - 15)(x - 18)$

The value of  $b_1$  is most nearly :

- (A) -1.0480 (B) 0.14333 (C) 4.3333 (D) 24.000

61. Where is the minimum criterion used ?  
 (A) When there is an AND operation (B) When there is an OR operation  
 (C) In De Morgan's theorem (D) None of the above
62. Which of the following statements is true ?  
 (A) A number is rational if and only if its square is rational.  
 (B) An integer  $n$  is odd if and only if  $n^2 + 2n$  is odd.  
 (C) A number is irrational if and only if its square is irrational.  
 (D) A number  $n$  is odd if and only if  $n(n + 1)$  is even.
63. Consider the following language  $L = \{a^n b^n c^n d^n | n \geq 1\}$   $L$  is :  
 (A) CFL but not regular (B) CSL but not CFL  
 (C) regular (D) type 0 language but not type 1
64. Which of the following is a level set of  $f(x_1, x_2) = x_1 - x_2$   
 (A)  $\{(x_1, x_2) | x_1 - 2 = x_2 + 1\}$  (B)  $\{(x_1, x_2) | x_1^2 = x_2\}$   
 (C)  $\{(x_1, x_2) | x_1 - 2 = 0\}$  (D)  $\{(x_1, x_2) | x_1^2 = x_2^2\}$
65. Which of the following is false ?  
 (A) Product of  $T_1$  - spaces is a  $T_1$  - space  
 (B) Product of completely regular spaces is completely regular  
 (C) Product of first countable spaces is first countable  
 (D) Product of two second countable spaces is second countable
66. What's the highest dimension a fractal can have ?  
 (A) 1 (B) 2 (C) 3 (D) 4
67. The Lorentz Butterfly is an example of what type of fractal ?  
 (A) Julia set (B) Mandelbrot set  
 (C) Strange Attractor (D) None of the above
68. What integral equation is equivalent to the initial value problem  $y' = t^2 - y$ ,  $y(-1) = 2$ .  
 (A)  $y(t) = -1 + \int_2^t (s^2 - y(s)) ds$  (B)  $y(t) = 2 + \int_{-1}^t (s^2 - y(s)) ds$   
 (C)  $y(t) = 2 + \int_{-1}^t s y(s) ds$  (D) None of the above
69. Who were the two mathematicians that invented calculus ?  
 (A) Newton and Laplace (B) Newton and Euler  
 (C) Newton and Gauss (D) Newton and Leibniz
70. For the differential equation  $4x^3 y'' + 6x^2 y' + y = 0$  the point at infinity is :  
 (A) an ordinary point (B) a critical point  
 (C) an irregular singular point (D) a regular singular point

71. A good scientific research is characterized by :
- (A) It requires clear articulation of a goal  
 (B) It follows specific plan and procedure  
 (C) It accepts certain critical assumptions  
 (D) All the above
72. To understand human behavior and reasons over a long period of time one has to do :
- (A) Historical study (B) Quasi experimental study  
 (C) Longitudinal study (D) Cross sectional study
73. Teaching and learning arrangements, usually in small groups, that are structured to produce active participation in learning is :
- (A) Symposium (B) Seminar (C) Conference (D) Workshop
74. Directly useful application of scientific principles to production is called :
- (A) Knowledge (B) Science (C) Technology (D) Research
75. Which of the following qualities a researcher must have ?
- (A) Curious about the world (B) Logical and systematic  
 (C) Intellectually honest (D) All the above
76. The most effective teaching method that ensures maximum participation of students is :
- (A) Lecture method (B) Text book method  
 (C) Discussion method (D) Demonstration method
77. Which of the following is the most important indicator of quality of education in a school ?
- (A) Infrastructural facilities  
 (B) Qualification of teachers  
 (C) Discipline maintained in the school  
 (D) Students' achievements
78. Which of the following is not a quality of effective teacher ?
- (A) Less interaction in the class  
 (B) Adopt interactive method of teaching  
 (C) Reduce the anxiety level of students  
 (D) Motivate the students to take initiative
79. Which of the following can be achieved through value education ?
- (A) To inculcate of virtues (B) Develop job skills  
 (C) Aware on physical fitness (D) Development of personality
80. Teaching method where purposeful activity that will remove a recognized difficulty or perplexity in situation through the process of reasoning is :
- (A) Inquiry method (B) Problem solving method  
 (C) Reflective method (D) None of the above

81. \_\_\_\_\_ of The Constitution of India directs the State to organize village panchayats and endow them with powers and authority to function as units of self-governments.  
 (A) Article 39 (B) Article 40 (C) Article 42 (D) Article 46
82. Article \_\_\_\_\_ of The Constitution of India imposes a duty upon citizens to uphold and protect the sovereignty, unity and integrity of India.  
 (A) 51-A(b) (B) 51-A(j) (C) 51-A(c) (D) 51-A(f)
83. All-India services can be created by The Parliament as empowered under \_\_\_\_\_ of The Constitution of India.  
 (A) Article 312 (B) Article 312-A (C) Article 313 (D) Article 310
84. Freedom as to payment of taxes for promotion of any particular religion is guaranteed under Article \_\_\_\_\_ of The Constitution of India.  
 (A) 26 (B) 27 (C) 28 (D) 29
85. In *Sodan Singh v New Delhi Municipality* AIR 1989 SC 1988, The Supreme Court was called upon to decide whether \_\_\_\_\_.  
 (A) Municipal authorities can impose restrictions on slaughter houses under Article 19(6)  
 (B) Employees had a fundamental right to resort to strike without notice  
 (C) Local authorities can levy a tax retrospectively  
 (D) Hawkers had a fundamental right to carry on their trade on pavements meant for pedestrians
86. First appeal under Section 19(1) of The Right to Information Act 2005 has to be preferred within \_\_\_\_\_ days from the expiry of period for receipt of information or from date of decision.  
 (A) fifteen (B) thirty (C) forty-five (D) sixty
87. As per Section 4(1)(c) of The National Green Tribunal Act 2010, The Tribunal shall consist of a minimum of \_\_\_\_\_ full-time expert members.  
 (A) five (B) twenty (C) fifteen (D) ten
88. As per Section 22(1)(b) of The Transplantation of Human Organs Act 1994, no court shall take cognizance of an offence except on complaint filed by a person who has given notice of not less than \_\_\_\_\_ days to the Appropriate Authority, of the alleged offence and his intention to make the complaint.  
 (A) thirty (B) sixty (C) ninety (D) fifteen
89. As per Section 10(1) of The Scheduled Castes and Scheduled Tribes (Prevention of Atrocities) Act 1989, a special court can pass an externment order against a person likely to commit offence, and direct him not to return to the concerned area for such period not exceeding \_\_\_\_\_ as may be specified in the order.  
 (A) six months (B) one year (C) two years (D) five years

90. According to Rule 2(j) of The Noise Pollution (Regulation and control) Rules 2000, 'Night Time' has been defined as the period between \_\_\_\_\_.
- (A) 10 pm and 6 am (B) 10 pm and 5 am  
(C) 10 pm and 7 am (D) 9.30 pm and 6.30 am
91. Who was the founder of 'Sadhu Jana Paripalana Sangham' ?
- (A) Sree Narayana Guru (B) Ayyankali  
(C) Chattampi Swamikal (D) Sahodaran Ayyappan
92. The social organisation in Kerala, 'Samathwa Samajam' was established in the year :
- (A) 1836 (B) 1851 (C) 1855 (D) 1898
93. Which among the following is not written by G. Sankara Kurup ?
- (A) Suryakanthi (B) Nimisham  
(C) Viswa Darsanam (D) Kunnimanikal
94. Author of the famous book 'Jaathikkummi' :
- (A) K.P. Karuppan (B) T.R. Krishnaswami Iyer  
(C) P.K. Chattan Master (D) K.P. Vellon
95. The Renaissance leader in Kerala, who got the name 'Kumara Guru' :
- (A) Mampuram Thangal (B) Pampadi John Joseph  
(C) Poikayil Yohannan (D) Moorkoth Kumaran
96. The name given to the Airforce's rescue operation provided to the flood victims of Uttarakhand :
- (A) Operation Surya Hope (B) Operation Rahat  
(C) Operation Ganga Prahar (D) Operation Blossom Spring
97. Which year has formally declared by UN General Assembly as 'International year of family farming' ?
- (A) 2014 (B) 2010 (C) 2006 (D) 2009
98. The commission appointed for studying the contributory pension system in Kerala :
- (A) Ranga Rajan Commission (B) Hazari Commission  
(C) Sree Krishna Commission (D) Bhattacharya Commission
99. Which Constitutional Amendment incorporated Panchayati Raj System in our constitution ?
- (A) 43<sup>rd</sup> Amendment (B) 74<sup>th</sup> Amendment  
(C) 73<sup>rd</sup> Amendment (D) 44<sup>th</sup> Amendment
100. The nodal agency for estimation of poverty at the national and state level in India :
- (A) Rural Ministry (B) Planning Commission  
(C) Finance Commission (D) Home Ministry

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