# SRI SAI COACHING CENTRE
## 2/25, Raja Mill Road, Madurai-1
## TRB – P.G. – MATHS – 2018 – Model - I

Name: ………………

Roll: ………………...                                                                                  **30.09.18**

1.   The square root of $8 - 15i$ is ……………..

   A) $\frac{1}{\sqrt{2}}(5 - 3i)$       B) $\frac{1}{\sqrt{2}}(-5 - 3i)$       C) $\pm\frac{1}{\sqrt{2}}(-5 - 3i)$          D) $\pm\frac{1}{\sqrt{2}}(5 - 3i)$

2.   Which one is incorrect?

   A) $arc\ cos\ w = \pm i\ log\left(w \pm \sqrt{w^2 - 1}\right)$       B) $arc\ cos\ z = i\ log\left(z + \sqrt{z^2 - 1}\right)$

   C) $D\ arc\ cos\ z = \frac{1}{\sqrt{1 - z^2}}$                                       D) $D\ (cos z) = sin\ z$

3.   Which one is incorrect?

   A) A mapping by the conjugate of an analytic function with a non-vanishing derivative is indirectly conformal

   B) Indirectly conformal preserves both the size and the sense of angles

   C) If the mapping of $\Omega$ by $w = f(z)$ is Analytic, then the inverse function $z = f^{-1}(w)$ is analytic

   D) None of these

4.   Match the following:

| a | Circles of Apollonius with limit points a and b | 1. An orientation of C |
|---|---|---|
| b | Denote by $C_1$ the circles through a and b by $C_2$ the circles of Apollonius with these limit points. Then the circles $C_1$ and $C_2$ will be referred to as | 2. $\left|\frac{z-a}{z-b}\right| = \rho/|k|$, where $|\omega| = \rho$, concentric circles about origin |
| c | The lines $u = $ constant and $V = $ constant corresponds to two families of mutually tangent circles which intersect at right angles | 3. Circular net (or) Steiner circles determined by a and b |
| d | An ordered triple of points $z_1$, $z_2$, $z_3$ on circle C determines the | 4. Degenerate set of Steiner circles |

   **Codes:**      **a**      **b**      **c**      **d**                          **a**      **b**      **c**      **d**

   A)      2      3      4      1                    B)      2      4      3      1

   C)      3      2      4      1                    D)      4      3      2      1

5.   The fixed points of the linear transformation $\omega = \frac{2z}{3z - 1}$

   A) $z = 0, 1$       B) $z = \frac{1}{3}$       C) $z = 1$       D) None of these

6.   Let $P(x) = x^5 + 5x^4 + 10x^3 + 10x^2 - x - 2$ is irreducible over Q and have exactly two non real roots then the splitting field of P(x) over Q has of degree

A) 25            B) 125            C) 120     D) 121

7. If 1 is the characteristic root of $A = (\alpha_{ij})$ [$ie\ 1 - A\ is\ not\ invertible$] then

    i. For every j, $\Sigma_i\ \alpha_{ij} = 1$            ii. For every i, $\Sigma_i\ \alpha_{ij} = 1$

    iii. For every j, $\Sigma_j\ \alpha_{ij} = 1$           iv. For each i, $\Sigma_j\ \alpha_{ij} = 1$

    A) i, ii            B) ii, iii            C) iii, iv            D) i, iv

8. Find the inverse of $3 - \sqrt{2} \in Q\sqrt{2}$

    A) $\frac{3}{7} + \frac{1}{7}\sqrt{2}$            B) $3 + \sqrt{2}$            C) $\frac{3}{7} - \frac{\sqrt{2}}{7}$            D) $\sqrt{2} - 3$

9. The necessary and sufficient conditions on a and b so that the splitting field of irreducible polynomial $x^3 + ax + b$ has degree 3 over Q

    A) $-4a^3 - 27b^2 \in Q$            B) $4a^3 + 27b^2 \in Q$

    C) $\sqrt{-4a^3 - 27b^2} \in Q$           D) $\sqrt{4a^3 + 27b^2} \in Q$

10. Let F be a field and Let F $(x_1, x_2, \ldots \ldots x_n)$ be the field of rational functions in $x_1, \ldots x_n$ over F suppose that S is the field of symmetric rational Functions then

    i. $[F(x_1, \ldots \ldots x_n) : S] = n!$

    ii. $(F(x_1, \ldots \ldots x_n) : S) = S_n$, the symmetric group of degree n

    A) i is true      B) ii is not true      C) i and ii are not true      D) i and ii are true

11. Median of following frequency distribution is

| x | : | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| f | : | 8 | 10 | 11 | 16 | 20 | 25 | 15 | 9 | 6 |

    A) 60            B) 65            C) 4            D) 5

12. Choose the wrong

    A) Median is not at all affected by extreme values

    B) Median can be calculated for distribution with open – end classes

    C) Mean could not be calculated for distribution with open-end classes

    D) Harmonic Mean is easily understood and is not difficult to compute

13. Choose the wrong one

    A) For any Discreate distribution, standard deviation is not less than mean deviation from mean

    B) Mean deviation from mean is $\frac{n(n+1)\,d}{2n+1}$ and SD is $\sqrt{\frac{n(n+1)}{3}} \times d$ of A.P. a, a+d,

    …….., a + 2nd

    C) In (B) the latter is greater than the former

    D) Mean is a + (n – 1) d of A.P. a, a+d, ……. a + 2nd.

14. Choose the wrong one

A) In a deviations are small compared with mean M so that $\left(x/M\right)^3$ and higher powers of $\left(x/M\right)$ are neglected, we have (G – GM, H – HM, σ - S.D. M – AM)

i. $G = M\left(1 - \frac{1}{2}\frac{\sigma^2}{M^2}\right)$  ii. $M^2 - G^2 = \sigma^2$  and  iii. $H = M\left(1 - \frac{\sigma^2}{M^2}\right)$

B) Coefficient of Dispersion (based of SD) $= \dfrac{\sigma}{\overline{x}}$

C) Coefficient of Variation $= \dfrac{\sigma}{\overline{x}} \times 100$

D) Coefficient of Dispersion (based on Q.D) $= \dfrac{Q_3 + Q_1}{Q_3 - Q_1}$

15. 

| Given | Firm A | Firm B |
|---|---|---|
| Number of workers | 500 | 600 |
| Average of daily wage | 186 | 175 |
| Variance of distribution | 81 | 100 |

Which one is more variable

A) Firm A          B) Firm B     C) both A and B          D) Neither A nor B

16. Bessel's equation of order zero is

A) $x^2 y'' + xy' + (x^2 - n^2) y = 0$          B) $x y'' + y' + x y = 0$

C) $x^2 y'' + xy' + x y = 0$          D) None

17. In terms of Legendre polynomials $2 - 3x + 4x^2$ is

A) $\frac{1}{3}(10 - 9P_1 + 8P_2)$          B) $\frac{10}{3} + 3P_1 + \frac{8}{3}P_2$

C) $\frac{10}{3}P_0 + 3P_1 + \frac{8}{3}P_2$          D) $\frac{10}{3} - 3P_1 - \frac{8}{3}P_2$

18. Find the P.I. of $(D^2 + 1)y = \sin x \sin 2x$

A) $\frac{x\cos x}{4} - \frac{\cos 3x}{16}$          B) $\frac{\cos x}{4} + \frac{\cos 3x}{16}$

C) $\frac{x\cos x}{4} + \frac{\cos 3x}{16}$          D) $\frac{\cos x}{4} + \frac{x\cos 3x}{16}$

19. Solve $(1 + xy)y\,dx + (1 - xy)x\,dy = 0$

A) $\frac{1}{2x^2 y^2} = C$          B) $\log x - xy = C$

C) $\log\frac{x}{y} + \frac{1}{xy} = C$          D) $\log\frac{x}{y} - \frac{1}{xy} = C$

20. Solve $(x\tan{}^y/_x - y\sec^2{}^y/_x)dx + x\sec^2{}^y/_x\,dy = 0$

A) $x\tan{}^y/_x = C$          B) $\log\tan({}^y/_x) = C$

C) $y\sec^2{}^y/_x = C$          D) None

21. Let f be the function defined on R by $f(x) = |x - 1| + |x + 1|, \forall x \in R$. Then,

A) f is derivable at x = 1 and x = -1          B) f is not derivable at x = 1 and x = -1

C) f is derivable at x = 1 and not derivable at x = -1

D) f is continuous and differentiable at x = 1 and x = -1

22. An example of a function on the real line R ie., continuous but not uniformly continuous is

A) Constant function      B) Identity function      C) sin x      D) $x^2$

23. Which one is incorrect?

A) $U\ (P_1, f) \geq L\ (P_2, f)$          B) $L\ (P^*,\ f) \geq\ L\ (P, f)$

C) $L\ (P, f + g) \geq L\ (P, f) +\ L\ (P, g)$      D) $U\ (P, f + g) \geq U\ (P, f) +\ U(P, g)$

24. Given collection C of even intervals of the form $\left(-\frac{1}{n},\ \frac{1}{n}\right)$, then

A) C is a covering of (-1, 2)          B) C is not a covering of (-1, 2)

C) Union of intervals is (-1, 1)          D) Both (B) and (C)

25. If C(x) = (0, x(1), x(2), ………..) is a bounded operator then C(x) is a

A) Self Adjoint      B) normal      C) Unitary      D) Not normal

26. The elementary symmetric functions in $x_1$ , $x_2$ , $x_3$ is $a_1\ =\ x_1 + x_2 + x_3$ , $a_2\ =\ x_1 x_2 + x_2 x_3 + x_1 x_3$ , $a_3\ =\ x_1 x_2 x_3$ then $x_1$ , $x_2$ and $x_3$ are root of ……………..

A) $t^3 -\ a_1 t^2 +\ a_2 t - a_3$          B) $t^3 -\ a_1 t^2 - a_2 t - a_3$

C) $t^3 +\ a_1 t^2 +\ a_2 t + a_3$          D) $t^3 -\ a_1 t^2 - a_2 t + a_3$

27. Let $J(\sqrt{2})$ be the ring of real numbers of the form $+n\sqrt{2}$ , where $m, n$ are integers, with the usual addition and multiplication. Then the kernel of the homomorphism $\phi: J(\sqrt{2}) \to J(\sqrt{2})$ defined by $\emptyset(m + n\sqrt{2}) = m - n\sqrt{2}$ is

A) $J(\sqrt{2})$      B) empty      C) 0      D) $\sqrt{2}$

28. Let 'a' be an element of order 12 in a group G. what is the order of $a^9$?

A) 4      B) 3      C) 2      D) 1

29. The minimal polynomial of $(5 + 3\sqrt{2})$ over the field of rational numbers Q is :

A) $x^2 + 10x + 7$          B) $x^2 - 10x + 7$

C) $x^2 - 10x - 7$          D) $x^2 + 10x - 7$

30. If A is $m \times n$ and B is $n \times p$ matrices with ranks $r_A$ and $r_B$ respectively and rank of (AB) = $r$ , then which one of the following is always true?

A) $r = \min\{r_A, r_B\}$          B) $r = \max\{r_A, r_B\}$

C) $r \leq \min\{r_A, r_B\}$          D) $r \geq max\{r_A, r_B\}$

31. For a distribution, the mean is 10, variance is 16 $\gamma_1$ is +1 and $\beta_2\ =\ 4$

Which one is wrong based on above data about origin

A) $\mu'_1 = 10$      B) $\mu_2\ =\ 16$      C) $\mu_3\ =\ 256$      D) $\mu_4\ =\ 1024$

32. A, B and C are three mutually exclusive and exhaustive events associated with random experiment. The value of P(A) if $P(B) = \frac{3}{2}$ P(A) and $P(C) = \frac{1}{2}$ P(B) is

A) $\frac{9}{13}$      B) $\frac{4}{13}$      C) $\frac{13}{4}$      D) $\frac{13}{9}$

33. A speaks truth 4 out of 5 times. A die is tossed. He reports that there is a six. What is the chance that actually there was six?

A) $\frac{4}{9}$          B) $\frac{4}{30}$          C) $\frac{9}{30}$          D) *None of these*

34. Let X be a continuous random variable with p.d.f. given by

$$f(x) = \begin{cases} kx & 0 < x < 1 \\ k & 1 \le x < 2 \\ -kx + 3k & 2 \le x < 3 \\ 0 & otherwise \end{cases}$$

The value of k is

A) $2/3$          B) $3/5$          C) $1/2$          D) Cannot find

35. If the joint distribution function of X and Y is given

$$F_{XY}(x,y) = \begin{cases} 1 - e^{-x} - e^{-y} + e^{-(x+y)} & x > 0, \quad y > 0 \\ 0 & elsewhere \end{cases}$$

Choose the correct answer:

A) $f(x,y) = \begin{cases} e^{-(x+y)} & , \quad x \ge 0, \quad y \ge 0 \\ 0 & elsewhere \end{cases}$      B) $\begin{cases} f_X(x) = e^{-x} ; & x \ge 0 \\ f_Y(y) = e^{-y} ; & y \ge 0 \end{cases}$

C) X and Y are independent          D) All of these

36. Solve $2xz - px^2 - 2qxy + pq = 0$

A) $z = ay + b\,(x^2 - a)$          B) $z = ax + by + x^2$

C) $z = ay + bx + x^2$          D) None

37. Form the PDE from $f\,(x^2 + y^2 \, , \, z - xy) = 0$

A) $xp + yq = x^2 - y^2$          B) $xp - yq = x^2 + y^2$

C) $xp - yq = x^2 - y^2$          D) $xq + yp = x^2 - y^2$

38. $J_0^2 + 2J_1^2 + 2J_2^2 + 2J_3^2 + \ldots\ldots\ldots = ?$

A) cosx      B) sin x      C) 1      D) 0

39. Find the singular solution of p = log (px − y)

A) $y = cx - e^c$    B) $y = x(\log x - 1)$    C) $y = cx + e^c$    D) $cx - y = \log c$

40. Solve $z(x - y) = x^2 p - y^2 q$

A) $\phi\left(\frac{1}{x} + \frac{1}{y} , \frac{z}{x+y}\right) = 0$      B) $\phi\left(\frac{1}{x} - \frac{1}{y} , \frac{z}{x+y}\right) = 0$

C) $\phi\left(\frac{1}{x} + \frac{1}{y} , \frac{x-y}{+z}\right) = 0$      D) $\phi\left(\frac{1}{x} - \frac{1}{y} , \frac{x+y}{z}\right) = 0$

41. Let A ∈ BL (H). For all x, y ∈ H, then A is unitary iff

A) $(A\,(x), y) = (x, A(y))$          B) $(A(x), A(y)) = (A^*(x), A^*(y))$

C) $(A(x), A(y)) = (x, y) = (A^*(x), A^*(y))$      D) None of these

42. Let X be a non-zero Banach space over C and A ∈ BL(X). Then consider the statements

I. Gelfand – Magur theorem: σ(A) is non-empty

II. Gelfand - spectral Radius formula:

$$r_\sigma(A) = \inf_{n = 1, 2, \ldots} \|A^n\|^{1/n} = \lim_{n \to \infty} \|A^n\|^{1/n}$$

Of these

A) I true, II false                  B) I false, II true

C) I and II are true                  D) I and II are false

43. Which one is incorrect?

     A) For $1 \leq P \leq \infty$ , $l_P$ is separable

     B) For $1 \leq P \leq \infty$ , the metric space $l^P$ is complete

     C) For $1 < P < \infty$ , $l_P$ is reflexive

     D) None of these

44. Let A be a self – Adjoint operator on a finite dimensional Hilbert space H. Then every root of the characteristic polynomial of A is …………..

     A) real             B) imaginary       C) Both (A) and (B)       D) None of these

45. Which one is incorrect?

     A) The Union of a collection of connected subspaces of a topological space x, that have a point in common is connected

     B) Let A be a connected subspace of a topological space x. If $A \subseteq B \subseteq \overline{A}$ , then B is not connected

     C) The image of a connected space under a continuous map is connected

     D) A finite Cartesian product space is connected

46. If H is a subgroup of G under '+' iff

     A) $ab \in H, \forall a, b \in H$                B) $ab^{-1} \in H, \forall a, b \in H$

     C) $a - b \in H, \forall a, b \in H$           D) $a + b \in H, \forall a, b \in H$

47. If H is a subgroup of G and N is normal subgroup of G then $H \cap N$ is

     A) empty                                  B) not a subgroup

     C) subgroup of G but not normal subgroup         D) Normal subgroup of G

48. The Gaussian curvature and total curvature at a every point of a sphere of radius a is ………………

     A) $a^2 , 4\pi$          B) $\frac{1}{a^2} , 4\pi$          C) $4\pi, a^2$          D) $4\pi, \frac{1}{a^2}$

49. If $K_0$ is the Gaussian curvature at the orgin of a geodesic polar coordinate system then

     A) $g(u, 0) \sim \frac{u - K_0 u^3}{6} \ as \ u \to 0$          B) $g(u, 0) = \frac{u - K_0 u^3}{6} \ as \ u \to 0$

     C) $g(u, 0) \sim \frac{u + K_0 u^3}{6} \ as \ u \to 0$          D) $g(u, 0) = \frac{u + K_0 u^3}{6} \ as \ u \to 0$

50. The Bonnet's formula for the geodesic curvature of the curve $\phi(u, v)$ = constant is

     A) $HKg = \frac{\partial}{\partial u} \left( \frac{F\phi_2 - G\phi_1}{\theta} \right) + \frac{\partial}{\partial v} \left( \frac{F\phi_1 + E\phi_2}{\theta} \right)$

     B) $HKg = \frac{\partial}{\partial v} \left( \frac{F\phi_2 - G\phi_1}{\theta} \right) - \frac{\partial}{\partial v} \left( \frac{F\phi_1 - E\phi_2}{\theta} \right)$

     C) $HKg = \frac{\partial}{\partial u} \left( \frac{F\phi_2 - G\phi_1}{\theta} \right) + \frac{\partial}{\partial v} \left( \frac{F\phi_1 - E\phi_2}{\theta} \right)$

     D) $HKg = \frac{\partial}{\partial u} \left( \frac{F\phi_2 + G\phi_1}{\theta} \right) - \frac{\partial}{\partial v} \left( \frac{F\phi_1 + E\phi_2}{\theta} \right)$

51. If $Y = 5 + 2.8\,X$ and $X = 3 - 0.5\,Y$ are the estimated regression equation of Y on X and X on Y respectively.

Then (I) $b_{yx} = 2.8$

    (II) $b_{xy} = 0.5$

    A) Both I & II are true           B) I is true but not II

    C) II is true but not I           D) given data are incorrect

52. A Poisson distribution has a double mode at $x = 1$ and $x = 2$. Then probability that x will have one or the other of these two values is

    A) 2           B) $2e^{-2}$           C) $4e^{-2}$           D) $2e^{+4}$

53. Two independent random variates X and Y are both normally distributed with means 1 and 2 and standard deviations 3 and 4 respectively. Then mean and standard deviation of $Z = X - Y$ are

    A) 3, 7           B) -1, 1           C) (-1, 25)           D) (-1, 5)

54. If X is uniformly distributed with mean 1 and variance $\frac{4}{3}$. Then $P\,(X < 0)$

    A) $\frac{1}{4}$           B) $\frac{1}{2}$           C) -1 and 3           D) None of these

55. Choose the wrong one

A) The mean value of positive square root of a $\gamma\,(\mu)$ variate is $\dfrac{\Gamma(\mu+^1/_2)}{\Gamma(\mu)}$

B) If X and Y are independent Gamma variate with parameters $\mu\ and\ v$ respectively, then variables $u = X + Y,\ Z = \dfrac{X}{X+Y}$ are independent and that U is a $\gamma\,(u + v)$ variate and $z$ is a $\beta_1(u, v)$ variate

C) If X and Y are independent Gamma variates with parameters $\mu$ and $v$ respectively. Then $U = X + Y,\ Z = \dfrac{X}{Y}$ are independent and that U is a $\gamma\,(u + v)$ variate and $z$ is a $\beta_1(u, v)$ variate

D) A random variable X is said to have a binomial distribution if the P.D.F is
$$f_x(x) = \frac{1}{\pi\,(1 + x^2)} - \infty < x < \infty$$

56. Let $a_n = \begin{cases} \dfrac{1+n}{n} & if\ \ n\ is\ even \\ \dfrac{1-n}{n} & if\ \ n\ is\ odd \end{cases}$

then,

A) $lim\ sup\ a_n = lim\ inf\ a_n = 1$

B) $lim\ sup\ a_n = lim\ inf\ a_n = -1$

C) $lim\ sup\ a_n = 1\ and\ lim\ inf\ a_n = -1$

D) $lim\ sup\ a_n = -1\ and\ lim\ inf\ a_n = 1$

57. Let S be a compact subset of a metric space M, then

A) S is open and bounded     B) S is closed and bounded

C) S is open and unbounded    D) S is closed and unbounded

58. A sub set of a countable set is

A) Uncountable set     B) Countable set

C) Need not be countable    D) Bounded set

59. The function $f(x) = \begin{cases} x \sin \frac{1}{x}, & x \neq 0 \\ 0, & x = 0, \end{cases}$ is

A) Differentiable at $x = 0$

B) Discontinuous at $x = 0$

C) Twice differentiable at $x = 0$

D) Continuous at $x = 0$ but not differentiable at $x = 0$

60. For the function $f(z) = \frac{\sin z^2}{z}$, $z = 0$ is

A) Removable singularity     B) Simple pole

C) Pole of order 2      D) Essential singularity

61. If we draw a sample of size n from a given finite population of size N, then the total number of possible sample is

A) $\frac{N!}{n!(N-n)!}$     B) $\frac{N!}{(N-n)!}$     C) $\frac{N!}{N!(N-n)!}$     D) None of these

62. A random sample of 500 apple was taken from a large consignment and 60 were found to be bad. The proportion of bad apples in a sample

A) 0.12     B) (8.61% , 15.38%)   C) Both (A) and (B)     D) None of these

63. A survey of 800 families with four children each revealed the following distribution

No. of boys:     0     1     2     3     4

No. of girls:     4     3     2     1     0

No. of families:     32     178     290     236     64

Then the expected frequency of 3 male birth is

A) 300     B) 50     C) 200     D) 800

64. The mean weekly sales of soup bars in departmental store was 146.3 bars per store. After an advertising campaign the mean weekly sales in 22 stores for a typical week in creased to 153.7 and showed a standard deviation of 17.2. The t- static is

A) $\frac{17.2 \times \sqrt{21}}{7.4}$     B) $\frac{7.4}{17.2 \times \sqrt{21}}$     C) $\frac{7.4 \times \sqrt{21}}{17.2}$     D) $\frac{7.4}{21/\sqrt{17.2}}$

65. In a school, there are 1000 students , out of which 430 are girls. It is known that out of 430, 10% of the girls study in class XII. What is the probability that a students chosen randomly studies in Class XII given that the chosen student is a girl?

A) 0.1     B) 0.01     C) 0.43     D) 1/43

66. Which one is incorrect?

A) If f(z) is analytic in the whole plane and real on the real axis and imaginary on the imaginary axis, then f(z) is odd function

8

B) The Taylor's series for the function $\frac{1}{1-z}$ at $z = 0$ is $1 - z + z^2 - z^3 +$ ……………. for $|z| < 1$

C) $f(z) = \sin z$ is an analytic function

D) $I_m z$, $Re(iz)$, $\overline{z}$ are not Analytic

67. The value of $\int_C \tan z \, dz$, where C is $|z| = 2$ is …………..

   A) $2\pi i$        B) $-4\pi i$        C) $4\pi i$        D) 0

68. The residue of $\frac{z^2 - 1}{(z^2 + 1)^2}$ at $z = i$ is …………….

   A) 0        B) -1        C) 1        D) 2i

69. In the laurent's series expansion of $f(z) = \frac{1}{(1-z)(z-2)}$ valid in the domain $|z| > 2$, the coefficient of $\frac{1}{z^2}$ is ………….

   A) 1        B) -1        C) 0        D) -3

70. If f(z) is analytic function and $f'(z)$ is continuous at each point within or on a closed curve C, then $\int_c f(z) \, dz$ is …………

   A) $2\pi i$        B) $-2\pi i$        C) 0        D) None of these

71. If $P_x(S)$ denotes the probability generating function (p.g.f) of the random variable X, then the p.g.f. of the random variable $Y = mX + n$, where $m$ and $n$ are intergers ($m \neq 0$) is given by

   A) $sP_x(S)$        B) $sP_x(S^m)$        C) $s^m P_x(S^n)$        D) $s^n P_x(S^m)$

72. If $X$ is an $F(m, n)$ random variable, where $m, n > 2$, then $E(x) . E\left(\frac{1}{x}\right)$ equals

   A) $\frac{mn}{(m-2)(n-2)}$        B) $\frac{m(n-2)}{n(m-2)}$        C) $\frac{n(n-2)}{m(m-2)}$        D) $\frac{m(m-2)}{n(n-2)}$

73. In a PERT problem, if the expected time $t_e = \frac{l+4m+n}{6}$, then

A) $n$ is the optimistic time, $m$ is the pessimistic time and $l$ is the most likely time

B) $m$ is the optimistic time, $l$ is the pessimistic time and $n$ is the most likely time

C) $m$ is the optimistic time, $n$ is the pessimistic time and $l$ is the most likely time

D) $l$ is the optimistic time, $n$ is the pessimistic time and $m$ is the most likely time

74. The non degenerate basic feasible solution to the system of equations $x_1 + 2x_2 + x_3 = 4$ & $2x_1 + x_2 + 5x_3 = 5$ is

   A) $x_1 = 5; x_2 = 0; x_3 = -1$        C) $x_1 = 0; x_2 = 2; x_3 = 0$

   B) $x_1 = 0; x_2 = \frac{5}{3} 0; x_3 = \frac{1}{3}$        D) $x_1 = 2; x_2 = 1; x_3 = 0$

75. If the primal problem is min $Z = CX$ subject to $AX = b; X \geq 0$ then the corresponding dual problem is

   A) min $Z^* = b^T W$        B) Max $Z^* = b^T W$

subject to $A^T W \leq C^T$        subject to $A^T W \geq C^T$

$W \geq 0$        *W is unrestricted*

C) min $Z^* = b^T W$        D) min $Z^* = b^T W$

subject to $A^T W \geq C^T$        subject to $A^T W \leq C^T$

*W is unrestricted*        W is unrestricted

76. Let X be a normed space and let $\{x_n\}$ be a sequence in X. Then which one of the following is not true.

A) $x_n \overset{w}{\to} x$ ($x_n$ converges weekly to x, then x is unique)

B) If $x_n \to x$ in X then $x_n \overset{w}{\to} x$ in X

C) If $x_n \overset{w}{\to} x$ in X, then $x_n \to x$ in X

D) $\{x_n\}$ is weak convergent in X, then $\{x_n\}$ is a bounded sequence in X

77. Let X be a normed space with $\| \ \|$ on it. For all $x, y \in X$, then $| \|x\| - \|y\| |$

A) $\leq \|x - y\|$      B) $\geq \|x - y\|$      C) $> |x - y|$      D) $= \|x\| - \|y\|$

78. An innerproduct space which is complete in the norm induced by the inner product is called a

A) A Banach space    B) A Hilbert space    C) A Banach algebra    D) A dual space

79. $\int\limits_0^\delta \frac{g(t)(\sin \propto t)}{t} dt$ is called as

A) Lebesgue intergrals        B) Riemann integrals

C) Dirichlet's integrals        D) Fourier integrals

80. "If $\{a_k\}$ and $\{b_k\}$ are any sequences of real numbers such that $\Sigma (a_k^2 + b_k)^2 < \infty$, then there exists $f \in L^2$ $[-\pi, \pi]$ whose Fourier coefficients are precisely the $a_k$ and $b_k$" is called

A) Parsevals theorem        B) Riesz – Fisher theorem

C) Jordan's theorem        D) Weierstrass theorem

81. The shortest curve joining two fixed points on a given surface is called a

A) Cycloid      B) Geodesic      C) Catenary      D) Helix

82. If the radius of spherical curvature is constant, the curve

A) lies on a sphere        B) has a constant curvature

C) either lies on a sphere or has a constant curvature      D) None of these

83. For the parametric representation of a point on the surface of the cone : $(u \cos v, \ u \sin v, \ u \cot \alpha)$ Which one is incorrect?

A) The parametric curves are orthogonal

B) The Equation to the tangent plane at any point

is $(X - x)(-u \cos v \cot \alpha) + (Y - y)(-u \sin v \cot \alpha) + (Z - z)u = 0$

C) Surface Normal is $(-\cos v \cos \alpha, -\sin v \cos \alpha, \ \sin \alpha)$

D) None of these

84. "The sum of the normal curvature is equal to the sum of principle curvatures" is called…………..
   A) Dupin's theorem
   B) Rodrigues formula
   C) Euler's Theorem
   D) Monge's theorem

85. Which one is incorrect?
   A) Torsion of a geodesic on the surface is $[N, N', r']$
   B) The surface which contains all the three types of points namely, elliptic, parabolic and hyperbolic points is Anchorring
   C) Every helix on a cyclinder is a geodesic
   D) $[r', r'', r'''] = k^2$

86. The train arrive at the yard in every 15 minutes and the service time is 33 minutes. The line capacity of the yard is 4 trains. Then line capacity of the yard is 4 trains. Then the probability that yard is empty is
   a) 0.237        b) 0.00237        c) 0.000237        d) 0.0237

87. In a generalized Poisson Queuing Model, define
   $n$ − Number of customers in the system
   $\lambda_n = $ Arrival rate of customers given n in the system
   $\mu_n = $ Departure rate of customers given n in the system
   $P_n = $ Steady state probability of n customers in the system
   $for n = 1,2,3, \dots the balance equation sis$
   A) $\mu_{n-1}P_{n-1} + \lambda_{n+1}P_{n+1} = (\lambda_n + \mu_n)P_n$
   B) $\lambda_{n-1}P_{n-1} + \mu_{n+1}P_{n+1} = (\lambda_n + \mu_n)P_n$
   C) $\lambda_{n-1}P_{n-1} + \lambda_{n+1}P_{n+1} = (\lambda_{n+2} + \mu_{n+2})P_{n+2}$
   D) $\mu_{n-1}P_{n-1} + \lambda_{n+1}P_{n+1} = (\lambda_{n+2} + \mu_{n+2})P_{n+2}$

88. In LPP, number of atmost solutions obtained by setting any $n$ variables among $(m + n)$ variables equal to zero is
   A) $(m + n2)!$        B) $n!$        C) $^{(m+n)}C_m$        D) $(m + n)P_m$

89. In a graphical solution of LPP, the optimal is at atleast one of the points
   a) on the boundary of the common region        b) in the common region
   c) at the corner points of the boundary        d) none of these

90. There are 1000 bulbs in the system; the survival rate is given below

| $week$: | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| $Bulbs in Operation$: | 1000 | 800 | 500 | 200 | 0 |

The group replacements of 1000 bulbs are Rs.100 and the individual replacement cost is Re.0.50 per bulb. The suitable group replacement policy is at the end of
   A) 1ˢᵗ week        B) 2ⁿᵈ week        C) 3ʳᵈ week        D) 4ᵗʰ week

91. $F[f(x)] = \frac{1}{\sqrt{2\pi}} \int\limits_{-\infty}^{\infty} f(t)e^{ixs} dx$, then F $\left[\frac{1}{\sqrt{x}}\right] = \dots$

A) $\frac{1}{s}$ , $s > 0$      B) $\frac{1}{\sqrt{s}}$ , $s > 0$      C) $\frac{1}{s^{3/2}}$ , $s > 0$      D) $\frac{1}{s^2}$ , $s > 0$

92. $F_c \left( \frac{e^{-ax}}{x} \right) =$ .........

     A) $\sqrt{2/\pi} \ tan^{-1} \ (s/a) + c$          B) $\sqrt{2/\pi} \ log \ (s^2 + a^2) + c$

     C) $\frac{-1}{\sqrt{2\pi}} \ log \ (s^2 + a^2) + c$          D) None of these

93. In $R \ \times \ R$ with usual metric, $Q \ \times \ Q$ is
     A) Closed          B) Not closed          C) Open          D) Compact

94. X and Y are two topological space and $f : X \rightarrow Y$. Then the condition says "for every subset A of X, $f \ (\bar{A}) \ \subseteq \ \overline{f(A)}$ " is equivalent to say that f is
     A) Closed          B) Continuous          C) Closed and open      D) Homeomorphism

95. The value of $\int_c \frac{e^z}{z-1} \ dz$ where C is $|z| = 1/2$

     A) 0          B) $2\pi i e$          C) $2\pi i \ e^{1/2}$          D) $2\pi i$

96. The value of $\int_{|z|=1} |z-1||dz|$ is ………………..

     A) 0          B) 8          C) $2\pi i$          D) $-2\pi i$

97. The integral $\int_\gamma f dz$, with continuous f, depends only on the end points of γ iff

     A) f is the derivative of an analytic function in Ω

     B) f is not derivative of an analytic function in Ω

     C) f is not well defined in Ω                  D) f is the function in Ω

98. Which one of the following is incorrect?

     A) every open interval is an open set

     B) every point of an open interval is an interior point

     C) The set $\left\{ \frac{1}{n} \ , \ n \ \in N \right\}$ is open

     D) every open interval is a neighbourhood of each of its points

99. Given the function $f(x) = \begin{cases} 1 & , & x \neq 0 \\ 0 & , & x = 0 \end{cases}$ , then

     A) f has removable discontinuity of first kind

     B) f has removable discontinuity of second kind

     C) f has jump at x = 0

     D) Both (A) and (C)

100. The value of C of Lagrange's mean value theorem if $f(x) \ = \ x \ (x - 1) \ (x - 2)$; $a \ = \ 0, \ b \ = \ 1/2$ is ………………..

     A) $\frac{1}{4}$          B) $\frac{1}{3}$          C) $\frac{6 - \sqrt{21}}{6}$          D) $\frac{6 + \sqrt{21}}{6}$

101. Which one is incorrect?

A) If $(l, m)$ are the direction coefficients of a direction in the tangent plane of a surface at P, then the value of $El^2 + 2Flm + Gm^2$ is 1

B) The equations of the indicatrix are $z = 2h, 2h = Lx^2 + 2 M\ xy + N\ y^2$, then the directions $(l_1, m_1)$, $(l_2, m_2)$ will be conjugate if $L\ l_1 l_2 + M\ (l_1\ m_2 + l_2\ m_1) + N\ m_1\ m_2$

C) If (l, m) are the direction coefficients of a direction then the magnitude of the vactor $l\overrightarrow{r_1} + m\overrightarrow{r_2}$ is 1

D) None of these

102. Let $\overrightarrow{r} = \overrightarrow{r}$ (u, v) be the equation of a surface and let $Edu^2 + 2Fdudv + Gdv^2$ be its fundamental form then at an ordinary point

A) $E > 0, EG - F^2 > 0$    B) $E > 0, G > 0, EG - F^2 > 0$

C) $F > 0, EG - F^2 > 0$    D) $G > 0, EG - F^2 > 0$

103.

$$Player A$$

Value of the game $Player B \begin{bmatrix} 10 & 5 & -2 \\ 13 & 12 & 15 \\ 16 & 14 & 10 \end{bmatrix}$ is

A) $\frac{5}{7}$    B) $\frac{3}{7}$    C) $90/7$    D) none of these

104. An NLPP in which the objective function can be expressed as a linear combination of several different one-variable functions of which some or all are non-linear, is called

A) a separable programming problem.    B) Convex Programming

C) Quadratic Programming    D) None of these

105. Choose the correct one

I)    The IBFS obtained by using NWC may be for away from optimum. And the IBFS obtained by VAM is very close to the optimum.

II)    If the number of occupied cells in less than $m + n - 1$, then the basic solution will be called degenerate

A) I only true    B) II only true    C) Both are true    D) both are wrong

106. The initial value problem $\frac{dy}{dx} = \frac{y-1}{x}$, $y(0) = 1$ has

A) only one solution    B) No solution

C) more than one solution    D) None of these

107. The bilinear transformation which maps $1, i, -1$ to $2, i, -2$ respectively is

A) $w = \frac{2i-6z}{iz-3}$    B) $w = \frac{zi-3}{2i-6}$    C) $w = \frac{2i-6z}{iz+3}$    D) $w = \frac{2i-6z}{iz-2}$ \

108. P is a projection on a linear space X. Choose the incorrect statement

A) (I- P) is a projection on X    B) $P^2 = P$

C) $R(P) \cap z(P) = \phi$    D) $X = R(P) + z(P)$

109. For the function f(x) = $|\sin x|$, $-\pi < x < \pi$ $a_0$ and $b_n$ are respectively

A) $\frac{4}{\pi}$ , 0       B) 0, $\frac{4}{\pi}$       C) $\frac{-4}{\pi(n^2-1)}$ , 0      D) None of these

110. The Fourier transform of $f(x) = \begin{cases} 1 - x^2, & |x| \le 1 \\ 0, & |x| > 1 \end{cases}$

A) $\frac{1}{\sqrt{2\pi}} \left[\frac{4}{s^3} \ (\sin s + s \cos s)\right]$       B) $\sqrt{2/\pi} \left[\frac{4}{s^3} \ (\sin s - s \cos s)\right]$

C) $\frac{1}{\sqrt{2\pi}} \left[\frac{4}{s^3} \ (\sin s - s \cos s)\right]$       D) $\sqrt{2/\pi} \left[\frac{4}{s^3} \ (\sin s - s \cos s)\right]$

111. Teaching machines designed by
A) Skinner      B) Crowder      C) Fletcher      D) Sydney Pressy
கற்பித்தல் இயந்திரத்தினை உருவாக்கியவர்
A) ஸ்கின்னர்B) கிரௌடர் C) ப்ளெட்சர்     D) சிட்னி பிரெஸ்ஸி

112. Paripadal belongs to
A) Padhupattu Nullgal       B) Pathinen keel kanakku Nullgal
C) Eitu thogai            D) Kurinji pattu
பரிபாடல் இடம்பெறுவது
A) பத்துப்பாட்டு நூல்கள்       B) பதினென் கீழ்கணக்கு நூல்கள்
C) எட்டுத்தொகை         D) குறிஞ்சிப்பாட்டு

113. Mobile education recommended by
A) Ivan Illich      B) Mc Donald      C) Stainer    D) All the above
நடமாடும் கல்வியினை பரிந்துரைத்தவர்
A) இவான் இலிச்        B) மெக்டொனால்டு
C) ஸ்டெய்னர்           D) மேற்கண்ட அனைத்தும்

114. 10+ 2+ 3 pattern through India implemented in which year?
நாடு முழுவதும் 10+2+3 கல்வி முறையை அமுல்படுத்திய ஆண்டு
A) 1976       B) 1972       C) 1979       D) 1982

115. Theoritical thinking skill – Intelligence advocated by
A) Wechsler      B) Binet     C) Stern       D) Termann
கருத்தியல் சிந்தனைத் திறனை நுண்ணறிவு என்று கூறியவர்
A) வெக்ஸ்லர்      B) பீனே       C) ஸ்டெய்ன்      D) டெர்மன்

116. Level of Aspiration Insisted by
A) Crow & Crow        B) Maslow & Kohler
C) Tempo & Hope      D) David Mc Donald
அலாவுநிலை பற்றி கூறிய அறிஞர்
A) குரோ மற்றும் குரோ        B) மாஸ்லோ மற்றும் கோலர்
C) டெம்போ மற்றும் ஹோப்      D) டேவிட் மெக்டொனால்டு

117. "Lateral thinking" was written by
A) Edward de Beno      B) Maltse    C) Guilford      D) Kohler
பக்கவாட்டு சிந்தனை என்ற நூலினை எழுதியவர்
A) எட்வர்டு டி போனோ      B) மால்டீஸ்   C) கில்போர்டு   D) கோஹ்லர்

118. A person related to Gaidance

14

A) Newsom          B) Hoyt          C) Tolbert          D) Rapport

வழிகாட்டலோடு தொடர்புடையவர்

A) நியூஸம்          B) ஹாய்ட்          C) டால்பெர்ட்          D) ரேப்பர்ட்

119. Which one is against for Behaviorism Concept

A) Cognitive Principle          B) Gestalt theory

C) Field study Concept          D) Instinet theory

நடத்தைக் கோட்பாட்டிற்கு எதிர்ப்பு தெரிவிக்கும் வண்ணம் உருவான கோட்பாடு

A) அறிவு சார் கோட்பாடு          B) முழுமை காட்சி கோட்பாடு

C) கள ஆய்வு கோட்பாடு          D) இயல்பூக்கக் கோட்பாடு

120. Identify the correct one regarding Non formal education

i) Adult education          ii) social education

iii) Adult literacy          iv) functional literacy

A) i, ii only          B) i only          C) i, ii, iii only          D) i, ii, iii, iv

முறைசாரா கல்வியினை பொருத்தமட்டில் சரியான ஒன்றினை தேர்ந்தெடு

i) முதியோர் கல்வி          ii) சமூகக் கல்வி

iii) முதியோர் எழுத்தறிவு          iv) வாழ்க்கை கல்வி

A) i,ii மட்டும்          B) i மட்டும்          C) i,ii,iii மட்டும்          D) i,ii,iii,iv

121. "Stagnation of vocational education" explained by

A) J. P. Nayak          B) V.K Nayar          C) Venugopal Rao          D) Ramachandran

தொழில்சார் கல்வியின் தேக்கநிலையை விளக்கியவர்

A) J.P நாயக்          B) V.K நாயர்

C) வேணுகோபால் ராவ்          D) இராமச்சந்திரன்

122. The search for what is right and what is wrong is called

A) Emotional Integration          B) Distance education

C) Peace education          D) Value eduction

எது சரி? எது தவறு என்று வாழ்நாளெல்லாம் தேடுகின்ற முயற்சியே

A) உணர்வூப்பூர்வ ஒருமைப்பாடு          B) தொலைதூரக் கல்வி

C) அமைதிக் கல்வி          D) மதிப்புணர்வுக் கல்வி

123. Harbour of pandiya [seaport]

A) Thondi          B) Kavaripoompattinam          C) Mamallapuram          D) Korkai

பாண்டியர்களின் துறைமுகம்

A) தொண்டி          B) காவேரிப்பூம்பட்டினம்          C) மாமல்லபுரம்          D) கொற்கை

124. Headquarters of UNESCO

A) Paris          B) Jenewa          C) New York          D) Dehaeck

UNESCO வின் தலைமை இடம்

A) பாரீஸ்          B) ஜெனிவர்          C) நியூயார்க்          D) திஹேக்

125. Non classroom learing introduced by

A) John Holt          B) Mc Donald          C) Francis parker          D) Steiner

பள்ளிக்கு வெளியே கற்றல் கருத்தினை அறிமுகப்படுத்தியவர்

15

A) ஜான் ஹால்ட்          B) மெக்டொனால்டு

C) பிரான்சிஸ் பார்க்கர்          D) ஸ்டெய்னர்

126. "Article 24" emphasizes

A) Environment protection

B) Education to all

C) Prohibition of employment of children in factories

D) Compulsory free education

அரசியல் சாஷன கோப்பு 24 கூறுவது [பரிந்துரைப்பது]

A) சூழ்நிலைப் பாதுகாப்பு          B) அனைவருக்கும் கல்வி

C) தொழிற்சாலைகளில் குழந்தைத் தொழிலாளர் ஒழிப்புமுறை

D) இலவச கட்டாயக் கல்வி

127. Humanity, science, social work are of the component of

i) craft education          ii) work experience

iii) SUPW     I          v) self employment programme

A) iii only     B) i & iii          C) ii & iv          D) All the above

மனிதநேயம், அறிவியல் சமுதாயப்பணி போன்றவற்றின் கூறுகளாவன

i) கைத்தொழில் கல்வி          ii) வேலை அனுபவம்

iii) SUPW          iv) சுய வேலை வாய்ப்பு திட்டம்

A) iii மட்டும்          B) i & iii          C) ii & iv          D) மேற்கண்ட அனைத்தும்

128. A person related to Analytical Psychology

A) Adler          B) Carl Rogers          C) Maslow          D) Jung

பகுப்பு உளவியலோடு தொடர்புடையவர்

A) அட்லர்          B) காரல் ரோஜர்ஸ்          C) மாஸ்லோ          D) யூங்

129. Who first laid Psycho Experiment?

A) Weber     B) Aristotle          C) Freud          D) Cat tell

உளவியல் பரிசோதனைகளுக்கு வித்திட்டவர்

A) வெபர்          B) அரிஸ்டாட்டில்          C) ப்ராய்டு          D) காட்டல்

130. Hurlock related to

A) Mental development          B) Moral development

C) Physical development          D) Social development

ஹர்லாக் என்பவர் எதனுடன் தொடர்புடையவர்

A) மனவளர்ச்சி          B) ஒழுக்க வளர்ச்சி

C) உடல் வளர்ச்சி          D) சமூக வளர்ச்சி

131. An Psychologist kohl related to which Country?

A) Russia          B) Japan          C) America          D) England

கோல் என்ற உளவியல் அறிஞர் எந்த நாட்டினை சேர்ந்தவர்

A) ரஷ்யா          B) ஜப்பான்          C) அமெரிக்கா          D) இங்கிலாந்து

132. Which one is not related to external factors of Attention?

A) Novelty        B) Movement        C) Intensity        D) Need

கீழ்க்கண்ட எந்த ஒன்று கவனத்தினை தீர்மானிக்கும் புறக்காரணி அல்ல?

A) புதுமை        B) அசைவு        C) செறிவு        D) தேவை

133. Steps involved in Learning by Insight

உட்காட்சி வழி கற்றலில் இடம் பெற்றுள்ள படிகள்

A) 7        B) 3        C) 4        D) 5

134. $SE_R = SH_R \times D \times V \times K - I_R - SO_R$ . This formula related to

A) Hierarchial Concept        B) Motivation Concept

C) Instinet theory        D) Drive reduction theory

$SE_R = SH_R \times D \times V \times K - I_R - SO_R$ என்ற சூத்திரம் எதனுடன் தொடர்புடையது?

A) படிநிலைக் கோட்பாடு        B) ஊக்கக் கோட்பாடு

C) இயல்பூக்கக் கோட்பாடு        D) உந்தக் குறைப்பு கோட்பாடு

135. Group factor theory advocated by

A) Spearmann        B) Thorndike        C) Thurstone        D) Binet

குழுகாரணி கோட்பாட்டினை கூறியவர்

A) ஸ்பியர்மேன்        B) தார்ண்டைக்        C) தர்ஸ்டன்        D) பீனே

136. Black foot diseased caused by the chemical

A) Fluorin        B) Nitrate        C) Sulphur        D) Arsenic

கருங்கால் நோயினை ஏற்படுத்தும் வேதிப்பொருள்

A) புளூரின்        B) நைட்ரேட்        C) சல்பர்        D) ஆர்சனிக்

137. In which five year plan high priority was given to the family planning progress

A) Sixth        B) Fifth        C) Fourth        D) Second

எந்த ஐந்தாண்டு திட்டத்தில் குடும்ப நலத்திட்டத்திற்கு அதிக முன்னுரிமை வழங்கப்பட்டது?

A) ஆறாவது        B) ஐந்தாவது        C) நான்காவது        D) இரண்டாவது

138. Durgabai deshmukh committee suggested

A) Special education        B) Womans education

C) Physical education        D) Health education

துர்காபாய் தேஷ்முக் கமிட்டி கூறுவது

A) சிறப்பு கல்வி        B) பெண் கல்வி        C) உடல் கல்வி        D) சுகாதார கல்வி

139. Who recommended preschool education

A) Piaget        B) Gandhiji        C) Pestolozzi        D) Froebel

பாலர் கல்வியை பிரிந்துரை செய்தவர்

A) பியாஜே        B) காந்திஜி        C) பெஸ்டாலஜி        D) புரோபெல்

140. "Schizo phrenia" is a kind of defence mechanism

A) Identification        B) Retionalization        C) Regression        D) Scapogotism

"ஷிஷோப்ரினியா" என்ன வகையான நடத்தை

A) ஒன்றுதல்        B) காரணம் கற்பித்தல்

C) பின்னோக்கம்        D) பலிகடா ஆக்கப்படுதல்

141. From which of the following countries, the concept of economic planning in India is derived?

A) Russia                                        B) USA                   C) UK         D) Australia

பொருளாதார திட்டமிடல் எந்த நாட்டில் இருந்து பெறப்பட்டது?

A) ரஷ்யா                  B) அமெரிக்கா        C) இங்கிலாந்து    D) ஆஸ்திரேலியா

142. Match the following:

| List – I | | List – II |
|---|---|---|
| a. Radio Iodine $I^{131}$ | - | 1. Blood Vessel blocks |
| b. Radio Sodium $Na^{24}$ | - | 2. Anaemia |
| c. Radio Phosphorous $P^{32}$ | - | 3. Skin diseases |
| d. Radio Iron $Fe^{59}$ | - | 4. Brain Tumor |

பொருத்துக:

| பட்டியல் — I | | பட்டியல் — II |
|---|---|---|
| a. கதிரியக்க அயோடின் $I^{131}$ | — | 1. இரத்தநாள அடைப்பு |
| b. கதிரியக்க சோடியம் $Na^{24}$ | — | 2. இரத்த சோகை |
| c. கதிரியக்க பாஸ்பரஸ் $P^{32}$ | — | 3. தோல் நோய் |
| d. கதிரியக்க இரும்பு $Fe^{59}$ | — | 4. மூளைக் கழலை |

| Codes: | a | b | c | d | | | a | b | c | d |
|---|---|---|---|---|---|---|---|---|---|---|
| A) | 4 | 1 | 2 | 3 | B) | 1 | 4 | 2 | 3 |
| C) | 4 | 1 | 3 | 2 | D) | 1 | 4 | 3 | 2 |

143. Identify the true statement:

A) When a moving car stops suddenly, the person sitting inside the car falls forward is by Newton's First Law of Motion.

B) A bullet fired from a gun can pierce a target due to its kinetic energy

C) Surface tension of water helps Detergents in cleaning the clothes.

D) All the above

சரியான கூற்றை அறிக:

A) ஓடும் கார் திடீரென நிறுத்தப்படும்போது, அதனுள் உட்கார்ந்திருக்கும் ஒரு நபர் முன்னோக்கி விழுவது நியூட்டனின் முதல் விதியைச் சார்ந்தது.

B) துப்பாக்கியிலிருந்து எரிக்கப்படும் குண்டு, இலக்கை கிழித்துச் செல்வதற்கான காரணம் அதன் இயக்க ஆற்றல்

C) சலவைத்தூள், துணியை சுத்தம் செய்ய உதவுவது, நீரின் பரப்பு இழுவிசை

D) அனைத்தும்

144. What is the Chronological sequence of the following events?

கீழ்க்கண்ட நிகழ்வுகளை காலவரிசைப்படுத்துக.

1. ஜாலியன் வாலாபாக் படுகொலை        2. கருப்பு சட்டம்

3. கிலாபாத் இயக்கம்               4. ஆகஸ்டு அறிக்கை

1. Jallian Walabakh                  2. Black Act

3. Khilafat Movement            4. August Declaration

Choose the Answer

A) 4, 1, 2, 3        B) 2, 1, 3, 4        C) 1, 2, 3, 4        D) 4, 2, 1, 3

145. The Supreme Court of India tenders advice to the President on a matter of law or fact

A) On its own initiative B) Only if the President seeks advice

C) Only if the matter relates to the Fundamental Rights of citizens

D) Only if the issue poses a threat to the unity and integrity of the country

குடியரசுத் தலைவருக்கு சட்டம் சம்பந்தமாக எந்த சமயத்தில் உச்சநீதிமன்றம் ஆலோசனை கூறலாம்?

A) தனது சொந்த முயற்சியில்

B) குடியரசுத் தலைவர் ஆலோசனை கேட்கும் பட்சத்தில் மட்டும்

C) அடிப்படை உரிமைகள் சம்பந்தமான செயல்களில் மட்டும்

D) நாட்டின் ஒற்றுமையையும், ஒருமைப்பாட்டையும் பாதிக்கும் செயல்களில் மட்டும்

146. Match the following

| District | – | Hills |
|---|---|---|
| A) Namakkal | - | 1) Agasthiyar hills |
| B) Salem | - | 2) Kolli hills |
| C) Vilupuram | - | 3) Kalrayan hills |
| D) Thiruneleveli | – | 4) Shervoroy hills |

பொருத்துக

| மாவட்டம் | — | மலை |
|---|---|---|
| A) நாமக்கல் | — | 1) அகத்தியர் மலை |
| B) சேலம் | — | 2) கொல்லிமலை |
| C) விழுப்புரம் | — | 3) கல்ராயன் மலை |
| D) திருநெல்வேலி | – | 4) சேர்வராயன் மலை |

| Code : | a | b | c | d | | a | b | c | d |
|---|---|---|---|---|---|---|---|---|---|
| A) | 2 | 4 | 1 | 3 | B) | 4 | 2 | 1 | 3 |
| C) | 2 | 4 | 3 | 1 | D) | 4 | 2 | 3 | 1 |

147. Find true of the following in 2011 Census

1) Decade population growth in 2001 – 2011 is 17.64%

2) Kerala (93.9%) has the highest literacy rate and Bihar (63.8%) has the lowest literacy rate

3) Density population highest (1084/1S.km) is

4) Haryana is the highest Sex Ratio

A) 1, 2 true     B) 1, 2, 3 true     C) 1, 2, 3, 4 true     D) 1, 4, 3, true

சரியானவற்றைக் காண் (2011 – Census)

1) 2001 – 2011 பத்தாண்டு மக்கள் தொகை வளர்ச்சி விகிதம் 17.64%

2) கேரளா (93.91) அதிக படிப்பறிவு

3) மக்கள் அடர்த்தி அதிகம் (1084 / 1 ச.கி.மீ) – பீகார்

4) ஹரியானா அதிக பாலின விகிதம்

A) 1, 2 சரி      B) 1, 2, 3 சரி      C) 1, 2, 3, 4 சரி      D) 1, 3, 4 சரி

148. The Olympic Game 2018 was held at

A) Russia      B) Britain      C) Japan      D) South Korya

ஒலிம்பிக் போட்டி 2018 நடைபெற்ற நாடு

A) ரஷ்யா      B) பிரிட்டன்      C) ஜப்பான்      D) தென்கொரியா

149. True of the following:

1. August 19 - World Humanities day

2. November 11 National Education day

A) 1 only      B) 2 only      C) Both of true      D) Both of not true

சரியானவற்றைக் காண்:

1. ஆகஸ்டு 19 உலக மனிதநேய தினம்

2. நவம்பர் 11 தேசிய கல்விதினம்

A) 1 மட்டும் சரி      B) 2 மட்டும் சரி

C) இரண்டும் சரி      D) இரண்டும் சரியல்ல

150. Best Parlimentarian Award for 2017

A) Nejma Habdullah      B) Gulam Nabi Azad

C) Dinesh Thiruvedi      D) Bharathru Hari Magedav

சிறந்த பாராளுமன்ற உறுப்பினர் விருது 2017 பெற்றவர்

A) நஜ்மா ஹெப்துல்லா      B) குலாம் நபி ஆசாத்

C) தினேஷ் திரிவேதி      D) பரத்ரு ஹாரி மகதாவ்

# TRB - P.G. Asst. – 2018 – Maths - Model - I

**Roll No.** ……………

**Name :** …………………..          **30.09.18**

| 1 | | 31 | | 61 | | 91 | | 121 | A |
|---|---|----|---|----|---|----|---|-----|---|
| 2 | | 32 | | 62 | | 92 | | 122 | D |
| 3 | | 33 | | 63 | | 93 | | 123 | D |
| 4 | | 34 | | 64 | | 94 | | 124 | A |
| 5 | | 35 | | 65 | | 95 | | 125 | A |
| 6 | | 36 | | 66 | | 96 | | 126 | C |

| No. | Ans | No. | Ans | No. | Ans | No. | Ans | No. | Ans |
|---|---|---|---|---|---|---|---|---|---|
| 7 |  | 37 |  | 67 |  | 97 |  | 127 | D |
| 8 |  | 38 |  | 68 |  | 98 |  | 128 | D |
| 9 |  | 39 |  | 69 |  | 99 |  | 129 | A |
| 10 |  | 40 |  | 70 |  | 100 |  | 130 | D |
| 11 |  | 41 |  | 71 |  | 101 |  | 131 | A |
| 12 |  | 42 |  | 72 |  | 102 |  | 132 | D |
| 13 |  | 43 |  | 73 |  | 103 |  | 133 | C |
| 14 |  | 44 |  | 74 |  | 104 |  | 134 | D |
| 15 |  | 45 |  | 75 |  | 105 |  | 135 | C |
| 16 |  | 46 |  | 76 |  | 106 |  | 136 | D |
| 17 |  | 47 |  | 77 |  | 107 |  | 137 | A |
| 18 |  | 48 |  | 78 |  | 108 |  | 138 | B |
| 19 |  | 49 |  | 79 |  | 109 |  | 139 | D |
| 20 |  | 50 |  | 80 |  | 110 |  | 140 | C |
| 21 |  | 51 |  | 81 |  | 111 | D | 141 | A |
| 22 |  | 52 |  | 82 |  | 112 | C | 142 | D |
| 23 |  | 53 |  | 83 |  | 113 | B | 143 | D |
| 24 |  | 54 |  | 84 |  | 114 | C | 144 | D |
| 25 |  | 55 |  | 85 |  | 115 | D | 145 | B |
| 26 |  | 56 |  | 86 |  | 116 | C | 146 | C |
| 27 |  | 57 |  | 87 |  | 117 | A | 147 | B |
| 28 |  | 58 |  | 88 |  | 118 | B | 148 | A |
| 29 |  | 59 |  | 89 |  | 119 | B | 149 | C |
| 30 |  | 60 |  | 90 |  | 120 | D | 150 | D |