Part A

1. What is the region for the iterated integral $\int_0^1 \int_0^y f(x,y)dxdy$

A) The triangle bounded by x=0, y=1, y=x
B) The triangle bounded by x=1, y=1, y=x
C) The triangle bounded by x=0, y=0, y=x
D) The triangle bounded by x=0, y=1, y=3x

2. The line integral $\oint (2y + \sqrt{1+x^5})dx + (5x - e^{y^2})dy$ around the circle $x^2+y^2=4$ is

A) 12π
B) $2\ \pi$
C) $6\ \pi$
D) 0

3. The line integral $\oint y^3z^2dx + 3xy^2z^2dy + 2xy^3zdz$ around the curve C with equation $\vec{R} = a \sin t\hat{i} + b\cos t\ \hat{j} + c\cos t\hat{k}$, $0 \le t \le 2\ \pi$ where $abc \neq 0$ is

A) $abc\ \pi$
B) $abc\frac{\pi}{2}$
C) $abc\frac{\pi}{3}$
D) 0

4. $\vec{R} = x\hat{i} + y\hat{j} + z\hat{k}$ $|R| = r = \sqrt{x^2+y^2+z^2}$ if $\vec{F} = \frac{F(r)\vec{R}}{r}$, where f (r) is a differential be function of r, then ∇. F is given by

A) $2\frac{f(r)}{r} - f'(r)$
B) $\frac{f(r)}{r}$
C) $\frac{f(r)}{r} + f'(r)$
D) $2\frac{f(r)}{r} + f'(r)$

5. Let S be the sphere $x^2 + y^2 + z^2 = a^2$. If $\vec{F} = r^2(x\ \hat{i} + y\ \hat{j} + z\ \hat{k})$ where $r^2 = x^2 + y^2 + z^2$ Then flux of $\vec{F}$ through S is

A) $2\pi a^5$
B) $4\pi a^5$
C) $2\pi a$
D) $4\pi a$

Telegram - House of Aspirants

House of Aspirants | houseofaspirants.in

6. If $\vec{F}$ is a vector field defined on a simply connected region of space such that curl $\vec{F} = \vec{0}$ Then

A) $\oint \vec{F}.d\vec{r} = 0$ for exactly one simple closed curve C

B) $\oint \vec{F}.d\vec{r}$ is not always independent of C

C) $\vec{F} = -\nabla f$ for some scalar field f

D) None of the above

7. The word equation

Line integral of $\vec{E}$ around a loop = $\frac{-\partial}{\partial t}$ (flux of $\vec{B}$ through the loop) has the following differential form

A) $\nabla \times \vec{E} = \frac{-\partial}{\partial t} \nabla.\vec{B}$

B) $\nabla \times \vec{E} = \frac{-\partial}{\partial t} (\nabla.\vec{B})\vec{n}$

C) $(\nabla.\vec{E})\vec{r} = \frac{-\partial}{\partial t} (\nabla \times \vec{B})$

D) $\nabla \times \vec{E} = \frac{-\partial \vec{B}}{\partial t}$

8. The conic r = e(d-rcosθ) If e>1 is a

A) Hyperbola

B) Ellipse

C) Parabola

D) Cone

9. The conic given by r = $\frac{12}{2+4\sin\theta}$ is

A) Hyperbda

B) Ellipse

C) Parabola

D) Pair of Lines

10. Conic r = $\frac{1}{4-3\cos\theta}$ is rotated by an angle $\pi/3$. The resulting equation is

A) $\frac{1}{4-3\sin\left(\theta-\frac{\pi}{3}\right)}$

B) $\frac{1}{4-3\cos(\theta-\pi/3)}$

C) $\frac{1}{4-3\tan\theta}$

D) $\frac{1}{4-3\cos(\theta+\pi/3)}$

12 / ?

Telegram - House of Aspirants

11. The domain of the function $f(x,y,z) = xy\log_e z + 3\tan^{-1}\frac{1}{2}z$

A) All of R^3
B) All of R^3 except the point (1,1,0)
C) All of R^3 for $z > 0$ except $z = (2n+1)\pi$
D) None of the above

12. Equation of the tangent plan to $z=x^2-2y^2$ at (3,2,1) is

A) $Z = x-3-8(y-2)+1$
B) $Z = 6x+(y-2)+1$
C) $Z-1 = 6(x-3)-8(y-2)$
D) $Z-1 = 6(x-3)+8y+7$

13. Equation of the tangent plane to the ellipsoid $\frac{x^2}{a^2}+\frac{y^2}{b^2}+\frac{z^2}{c^2}=1$ at $P = (x_0, y_0, z_0)$ is

A) $\frac{x_0^2}{a^2}x+\frac{y_0^2}{b^2}y+\frac{z_0^2}{c^2}z=1$
B) $\frac{x_0x}{a^2}+\frac{y_0y}{b^2}+\frac{z_0z}{c^2}=1$
C) $\frac{x}{x_0}+\frac{y}{y_0}+\frac{z}{z_0}=a^2b^2c^2$
D) *None of the above*

14. The length of the vector ∇f is

A) The average rate of increase of f
B) The maximum rate of increase of f
C) The minimum rate of increase of f
D) Is always half the magnitude of average of f

15. Let $f(x,y,z) = x^2-y+z^2$. The directional derivative of f at (1,2,1) in the direction of $4\hat{i}-2\hat{j}+4\hat{k}$ is

A) 3
B) 2
C) 1
D) 0

16. $\nabla\left(\frac{f}{g}\right)$ is

A) $\frac{g\nabla f-f\nabla g}{g2}$
B) $\frac{f\nabla g-g\nabla f}{g2}$
C) $\frac{\nabla f-\nabla g}{g2}$
D) None of the above

Telegram - House of Aspirants

House of Aspirants | houseofaspirants.in

17. If α is a constant and $w = f(x,y)$ where $x = u\cos\alpha - v\sin\alpha$ and $y = u\sin\alpha + v\cos\alpha$ Then

A) $\left(\frac{\partial\omega}{\partial x}\right)^2 + \left(\frac{\partial\omega}{\partial y}\right)^2 = \left(\frac{\partial\omega}{\partial u}\right)^2 + \left(\frac{\partial\omega}{\partial v}\right)^2$

B) $\left(\frac{\partial\omega}{\partial x}\right)^2 - \left(\frac{\partial\omega}{\partial y}\right)^2 = \left(\frac{\partial\omega}{\partial u}\right)^2 - \left(\frac{\partial\omega}{\partial v}\right)^2$

C) $\sin\alpha\left(\frac{\partial\omega}{\partial x}\right)^2 + \cos\alpha\left(\frac{\partial\omega}{\partial y}\right)^2 = \left(\frac{\partial\omega}{\partial u}\right)\left(\frac{\partial\omega}{\partial v}\right)$

D) $\sin^2\alpha\left(\frac{\partial\omega}{\partial x}\right)^2 + \cos^2\alpha\left(\frac{\partial\omega}{\partial y}\right)^2 = \left(\frac{\partial\omega}{\partial u}\right)^2 + \left(\frac{\partial\omega}{\partial v}\right)^2$

18. Distance of the origin from the plane $x+2y+3z=14$ is

A) $\sqrt{13}$

B) $\sqrt{80}$

C) $\sqrt{7}$

D) $\sqrt{14}$

19. If α, β, γ are angles of a triangle, then the maximum value of $\sin\alpha + \sin\beta + \sin\gamma$ is

A) 3

B) $\frac{3\sqrt{3}}{2}$

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

D) $7\sqrt{3}$

20. A cylinder has fixed volume. For minimum surface area, the relation between height h and radius r of base is

A) $r = 2h$

B) $2r = h$

C) $r = \sqrt{h}$

D) $2r = \sqrt{h}$

21. The group of automorptisms of the octic group D_4 has order

A) 8

B) 4

C) 6

D) 2

22. The group A_5 is

A) A non-abelian non-simple group

B) An abelian simple group

C) An abelian non-simple group

D) A non-abelian simple group

12 / /

Telegram - House of Aspirants

23. The smallest extension of **Q** having a root of $x^4 - 2 \in \mathbf{Q}[x]$ is
   A) The field $\{a+bu+cu^2+du^3 | a,b,c,d \in \mathbf{Q}\}$ & $u^4 - 2 = 0$
   B) The field $\{a+cu^2 | a,c \in \mathbf{Q}\}$ & $u^4 - 2=0$
   C) The field $\{a+du^3 | a, d \in \mathbf{Q}\}$ & $u^4 - 2= 0$
   D) None of the above

24. For spherical coordinates if $\vec{F}(r,\theta,\emptyset) = \frac{\hat{e}r}{r^2}$: then
   A) divergence theorem can never be applied to F
   B) divergence theorem always holds for $\vec{F}$
   C) holds for $\vec{F}$ for a sphere of radius r
   D) None of the above

25. In spherical coordinates $(r, \theta, \emptyset)$ the component $(\nabla \times \vec{F})_\emptyset$ is given by
   A) $\frac{1}{r}\frac{\partial}{\partial r}(rF_\theta) + \frac{1}{r}\frac{\partial F_r}{\partial \theta}$
   B) $\frac{1}{r}\frac{\partial}{\partial r}(F_\theta) + \frac{1}{r}\frac{\partial (rF_r)}{\partial \theta}$
   C) $\frac{1}{r^2}\frac{\partial}{\partial r}(F_\theta) - \frac{1}{r^2}\frac{\partial F_r}{\partial \theta}$
   D) $\frac{1}{r}\frac{\partial}{\partial r}(rF_\theta) - \frac{1}{r}\frac{\partial F_r}{\partial \theta}$

26. Let F be a field. Then its characteristic can be
   A) 0 or 2
   B) 0 or 3
   C) 0 or 7
   D) Any of the above

27. One composition series for Z/(30) is given by
   A) $[0] \subset [15] \subset [5] \subset G$,
   B) $[0] \subset [3] \subset [7] \subset G$
   C) $[0] \subset [15] \subset [10] \subset [2] \subset G$
   D) $[0] \subset [3] \subset G$

28. Solution of Initial Value Problem $\frac{dy}{dx} = \frac{y\cos x}{1+2y^2}; y(0) = 1$ is
   A) $|y|+y^2 = 1+\sin x$
   B) $\log_e |y| + y^2 = 1+\sin x$
   C) $e^y + y^2 = 1+\sin x$
   D) None of the above

$y = \frac{y \sin x}{1+2y^2}$

29. The complete integral of the equation $(p+q)(z-xp-yq)=1$; $p=\frac{\partial z}{\partial x}$, $q=\frac{\partial z}{\partial y}$ is

A) $z=ax+\frac{1}{a+b}-y$

B) $z=x-y+\frac{1}{a+b}$

C) $z=x^2-ax+by+\frac{1}{a+b}$

D) None of the above

30. For the linear partial differential equation $z(xp-yq)=y^2-x^2$ we have

A) $x^2-y^2+z^2=f(x+y)$

B) $x^2+y^2-z^2=f(xy)$

C) $x^2+y^2+z^2=f(xy)$

D) $x^2-y^2-z^2=f(xy)$

31. Polar of (p,q) to the conic $ax^2+2hxy+by^2+2gx+2fy+c=0$ is

A) $apx+h(py+qx)+bqy+g(p+x)+f(q+y)+c=0$

B) $aqx+h(px+qy)+bqx+g(q+x)+f(p+y)+c=0$

C) $ap^2x+h(p^2y+q^2x)+bq^2y+g(p^2+x)+f(q^2+y)+c=0$

D) None of the above

32. If C is a simple closed curve enclosing a region A, then

A) $A=\frac{1}{2i}\oint z\bar{z}dz$

B) $A=\frac{1}{2i}\oint \bar{z}^2dz$

C) $A=\frac{1}{2i}\oint (z-\bar{z})dz$

D) $A=\frac{1}{2i}\oint \bar{z}dz$

33. All the roots of $z^7-5z^3+12=0$ lie

A) On $|z|=2$

B) On $|z|=4$

C) between $|z|=1$ & $|z|=2$

D) between $|z|=2$ and $|z|=4$

34. The second term in the Laurentz Series expansion of $f(z)=\frac{1}{(Z+1)(Z+3)}$ for $|z|<1$ is

A) $\frac{3}{8}z$

B) $\frac{-4}{9}z$

C) $\frac{1}{2}z$

D) $\frac{2}{7}z$

Telegram - House of Aspirants

35. $\int_0^{\infty} \sin x^2 dx$ is

A) $\sqrt{\frac{\pi}{2}}$

B) $2\sqrt{\pi}$

C) $\frac{1}{2}\sqrt{\frac{\pi}{2}}$

D) $\sqrt{\pi}/2$

36. $\int_0^{\infty} \frac{\sin x}{x} dx$ is

A) does not exist

B) 0

C) $-\pi$

D) $\pi/2$

37. If $T : V \to V$ is injective linear transformation & V is finite dimensional, then

A) T^{-1} exists

B) T is onto

C) T is bijective

D) All of the above

38. Matrix $\begin{pmatrix} 2 & -1 & 1 \\ 0 & 1 & 4 \\ 0 & -2 & 0 \end{pmatrix}$ enlarges the volume by a factor of

A) 16

B) 8

C) 2

D) 4

39. Matrix representing a reflection in the line y=2x is

A) $\begin{pmatrix} -1 & 2 \\ 2 & 1 \end{pmatrix}$

B) $\begin{pmatrix} -\frac{3}{5} & \frac{4}{5} \\ \frac{4}{5} & \frac{3}{5} \end{pmatrix}$

C) $\begin{pmatrix} 2 & 4 \\ 4 & -2 \end{pmatrix}$

D) $\begin{pmatrix} 2 & 1 \\ 4 & 0 \end{pmatrix}$

HOUSE OF ASPIRANTS
houseofaspirants.in

40. If $M = \begin{pmatrix} 0 & 0 & -1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{pmatrix}$ then M^2 represents

A) A rotation of 120^0 about y-axis

B) A rotation of 120^0 about x-axis

C) A rotation of 180^0 about y-axis

D) A rotation of 180^0 about x-axis

41. Find the Fourier Transform of $f(t) = te^{-at}u(t)$.

A) $\frac{1}{(a-j\omega)^2}$.

B) $\frac{1}{(a+j\omega)^2}$.

C) $\frac{a}{(a-j\omega)^2}$.

D) $\frac{\omega}{(a-j\omega)^2}$.

42. According to Parseval's theorem the energy spectral density curve is equal to?

A) Area under magnitude of the signal.

B) Area under square of the magnitude of the signal.

C) Area under square root of magnitude of the signal.

D) None of these.

HOUSE OF ASPIRANTS houseofaspirants.in

43. Mellin transform of $\frac{1}{1+x}$ is

A) $\Gamma(s)\Gamma(s+1)$.

B) $\Gamma(s)\Gamma(s-1)$.

C) $\Gamma(s+1)\Gamma(s-1)$.

D) $\Gamma(s)$.

44. Inverse Laplace transform of $\frac{s}{s^2+a^2}$ is

A) $\frac{e^{iat}+e^{-iat}}{2}$

B) $\frac{e^{iat}-e^{-iat}}{2}$

C) $\frac{e^{iat}}{2}$

D) $\frac{e^{-iat}}{2}$

45. The initial value problem $y' = 2\sqrt{y}$, $y(0) = a$, has

A) A unique solution if $a < 0$

B) No solution if $a > 0$

C) Infinitely many solutions if $a = 0$

D) A unique solution if $a \geq 0$

46. Consider the functional $J(y) = y^2(1) + \int_0^1 y'^2(x)\,dx$, $y(0)=1$, where $y \in C^2[0,1]$. If y extremizes J then

A) $y(x) = 1 - \frac{1}{2}x^2$

B) $y(x) = 1 - \frac{1}{2}x$

C) $y(x) = 1 + \frac{1}{2}x$

D) $y(x) = 1 + \frac{1}{2}x^2$

47. The set of real numbers λ for which the boundary value problem $\frac{d^2y}{dx^2} + \lambda y = 0$, $y(0) = 0$, $y(\pi) = 0$ has non-trivial solution is

A) $\{n^2 \mid n \text{ is a positive integer}\}$

B) $(-\infty, 0)$

C) $\{\sqrt{n} \mid n \text{ is a positive integer}\}$

D) $\mathbb{R}$

HOUSE OF ASPIRANTS
houseofaspirants.in

48. Let $y(x)$ be the solution of $x^2y''(x) - 2y(x) = 0$, $y(1) = 1, y(2) = 1$. Then the value of $y(3)$ is

A) $\frac{11}{21}$

B) 1

C) $\frac{17}{21}$

D) $\frac{11}{7}$

49. The partial differential equation $\left.\begin{array}{l} u_{xx} + u_{yy} + \lambda u; \\ u(x,0) = u(x,1) = 0; \\ u(0,y) = u(1,y) = 0; \end{array}\right\} \begin{array}{l} 0 < x, y < 1 \\ 0 \le x \le 1 \\ 0 \le y \le 1 \end{array}$ has

A) A unique solution u for any $\lambda \in \mathbb{R}$

B) Infinitely many solutions for some $\lambda \in \mathbb{R}$

C) A solution for countably many values of λ

D) Infinitely many solutions for all $\lambda \in \mathbb{R}$

50. Which of the following is not a topological property

A) Openness

B) Closeness

C) Connectedness

D) Boundedness

51. A spring-mass system is governed by $\ddot{y} + \frac{1}{8}\dot{y} + y = 0$ where time t is measured in seconds. The first time the mass passes through equilibrium position is approximately.

A) 1.9s

B) 3s

C) 1.64s

D) 2s

52. A particle rests in equilibrium on a rough plane inclined at 30^0 to the horizontal. The coefficient of friction is greater than or equal to

A) $\frac{1}{\sqrt{3}}$

B) $\frac{2}{\sqrt{3}}$

C) $\frac{\sqrt{3}}{2}$

D) 4

53. When a particle performs small oscillations at the end of a spring, the period depends on
   A) The mass of the particle
   B) The modulus of elasticity
   C) The natural length of the spring
   D) All of the above

54. A particle is projected from a point on a plane which is inclined at 20^0 to the horizontal. The vertical plane containing the path of the projectile also contains a line of greatest slope of the plane. For the maximum range down the plane, the angle of projection from the horizontal is
   A) 35^0
   B) 45^0
   C) 60^0
   D) 80^0

55. The ratio of relative speeds in an elastic collision is given by
   A) Coefficient of friction
   B) Coefficient of restitution
   C) Acceleration g
   D) None of the above

56. What is the value of $\int_0^\infty e^{-x^2} dx$?
   A) $\sqrt{\pi}$
   B) $\frac{\sqrt{\pi}}{\sqrt{2}}$
   C) $\frac{\sqrt{\pi}}{2}$
   D) $\frac{\pi}{2}$

57. $\Gamma(n+1) = n!$ can be used when _____
   A) n is any integer
   B) n is a positive integer
   C) n is a negative integer
   D) n is any real number

HOUSE OF ASPIRANTS
houseofaspirants.in

House of Aspirants | houseofaspirants.in

58. The value of $\int_{-1}^{+1} x^2 P_3(x)dx$ is equal to

A) 0

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

C) $\frac{2}{5}$

D) $\frac{1}{2^2 3!}$

59. Which of the following is correct?

A) $\Gamma(2)\,\Gamma(3) = 2$

B) $\Gamma(2)\,\Gamma(3) = 12$

C) $\Gamma(2)\,\Gamma(3) = 3$

D) $\Gamma(2)\,\Gamma(3) = 13$

60. A Laplace transform exists when.....

A) The function is piece-wise continuous and of exponential order.

B) The function is piece-wise discrete and of differential order.

C) The function is piece-wise continuous and of differential order.

D) The function is piece-wise discrete and of exponential order.

61. Which of the methods is a direct method for solving simultaneous algebraic equations?

A) Relaxation method

B) Gauss seidel method

C) Jacobi's method

D) Cramer's rule

62. The parameter E which we use for least square method is called as.....

A) Sum of residues

B) Residues

C) Error

D) Sum of errors

63. A set of feasible solution to a Linear Programming Problem is.....

A) convex

B) polygon

C) triangle

D) bold

HOUSE OF ASPIRANTS houseofaspirants.in

Telegram - House of Aspirants

64. If the primal problem has n constraints and m variables then the number of constraints in the dual problem is.....
A) mn
B) m+n
C) m-n
D) m/n

65. To resolve degeneracy at the initial solution, a very small quantity is allocated in.....cell
A) occupied
B) unoccupied
C) no
D) finite

66. The coefficient of slack\surplus variables in the objective function are always assumed to be.....
A) 0
B) 1
C) M
D) -M

67. If X has a discrete uniform distribution, then var[X] is equal to.....
A) $\frac{N+1}{2}$
B) $\frac{N^2-1}{12}$
C) $\sum_{j=1}^{N} e^{jt}\frac{1}{N}$
D) None of these

68. For x = 0, 1, 2, ... random variable X is defined to have a Poisson distribution if the density of X is given by.....
A) $\frac{e^{-\lambda}\lambda^x}{x}$
B) $\frac{e^{-\lambda}\lambda^x}{x!}$
C) 0
D) None of these

HOUSE OF ASPIRANTS
houseofaspirants.in

69. If the independent event A and B are such that $0 < P(A) < 1$ and $0 < P(B) < 1$, then which of the following option is not correct?

A) A and B are mutually exclusive.

B) A and $\overline{B}$ are independent

C) $\overline{A}$ and $\overline{B}$ are independent

D) $P(A/B) = P(\overline{A}/B) = 1$

70. A certain number of articles manufactured in one batch were classified into three categories according to a particular characteristic, being less than 50, between 50 and 60 and greater than 60. If this characteristic is known to be normally distributed, the mean and standard deviation for this batch is (if 60%; 35% and 5% were found in these characteristics).

A) $\sigma = 7.543, \quad \mu = 48.092$

B) $\sigma = 3.843, \quad \mu = 7.982$

C) $\sigma = 11.843, \quad \mu = 5.945$

D) $\sigma = 1.645, \quad \mu = 9.543$

71. A finite Cartesian product of a connected space is

A) Closed

B) Separated

C) Hausdorff

D) Connected

72. In a topological space (X, τ) having D as dense set and C is any set containing dense set, then C, is

A) Interior set

B) Open set

C) Compact set

D) Dense set

73. If $X = \{a, b, c\}$, then how many topologies are possible from set X.

A) 9

B) 29

C) 27

D) 31

74. The dimension of the tangent space to an n-surface in R^{n+1} at a point is
A) 1
B) n
C) n-1
D) n+1

75. What is the surface of revolution obtained by rotation the plane curve $x_2 = 1$ about x_1 - axis
A) Plane
B) Sphere
C) Cylinder
D) Torus

76. The equation of the normal plane on the curve at P is :
A) $(R^2 - r) \cdot \dot{r}$
B) $(R - r) \cdot t$
C) $(R - r) \cdot b$
D) $R - n \cdot n$

77. The curvature and torsion of circular helix is :
A) $\kappa = 0$ and $\tau \neq 0$
B) $\kappa \neq 0$ and $\tau = 0$
C) curvature and torsion both are constant
D) None of these

78. Involutes of a circular helix are :
A) Plane curve
B) Sphere
C) Cone
D) Cylinder

79. Which one of the following sum is incorrect
A) $b_{pq} x^q y^p$
B) $b_{pq} x^p y^p$
C) $b_{pq} x^q$
D) None of the above

80. T_{pqr} is a .....

A) Covariant tensor of rank 3
B) Contravariant tensor of rank 2
C) Mixed tensor of rank 3
D) Contravariant tensor of rank 3

81. Number of inner product of tensors A^{l}_{mn} and A^{pq}_{r} is

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

82. The number of component of a tensor whose rank is r in n-dimensional space is

A) nr
B) n^r
C) r^n
D) $(nr)^2$

83. The moment of inertia of a thin spherical shell is....

A) $Mr^4/2$
B) Mr^2
C) $2/3Mr^2$
D) $2/5Mr^2$

84. A body of mass 'm' is moving uniformly along a circle having radius 'r'. The centripetal force on the body is:

A) $\frac{mv^2}{r}$
B) $\frac{mv^2}{r^2}$
C) $\frac{mv}{r^2}$
D) $\frac{mv}{r}$

85. For an object under uniform circular motion, which of the following remains constant?

A) Kinetic energy
B) Speed
C) Magnitude of acceleration
D) All of the above

Telegram - House of Aspirants

86. In a uniform circular motion:
   A) Both acceleration and speed changes
   B) Both acceleration and speed are constant
   C) Both acceleration and velocity are constant
   D) Both acceleration and velocity changes

87. For a body moving in a horizontal circular path with uniform speed, which of the following remains unchanged?
   A) velocity
   B) acceleration
   C) direction of velocity
   D) kinetic energy

88. The Gauss Jordan method reduces a original matrix into a ……..
   A) Skew Hermition matrix
   B) Non- symmetric matrix
   C) Identity matrix
   D) Null matrix

89. Which of the following transformations are allowed in the Gauss Jordan method?
   A) Swapping a column
   B) Swapping two rows
   C) Swapping two columns
   D) Swapping a row

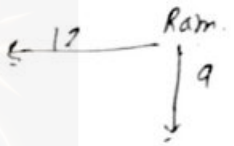
90. Matrix which does not have an inverse by solving it, is classified as which of the following?
   A) singular matrix
   B) non-singular matrix
   C) linear matrix
   D) unidentified matrix

HOUSE OF ASPIRANTS houseofaspirants.in

Part B

91. Answer the question based on following information.
I.'P x Q' means 'P is the brother of Q'.
II. 'P+Q' means 'P is the father of Q'.
III. 'P/ Q' means 'P is the sister of Q'.
Which of the following represents 'P is the uncle of Q'?
A) P + D / Q
B) P x D + Q
C) P + D x Q
D) P / D + Q

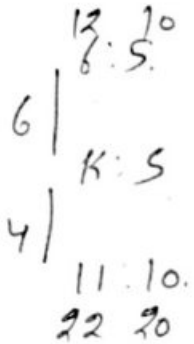
92. Ram went to his office, which is 9 kms towards the South from his hostel. His roommate Meghal went to a clinic, which is 12 kms towards the West from the hostel. What is the shortest distance between the clinic and Ram's office?
A) 12 m
B) 12 kms
C) 15 kms
D) 15 m



93. In a certain language 'pic vic nic' means 'winter is cold'; 'to nic re' means 'summer is hot'; 're it pa' means 'nights are hot';
Which of the following is the code for 'summer'?
A) to
B) nic
C) pic
D) vic

HOUSE OF ASPIRANTS
houseofaspirants.in

94. Six years ago, the ratio of the ages of Kunal and Sagar was 6:5. Four years hence, the ratio of their ages will be 11:10. What is Sagar's age at present?
A) 15
B) 16
C) 17
D) 18



Telegram - House of Aspirants

95. A wholesale tea dealer has 408 kilograms, 468 kilograms and 516 kilograms of three different qualities of tea. He wants it all to be packed into boxes of equal size without mixing. Find the capacity of the largest possible box.

A) 50
B) 36
C) 24
D) 12

408 468 516
4X102 4X117 4X129
4X3X34 4X3X39 4X3X43

96. A simple mechanical device has four gears A, B, C and D such that they mesh in the order A-B-C-D. The number of teeth in these gear is 10, 21, 12, 17 respectively. If we start the mechanism from rest, how many revolutions will the largest gear have to turn before one full cycle is completed and the gears are in the position from where they started?

A) 270
B) 340
C) 7140
D) 285

A B C D
10 21 12 17
5X2 3X7 3X4 17

97. If the LCM of two numbers is 750 and their product is 18750. Find the HCF of the numbers.

A) 40
B) 35
C) 25
D) 45

120
17
2040

25
18750
750

98. An amount of 2430 is divided among A, B and C such that if their shares be reduced by Rs 5, Rs.10 and Rs.15 respectively, the remainders shall be in the ratio of 3:4:5. Then, B's share was:

A) 605
B) 800
C) 790
D) 810

2430
-130

5 10 15
3 : 4 : 5

15 40 75 -10
800 3 : 4 : 5

99. From the time the front of a train enters a platform, it takes 25 seconds for the back of the train to leave the platform, while travelling at a constant speed of 54 km/h. At the same speed, it takes 14 seconds to pass a man running at 9 km/h in the same directions as the train. What is the length of the train and that of the platform in meters, respectively

A) 210 and 140
B) 162.5 and 187.5
C) 245 and 130
D) 175 and 200

$54 \times \frac{5}{18} = 15 m/s$

$15 \times 25 = 375 m$

$9 \times \frac{5}{18} = 2.5 m/s$

100. A contract is to be completed in 56 days and 104 men were set to work, each working 8 hours a day. After 30 days, 2/5 of the work is finished. How many additional men may be employed so that work may be completed on time each man now working 9 hours per day?

A) 46 men
B) 48 men
C) 52 men
D) 56 men

104 311 30D = 2
91 26D = 3

$\frac{104 \times 8 \times 30^{5}}{2} = \frac{x \times 1 \times 24}{3}$

101. Which sport's competition is known as the "Korn Ferry Tour"?

A) Golf
B) Baseball
C) Tennis
D) Chess

102. The term "Boycott of British Goods" was used in which of the following movements?

A) Swadeshi Movement
B) Quit India Movement
C) Non Cooperative Movement
D) Home Rule Movement

103. Rani-ki-Vav (the Queen's Stepwell), which is in the UNESCO World Heritage List, is located in which state?

A) Gujarat
B) Madhya Pradesh
C) Rajasthan
D) Uttar Pradesh

HOUSE OF ASPIRANTS
houseofaspirants.in

104. Which gas is most effective for ozone depletion?

A) CMC
B) CFC
C) CCF
D) CDC

105. In which year was "The National Commission for Women" set up?

A) 1992
B) 1990
C) 2015
D) 2012

106. Who was honoured for film and television achievements at the MTV Movie & TV Awards 2022?
A) Jennifer Lopez
B) Tom Cruise
C) Will Smith
D) Angelina Jolie

107. What is the repo rate after August, 2022 Monetary Policy Committee meeting?
A) 5.0%
B) 5.2%
C) 5.4%
D) 5.75%

108. Which state government has partnered with Linked In to boost employability skills of its students?
A) Punjab
B) Haryana
C) Kerala
D) Tamilnadu

109. Who has written the book "New Dimensions of India's Foreign Policy"?
A) Raghuram Rajan
B) Amartaya Sen
C) Atal Bihari Vajpayee
D) Amit Chaudhari

110. Which global organisation launched a new initiative called COVID-19 Technology Access Pool (C-TAP)?
A) World Health Organisation
B) World Trade Organisation
C) UNICEF
D) World Bank

111. 'ਅਹਿਕਰੁ ਕਰੇ ਸੁ ਅਹਿਕਰੁ ਪਾਏ' ਅਖਾਣ ਦਾ ਅਰਥ ਕੀ ਹੈ?
A) ਗਰੀਬ ਨਾਲ ਸਦਾ ਜੱਗੋਂ ਬਾਹਰੀ
B) ਅਮੀਰ ਦੀ ਸਦਾ ਧੱਕਾ-ਜ਼ੋਰੀ
C) ਅਭਿਮਾਨੀ ਦੀ ਸਦਾ ਪੁੱਗਣੀ
D) ਕਰਨੀ ਅਨੁਸਾਰ ਫਲ

HOUSE OF ASPIRANTS
houseofaspirants.in

112. ਜਿਸ ਕੁੜੀ ਵਿੱਚ ਮੁੰਡਿਆਂ ਵਾਲੀਆਂ ਆਦਤਾਂ ਹੋਣ ਉਸ ਨੂੰ ਕੀ ਆਖਦੇ ਹਨ?

A) ਜਨਾਨੜਾ
B) ਮੁੰਡੂ
C) ਮਾਹੀ-ਮੁੰਡਾ
D) ਖੁਸਰਾ

113. Time Barred ਦਾ ਅਰਥ ਹੈ:

A) ਮੁਅੱਤਲੀ ਸਮਾਂ
B) ਸੀਮਤ ਸਮਾਂ
C) ਮਿਆਦ ਪੁੱਗੀ
D) ਮਿਤੀ ਬੱਧ

114. ਹੇਠ ਲਿਖਿਆਂ ਵਿੱਚੋਂ ਸ਼ੁੱਧ ਸ਼ਬਦ ਚੁਣੋ।

A) ਬੈਹਤ
B) ਸੋਣਾ
C) ਗ਼ਜ਼ਲ
D) ਦੋੜ

115. 'ਮੈਂ ਆਪ ਉਸ ਨੂੰ ਚਾਹ ਪਾਰਟੀ ਤੇ ਛੱਡਣ ਗਿਆ 'ਵਾਕ ਵਿਚ' ਆਪ 'ਦਾ ਪ੍ਰਕਾਰਜ ਹੈ।

A) ਨਿੱਜ ਵਾਚਕ ਪੜਨਾਂਵ
B) ਪੁਰਖ ਵਾਚਕ ਪੜਨਾਂਵ
C) ਸਬੰਧਵਾਚੀ ਪੜਨਾਂਵ
D) ਨਿਸ਼ਚੇ ਵਾਚਕ ਪੜਨਾਂਵ

116. Change into indirect speech. She said, "Could you bring my book tonight?"

A) She asked me could I bring her book that night.
B) She asked me to bring her book that night.
C) She had asked me to bring her book that night.
D) She asked me to bring her book tonight.

117. Playing the piano may seem *very difficult* at first, but it gets easier with practice. Replace the italicized word with the correct substitute:

A) manageable
B) sparse
C) arduous
D) ominous

Telegram - House of Aspirants

House of Aspirants | houseofaspirants.in

118. Choose the correct phrasal or prepositional verb for 'to enter by force':

A) break into
B) break away
C) break down
D) break out

119. Choose one word substitute for an action that is likely to make people very angry.

A) inflationary
B) inflammable
C) commensurable
D) inflammatory

120. Many older people feel a slight pang of … as they think back on their schools days.

A) anger
B) tears
C) Pride
D) nostalgia

HOUSE OF ASPIRANTS
houseofaspirants.in

Telegram - House of Aspirants