PRACTICE

TEST

PAPER

1. Let $f: A \to B$ and $X \subseteq A, Y \subseteq A$ then which of the following is wrong ?

A) $f(X \cup Y) = f(X) \cup f(Y)$

B) $f(X \cap Y) = f(X) \cap f(Y)$

C) $f^{-1}(X \cup Y) = f^{-1}(X) \cup f^{-1}(Y)$

D) $f^{-1}(X \cap Y) = f^{-1}(X) \cap f^{-1}(Y)$

2. Which of the following statements is wrong ?

A) Countable union of countable sets is countable

B) The set of all rational numbers is countable

C) The set of all rational numbers in the interval [0, 1] is countable

D) The set $Q \times Q$ is not countable

3. The statement "If A is any nonempty subset of set of real numbers that is bounded above, then A has a least upper bound" is well known as

A) greatest lower bound axiom

B) least upper bound axiom

C) continuum axiom

D) none of the above

4. The Cantor set K is

A) countably finite

B) countably infinite

C) not countable

D) none of the above

5. The l.u.b of the set $\left\{1, \frac{1}{2}, \frac{1}{3}, \ldots\right\}$ is

A) 1

B) 0

C) does not exist

D) none of the above

6. Every monotone decreasing sequence of real numbers is

A) bounded above

B) bounded below

C) neither bounded above nor below

D) bounded

7. Let A be a bounded set, then which of the following is always true ?

A) both l.u.b and g.l.b belongs to A

B) neither g.l.b nor l.u.b belongs to A

C) either l.u.b or g.l.b belongs to A

D) exactly one of (A), (B) and (C) holds

8. Let $s_n = (-1)^n$ $(n \in I)$ then $\lim\sup_{n \to \infty} S_n = ...$

A) 0

B) 1

C) 1

D) does not exist

9. If $\{S_n\}_{n=1}^{\infty}$ is a sequence of real numbers that is not bounded above, then lim $\sup_{n \to \infty} S_n =$ ____________

A) 0

B) 1

C) infinity

D) minus infinity

10. The limit inferior of the sequence 1, 2, 3, 1, 2, 3, ... is

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

11. Which of the following is true ?

A) $\{(-1)^n\}_{n=1}^{\infty}$ is (C, 1) summable and $\{n\}_{n=1}^{\infty}$ is not (C, 1) summable

B) $\{(-1)^n\}_{n=1}^{\infty}$ is (C, 1) not summable but $\{n\}_{n=1}^{\infty}$ (C, 1) summable

C) neither $\{(-1)^n\}_{n=1}^{\infty}$ is (C, 1) summable nor $\{n\}_{n=1}^{\infty}$ (C, 1) summable

D) both $\{(-1)^n\}_{n=1}^{\infty}$ and $\{n\}_{n=1}^{\infty}$ are (C, 1) summable

12. Let $\{a_n\}_{n=1}^{\infty}$ be a non decreasing sequence of positive terms then which of the following is not true ?

A) $\sum_{n=0}^{\infty} 2^n a_{2^n}$ converges implies $\sum_{n=1}^{\infty} a_n$ converges

B) $\sum_{n=0}^{\infty} 2^n a_{2^n}$ diverges implies $\sum_{n=1}^{\infty} a_n$ diverges

C) $\sum_{n=0}^{\infty} 2^n a_{2^n}$ diverges need not imply $\sum_{n=1}^{\infty} a_n$ diverges

D) $\sum_{n=0}^{\infty} a_n$ converges implies $\lim_{n \to \infty} na_n = 0$

13. The series $1-1+\frac{1}{2}-\frac{1}{2}+\frac{1}{3}-\frac{1}{3}+$ ...... is

A) convergent

B) divergent

C) oscillatory

D) none of (A), (B) or (C)

14. Let $f(x) = x \quad (0 \le x \le 1)$. Let $\sigma = \left\{0, \frac{1}{4}, \frac{2}{4}, \frac{3}{4}, 1\right\}$ be a division of [0, 1] then

$U[f; \sigma] =$ ____________ .

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

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

C) 0

D) $\frac{1}{2}$

15. The function $f(x) = \frac{\sin x}{x} (x \neq 0)$ and $f(0) = 1$ is

A) Not Riemann integrable in [0, 1]

B) Riemann integrable in [0, 1]

C) Not Riemann integrable in [1, 2]

D) Not Riemann integrable in any interval [a,b]

16. Let f(x) be defined in [0, 1] as follows

f(x) = 1 when x is rational and

f(x) = 0 when x is irrational

Then the upper integral of f over [0, 1] is

A) 1

B) 0

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

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

17. The improper integral $\int_0^1 \frac{\sin x}{x^2}$ is

A) convergent

B) divergent

C) neither convergent not divergent

D) none of (A), (B) or (C)

18. Which one of the following statements is not true ?

A) Every convergent sequence is Cauchy

B) Every Cauchy sequence is convergent

C) A convergent sequence has a unique limit

D) If a Cauchy sequence has a convergent subsequence, then the wh sequence is convergent

19. In R^1 the sequence $\left\{\frac{1}{n}\right\}_{n=1}^{\infty}$ is

A) convergent but not Cauchy

B) not convergent but Cauchy

C) convergent Cauchy sequence

D) neither convergent nor Cauchy

20. Which one of the following statements is not true ?

A) Every Cauchy sequence is bounded

B) Every bounded sequence is Cauchy

C) Every monotone non decreasing sequence which is bounded abo convergent

D) The discrete metric space R_d is complete

21. Which one of the following statements is not true ?

A) The metric space l^2 is complete

B) A metric space is compact if it is totally bounded and complete

C) A metric space is compact iff it has Heine-Borel property

D) A finite metric space need not be compact

22. The closure of $(0, 1) \subset R^1$ is

A) (0, 1] B) [0, 1) C) (0, 1) D) [0, 1]

23. Let $f : M_1 \rightarrow M_2$ be a continuous function, then which of the following is false

A) f(A) is open whenever $A \subset M_1$ is open

B) $f^{-1}(A)$ is open whenever $A \subset M_2$ is open

C) $f^{-1}(A)$ is closed whenever $A \subset M_2$ is closed

D) f(A) is connected whenever $A \subset M_1$ is connected

24. Which one of the following is false ?

A) closed subset of compact space is compact
B) compact subset of a metric space is closed
C) continuous image of compact metric space is compact
D) the metric space R^1 is compact

25. Which one of the following is false ?

A) A continuous function on a closed bounded interval in R^1 is bounded
B) The set $(0,1) \subset R^1$ is compact
C) The metric space R^2 is complete
D) A continuous function on a compact metric space is always uniformly continuous

26. The function $f(x) = x^2, x \in R^1$ is

A) uniformly continuous on R^1
B) continuous but not uniformly continuous on R^1
C) not continuous on R^1
D) uniformly continuous but not continuous on R^1

27. Let M be a metric space with the property "M has no non-empty proper subset which is both open and closed". then M is

A) compact
B) dense
C) connected
D) not connected

28. The function $f(z) = |z|^2$ is

A) analytic at origin
B) differentiable at origin
C) not differentiable at origin
D) not continuous at origin

29. Let $f(z) = u + iv$ be a complex valued function of complex variable $z = x + iy$, the equations $\frac{\partial u}{\partial x} = \frac{\partial v}{\partial y}, \frac{\partial v}{\partial x} = -\frac{\partial u}{\partial y}$ are called

A) Laplace equations
B) Gauss' equations
C) Cauchy Riemann equations
D) None of the above

30. For a complex variable z, Taylor expansion for e^z is

A) $1+\frac{z}{1!}+\frac{z^2}{2!}+\ldots\ldots$

B) $1-\frac{z}{1!}+\frac{z^2}{2!}-\ldots\ldots$

C) $\frac{z}{1!}+\frac{z^2}{2!}+\ldots\ldots$

D) $\frac{z}{1!}-\frac{z^3}{3!}+\frac{z^5}{5!}-\ldots\ldots$

✓31. The set $\{z : |z-1| + |z-5| = 10\}$ represents

A) a circle

B) ellipse

C) hyperbola

D) parabola

✓32. The equation of a circle with center at a and radius r is

A) $z = a+r$

B) $|z-r| = |a|$

C) $|z-a| = r$

D) $(z-a)^2 = r^2$

✓33. The equation $|z-1| = |z-3|$ represents

A) the line $x - y = 2$

B) the circle $x^2 + y^2 = 4$

C) the line $x = 2$

D) the line $y = 2$

✓34. The points represented by z_1, z_2, z_3, z_4 lie on a circle if and only if their c ratio is

A) purely imaginary

B) real

C) zero

D) 1

✓35. Let $\arg\left(\frac{z-z_1}{z-z_2}\right)=4$, then z lies on a

A) circle

B) ellipse

C) hyperbola

D) parabola

36. The Taylor expansion of $\frac{1}{1-z}(|z|<1)$ is

A) $\frac{z}{1!}+\frac{z^2}{2!}+\ldots\ldots$

B) $1+\frac{z}{1!}+\frac{z^2}{2!}+\ldots\ldots$

C) $1 + z + z^2 + \ldots.$

D) $1 - z + z^2 - \ldots.$

✓37. Let $\omega = (\cos\theta + i\sin\theta)$ then $\omega^5 =$

A) $\cos^5\theta + i\sin^5\theta$

B) $\cos\theta + i\sin\theta$

C) $\cos 5\theta + i\sin 5\theta$

D) $\cos^5\theta - i\sin^5\theta$

38. Let $x + \frac{1}{x} = 2$, then $x^n + \frac{1}{x^n} =$ ________

A) 2

B) n

C) 2n

D) 2^n

39. The value of the integral $\int_{|z|=1} \frac{dz}{z}$ is

A) 2π

B) $2\pi i$

C) 0

D) 1

40. The value of the integral $\int_{|z-1|=1} \frac{z\,dz}{(z-1)^2}$ is

A) 2π

B) $2\pi i$

C) 0

D) 1

41. The function $f(z) = \bar{z}$ is

A) analytic everywhere

B) differentiable everywhere

C) nowhere differentiable

D) nowhere continuous

42. Let z_1, z_2 be complex numbers then $\arg(z_1z_2) =$ ________

A) $\arg(z_1)\arg(z_2)$

B) $\arg(z_1) + \arg(z_2)$

C) $\arg(z_1) - \arg(z_2)$

D) $\arg(z_1)/\arg(z_2)$

43. A nonempty subset H of a group (G, .) is a subgroup of G if and only if $a, b \in H$ implies

A) $a + b \in H$

B) $(a \cdot b)^{-1} \in H$

C) $a \cdot b^{-1} \in H$

D) $a \cdot b \in H$

44. Intersection of two subgroups of a group

A) is a subgroup

B) need not be a subgroup

C) is always empty

D) contains only one element

45. Let H be a subgroup of G. For $a, b \in G$, we say that a is congruent to b mod H if

A) a divides b

B) b divides a

C) $a \cdot b \in H$

D) $a \cdot b^{-1} \in H$

46. Let H be a subgroup of a finite group G. Then,

A) O(G) divides O(H)

B) O(H) divides O(G)

C) O(H) = O(G)

D) $O(H)^2$ divides O(G)

47. Let G be a finite group and H be a subgroup of G. Then index of H in G is eq to

A) number of elements in H

B) number of distinct right (left) cosets of H

C) number of distinct right (left) cosets of G

D) number of elements in G H

48. Let H and K be the two subgroups of a group G. Then HK is a subgroup of (and only if

A) HK = H

B) KH = K

C) HK < KH

D) HK = KH

49. An infinite cyclic group has

A) only one generator

B) two generators

C) three generators

D) infinite generator

50. If $f : G \to G'$ is a homomorphism then ker f is

A) not a subgroup

B) abelian subgroup

C) normal subgroup

D) cyclic subgroup

51. A homomorphism $f : G \to G'$ is one-one if and only if

A) ker f is nontrivial

B) ker f = ϕ

C) ker f = {e}

D) ker f = G

52. A cycle of a permutation $f = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 \\ 4 & 2 & 3 & 5 & 1 & 6 \end{pmatrix}$ is

A) (2 3 6)

B) (1 4 5)

C) (1 2 3)

D) (1 5 4)

53. A ring R with unity is called a division ring if

A) R is a group w.r.t. multiplication

B) R is a group w.r.t. addition

C) Non zero elements of R is a group w.r.t. multiplication

D) Non zero elements of R is a group w.r.t addition

54. The set of all even integers under addition and multiplication forms a ring

A) with unity
B) without unity
C) with zero divisors
D) with multiplicative inverse

55. A ring R is called simple if

A) R has nontrivial ideals
B) R has only trivial ideals
C) R has only one nontrivial ideals
D) None of these

56. Let R be a commutative ring with unity. An ideal M of R is called maximal ideal of R if and only if

A) R/M is a field

B) R/M is a division ring

C) R/M contains divisors of zero

D) R/M is a proper ideal

57. An ideal P of R is called a prime ideal of $a \cdot b \in P$ implies

A) $a \in P$ and $b \in P$.
B) $a \in P$ or $b \in P$
C) $a \notin P$ and $b \notin P$
D) a and b are prime

58. Fourier transform of a function f(x), F{f(x)} =

A) $\frac{1}{\sqrt{2\pi}} \int_{-\infty}^{\infty} e^{ipx} f(x)dx$

B) $\frac{1}{2\pi} \int_{-\infty}^{\infty} e^{ipx} f(x)dx$

C) $\frac{1}{2\pi} \int_{-\infty}^{\infty} e^{-ipx} f(x)dx$

D) $\sqrt{2\pi} \int_{-\infty}^{\infty} e^{ipx} f(x)dx$

59. The infinite Fourier sine transform of f(x), $0 < x < \infty$ is defined by $F_s\{f(x)\}$ =

A) $\sqrt{2\pi} \int_{0}^{\infty} f(x) \sin px \, dx$

B) $\sqrt{\frac{2}{\pi}} \int_{0}^{\infty} f(x) \sin px \, dx$

C) $\frac{1}{\sqrt{2\pi}} \int_{0}^{\infty} f(x) \sin px \, dx$

D) $\sqrt{\frac{\pi}{2}} \int_{0}^{\infty} f(x) \sin px \, dx$

60. If $\tilde{f}_c(p)$ is a Fourier cosine transform of f(x) then Fourier cosine transform of f(ax) is

A) $\frac{1}{a}\tilde{f}_c(ap)$

B) $a\tilde{f}_c(ap)$

C) $a\tilde{f}_c\left(\frac{p}{a}\right)$

D) $\frac{1}{a}\tilde{f}_c\left(\frac{p}{a}\right)$

61. If $\tilde{f}(p)$ is a complex Fourier transform of f(x) then complex Fourier transform of f(x – a) is

A) $e^{ipa}\tilde{f}(p)$

B) $e^{ipa}\tilde{f}(p-a)$

C) $e^{-ipa}\tilde{f}(p)$

D) $e^{-ipa}\tilde{f}(p-a)$

62. If $\tilde{f}_s(p)$ is Fourier sine transform of f(x) then Fourier sine transform of f(x) cos ax is

A) $\frac{1}{2}\left[\tilde{f}_s(p+a)-\tilde{f}_s(p-a)\right]$

B) $\frac{1}{2}\left[\tilde{f}_s(p+a)+\tilde{f}_s(p-a)\right]$

C) $2\left[\tilde{f}_s(p+a)+\tilde{f}_s(p-a)\right]$

D) None of these

63. If $\tilde{f}(p)$ is a complex Fourier transform of f(x) then complex Fourier transform of f′(x) is

A) $ip\tilde{f}(p)$

B) $p\tilde{f}(ip)$

C) $-p\tilde{f}(-ip)$

D) $-ip\tilde{f}(p)$

64. If F and G are integrable functions over $(-\infty,\infty)$ then convolution of F and G $H(x) = F*G(x) =$

A) $\int_{-\infty}^{\infty} F(u)\,G(u)\,du$

B) $\int_{-\infty}^{\infty} F(u)\,G(x-u)\,du$

C) $\int_{-\infty}^{\infty} F(x-u)\,G(x-u)\,du$

D) $\int_{-\infty}^{\infty} F(x+u)\,G(u)\,du$

65. The kernel of the Hankel transform $H_n\{f(x)\}$ is

A) $x\, J_n\,(px)$

B) $J_n(px)$

C) $\frac{1}{x} J_n(px)$

D) $x f(x)$

66. If $\tilde{f}(p) = \int_0^\infty f(r)\, r\, J_n(pr)\, dr$ is the Hankel transform of the function f(r) then by inversion formula, f(r) =

A) $\int_0^\infty \tilde{f}(p)\, p\, J_n(pr)\, dp$

B) $\int_0^\infty \tilde{f}(p)\, r\, J_n(pr)\, dp$

C) $\int_0^\infty \tilde{f}(p)\, pr\, J_n(pr)\, dp$

D) $\int_0^\infty \tilde{f}(p)\, J_n(pr)\, dp$

67. The Hankel transform of $\frac{e^{-ax}}{x}$ taking $xJ_0(px)$ as the kernel, is

A) $(a^2 + p^2)^{-1/2}$

B) $(a^2 - p^2)^{-1/2}$

C) $(a^2 - p^2)^{3/2}$

D) $(a^2 + p^2)^{3/2}$

68. The Hankel transform of $\frac{e^{-x}}{x}$ taking $x\, J_1(px)$ as the Kernel is

A) $\frac{[(1+p^2)^{-1/2} - 1]}{p}$

B) $\frac{[(1+p^2)^{1/2} - 1]}{p}$

C) $\frac{[(1-p^2)^{-1/2} + 1]}{p}$

D) $\frac{[(1-p^2)^{-1/2} - 1]}{p}$

69. If $\tilde{f}(p) = \frac{e^{-ap}}{p}$, $(n = 0)$ then $H^{-1}\{\tilde{f}(p)\} =$

A) $(a^2 + x^2)^{-1/2}$

B) (a^2+x^2)

C) $(a^2 - x^2)^{-1/2}$

D) $(a^2 + x^2)^{1/2}$

70. If p is a root of the equation $J_n(pa) = 0$ then $H_n\left\{\frac{df}{dx}\right\} =$

A) $\frac{p}{2n}[(n-1)H_{n+1}\{f(x)\} - (n+1)H_{n-1}\{f(x)\}]$

B) $\frac{2p}{n}[(n-1)H_{n+1}\{f(x)\} + (n+1)H_{n-1}\{f(x)\}]$

C) $\frac{p}{2n}[(n-1)H_{n-1}\{f(x)\} - (n+1)H_{n+1}\{f(x)\}]$

D) $\frac{2p}{n}[(n-1)H_{n-1}\{f(x)\} + (n+1)H_{n+1}\{f(x)\}]$

71. Let $T: U \rightarrow V$ be linear transformation and dimU = dim V. If T is on to then

A) R(T) = U
B) R(T) = V
C) dim R(T) < dim V
D) N(T) not equal to {0}

72. If $T: V_2 \rightarrow V_3$ is such that T(1, 0) = (1, 2, 3), T(0, 1) = (2, 3, 1) and $S: V_3 \rightarrow V_3$ is such that S(1, 0, 0) = (–1, 0, 1), S(0, 1, 0) = (0, 1, 2) and S(0, 0, 1) = (1, –1, 0) then (ST) (0, 1) is

A) (2, –1, 5)
B) (–2, 1, 5)
C) (2, –1, –5)
D) (–1, 2, 8)

73. Let $T: U \rightarrow V$ and $S: V \rightarrow W$ be two linear transformations then ST is one-one if

A) S is one-one
B) T is one-one
C) ST is onto
D) ST = {0}

74. A linear map T is idempotent if and only if

A) $T^{-1} = I$
B) $T^2 = I$
C) $T^2 = T$
D) $T = T^{-1}$

75. If $T: U \rightarrow V$ is linear transformation then Rank T + Nullity T =

A) dim U
B) dim V
C) infinity
D) dim U+dimV

76. The set {(1, 2), (2, 4) } is

A) Linearly independent
B) Linearly dependent
C) Basis of R^2
D) None of these

77. $|\langle u, v\rangle| \leq$

A) $\|u\|\|v\|$

B) $|u||v|$

C) $\|u\|+\|v\|$

D) None of these

78. $\|u+v\|^2+\|u-v\|^2$ is equal to

A) $\|u\|^2+\|v\|^2$

B) $\|u\|^2-\|v\|^2$

C) $2\left[\|u\|^2+\|v\|^2\right]$

D) $2\left[\|u\|^2-\|v\|^2\right]$

79. An orthogonal set of non-zero vectors in an inner product space V is

A) Linearly dependent

B) Orthogonal

C) Linearly independent

D) Zero space

80. The set {(1, 1), (2, 3) } is

A) Linearly dependent

B) Basis

C) Linearly independent

D) None of these

81. The least number of negative roots of the equation $x^5 + 2x^4 \quad 3x^3 - 8 = 0$ is

A) 2

B) 3

C) 4

D) 5

82. The equation of sphere centered at C(2, 3, –4) and radius 4 is

A) $x^2 + y^2 + z^2 - 4x - 6y + 8z - 13 = 0$

B) $x^2 + y^2 + z^2 - 4x + 6y + 8z + 13 = 0$

C) $x^2 + y^2 + z^2 - 4x - 6y + 8z + 13 = 0$

D) $x^2 + y^2 + z^2 - 4x - 6y - 8z - 13 = 0$

83. If one of the roots of an equation is $\alpha+i\beta$, then its one of the other roots is

A) $-\alpha+i\beta$

B) $-\alpha-i\beta$

C) $\alpha-i\beta$

D) $\beta-i\alpha$

84. The second degree equation of sphere with center (−u, −v, −w) and radius $\sqrt{u^2 + v^2 + w^2 - d}$ is

A) $x^2 + y^2 + z^2 + 2ux + 2vy + 2wz + d = 0$

B) $x^2 + y^2 + z^2 + 2ux + 2vy + 2wz - d = 0$

C) $x^2 + y^2 + z^2 - 2ux - 2vy - 2wz + d = 0$

D) $x^2 + y^2 + z^2 - 2ux - 2vy - 2wz - d = 0$

85. An equation of the lowest degree with rational coefficients having $\sqrt{5 + 2\sqrt{6}}$ as one of its roots, is

A) $x^4 + 10x^2 - 1 = 0$

B) $x^4 - 10x^2 + 1 = 0$

C) $x^4 - 10x^2 - 1 = 0$

D) $x^4 + 10x^2 + 1 = 0$

86. The expansion of cos x is

A) $1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \frac{x^4}{4!} + \ldots$

B) $x - \frac{x^3}{3!} + \frac{x^5}{5!} \ldots$

C) $1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \frac{x^6}{6!} + \ldots$

D) none of these

87. Let f(D) y = 0 be the linear differential equation with constant coefficients. If the auxiliary equation of this equation has the roots 2 and 3 then its complete solution is given by

A) $y = Ae^{3x} + Be^{2x}$

B) $y = Ae^{-3x} + Be^{-2x}$

C) $y = Ae^{-3x} + Be^{2x}$

D) $y = Ae^{3x} + Be^{-2x}$

where A and B are constant.

88. $1 - x + x^2 - x^3 + \ldots\ldots (x \neq 1)$ is the expansion of

A) $\frac{1}{1+x}$

B) $\frac{1}{1-x}$

C) e^x

D) log x

89. Let f(D) y = 0 be the linear differential equation with constant coefficients. If the auxiliary equation of this equation has the roots $\pm i$ then its complete solution is given by

A) $y = e^x (A \cos x + B \sin x)$

B) $y = e^{ix}(A\cos(x) + B \sin (x))$

C) $y = A \cos (x) + B \sin (x)$

D) $y = A \cos ix + B \sin ix$

where A and B are constant

90. The distance between two points $\left(4, \frac{4\pi}{6}\right)$ and $\left(2, \frac{\pi}{6}\right)$ is given by

A) $-2\sqrt{5}$

B) 20

C) $\sqrt{5}$

D) $2\sqrt{5}$

91. The function f(x, y) with $A = f_{xx}(a, b)$, $B = f_{xy}(a, b)$ and $C = f_{yy}(a, b)$ has an extreme value at (a, b) if

A) $AC - B^2 > 0$

B) $AC - B^2 < 0$

C) $AB - C^2 > 0$

D) $AB - C^2 < 0$

92. The Geometric series $\sum_{n=0}^{\infty}\left(\frac{1}{3}\right)^n$

A) is convergent

B) diverges to ∞

C) diverges to $-\infty$

D) oscillates

93. The value of the $\lim_{x \to \infty} x \sin\frac{1}{x}$ is equal to

A) –1

B) 0

C) 1

D) none of these

94. The value of $\beta(1, 2) =$

A) $\frac{1}{2}$

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

C) 2

D) 3

95. Which one of the following is not an indeterminate form ?

A) $\infty + \infty$

B) $\infty - \infty$

C) ∞ / ∞

D) 1^0

96. One of the solutions of the differential equation $\frac{d^2y}{dx^2} + P\frac{dy}{dx} + Qy = R$ is e^{-x} if

A) $1 - P - Q = 0$

B) $1 + P - Q = 0$

C) $1 + P + Q = 0$

D) $1 - P + Q = 0$

97. The Laplace Transform of $\frac{\sin t}{t}$ is $\tan^{-1}\left(\frac{1}{s}\right)$ then Laplace transform of $\frac{\sin at}{t}$ is

A) $\tan^{-1}\left(\frac{a}{s}\right)$

B) $\tan^{-1}\left(\frac{s}{a}\right)$

C) $\tan^{-1}(as)$

D) $\tan^{-1}\left(\frac{1}{as}\right)$

98. Solution of the differential equation yz log zdx – zxlog zdy + xydz = 0 is

A) $e^{x\log z} = cy$

B) $x + y + z = c$

C) $x\log z = cy$

D) None of these

99. The solution of partial differential equation $(D^2 - 7DD' + 12D'^2)z = 0$ is

A) $z = \phi_1(y - 3x) + \phi_2(y - 4x)$

B) $z = \phi_1(y + 3x) + \phi_2(y - 4x)$

C) $z = \phi_1(y - 3x) + \phi_2(y + 4x)$

D) $z = \phi_1(y + 3x) + \phi_2(y + 4x)$

100. The infinite series $\sum \frac{1}{n^{3/2}}$ is

A) convergent

B) divergent

C) oscillates

D) none of these
