**Limits, Indeterminate Forms**

**Choose the most appropriate option (a, b, c or d).**

Q 1. is equal to

(a)  (b)  (c) 1 (d) none of these

Q 2. is equal to

(a)  (b) 1 (c) 2 (d) none of these

Q 3. is equal to

(a) 1 (b) 0 (c)  (d) none of these

Q 4. , where a > b > 1, is equal to

(a) -1 (b) 1 (c) 0 (d) none of these

Q 5. is equal to

(a) loge 9 (b) loge 3 (c) 0 (d) 1

Q 6. is equal to

(a) log4 3 (b) 1 (c) log3 4 (d) none of these

Q 7. is equal to

(a) 1 (b) 0 (c) ∞ (d) none of these

Q 8. is equal to

(a) 1 (b) -1 (c) 0 (d) none of these

Q 9. is equal to

(a)  (b)  (c)  (d) 

Q 10. , 0 < p < 1, is equal to

(a) 0 (b) ∞ (c) 1 (d) none of these

Q 11. is equal to

(a)  (b)  (c)  (d) none of these

Q 12. is equal to

(a) 1 (b) 0 (c)  (d) none of these

Q 13. is equal to

(a) 2 (b) -2 (c)  (d) 

Q 14. is equal to

(a)  (b)  (c) 1 (d) none of these

Q 15. is equal to is equal to

(a) 2 (b) 4 (c) 8 (d) 0

Q 16. Let +.. to n terms. Then sn is equal to

(a)  (b) 3 (c)  (d) ∞

Q 17. Let the rth term, tr, of a series is given by . Then is

(a)  (b) 1 (c)  (d) none of these

Q 18. Let a = min {x2 + 2x + 3, x ∈ R} and . The value of is

(a)  (b)  (c)  (d) none of these

Q 19. is equal to

(a)  (b)  (c) 1 (d) none of these

Q 20. is equal to

(a) 0 (b) 1 (c)  (d) none of these

Q 21. is equal to

(a) 1 (b) 0 (c) ∞ (d) none of these

Q 22. is equal to

(a)  (b)  (c) 0 (d) none of these

Q 23. is equal to

(a)  (b) - (c) 0 (d) ∞

Q 24. is equal to

(a)  (b)  (c) 1 (d) none of these

Q 25. If f(4) = f, f'(4) = 1 then is equal to

(a) 0 (b) 1 (c) -1 (d) none of these

Q 26. The graph of the function y = f(x) has a unique tangent at the point (a, 0) through which the graph passes. Then is

(a) 1 (b) 0 (c) 2 (d) none of these

Q 27. Let f(x) be a twice-differentiable function and f"(0) = 2 then is

(a) 6 (b) 3 (c) 12 (d) none of these

Q 28. If f(x), g(x) be differentiable functions and f(1) = g(1) = 2 then

is equal to

(a) 0 (b) 1 (c) 2 (d) none of these

Q 29. If f(a) = 2, f'(a) = 1, g(a) = -1, g'(a) = 2 then is

(a) -5 (b)  (c) 5 (d) none of these

Q 30. is equal to

(a) ea/2 (b) ea (c) e (d) e2a

Q 31. 

(a) e (b) e1/2 (c) e-2 (d) none of these

Q 32. is equal to

(a) 1 (b) e (c) e2 (d) e-2

Q 33. is equal to

(a) 0 (b) 1 (c) e (d) e-1

Q 34. is equal to

(a) e (b) e-1 (c) e-2 (d) none of these

Q 35. If then

(a) λ = 1, μ = 2 (b) λ = 2, μ = 1 (c) λ = 1, μ = any real constant (d) λ = μ = 1

Q 36. is equal to

(a) 0 (b) 1 (c) -1 (d) none of these

Q 37. Let {x} denote the fractional part of x. Then is equal to

(a) 1 (b) 0 (c) -1 (d) none of these

Q 38. , where [.] denotes the greatest integer function, is

(a) 0 (b) 1 (c) -1 (d) nonexistent

Q 39. 

(a) exists and it is  (b) exists and it is -

(c) does not exist because x – 1 → 0 (d) does not exist because LH lim ≠ RH lim

Q 40. , where [.] denotes the greatest integer function, is

(a) 0 (b) -1 (c) not existent (d) none of these

Q 41. , where [.] denotes the greatest integer function, is

(a) 0 (b) 1 (c) not existent (d) none of these

Q 42. 

(a) is 0 (b) is 3 (c) is -3 (d) does not exist

Q 43. , where [.] denotes the greatest integer function,

(a) is 0 (b) is 1 (c) does not exist (d) none of these

Q 44. If 

0, [x] = 0, where [.] denotes the greatest integer function, then is equal to

(a) 1 (b) 0 (c) -1 (d) none of these

Q 45. Let f(x) = x2 – 1, 0 < x < 2

2x + 3, 2 ≤ x < 3

The quadratic equation whose roots are and is

(a) x2 – 6x + 9 = 0 (b) x2 – 10x + 21 = 0 (c) x2 – 14 x + 49 = 0 (d) none of these

Q 46. If [.] denotes the greatest integer function then is

(a) 0 (b) x (c)  (d) 

Q 47. is equal to

(a) 1 (b) 2 (c) 0 (d) none of these

Q 48. is equal to

(a) f(a) (b) af(a) (c) 0 (d) none of these

Q 49. is equal to

(a) 0 (b) 1 (c) -1 (d) none of these

Q 50. Let f(x) = sin x, x ≠ nx

2, x = 2π, where n ∈ ,

Then is

(a) 0 (b) 1 (c) 3 (d) none of these

Q 51. If f(x) continuous in [0, 1] and = 1 then is

(a) 1 (b) 0 (c) (d) none of these

Q 52. If f(x) is continuous and then is equal to

(a)  (b)  (c) 0 (d) none of these

**Choose the correct options. One or more options may be correct.**

Q 53. Let f(x) = 1 + , 0 ≤ x < 1

ax, 1 ≤ x < 2.

If exists then a is

(a) 1 (b) -1 (c) 2 (d) -2

Q 54. If α is a repeated root of ax2 + bx + c = 0 then is

(a) 0 (b) a (c) b (d) c

Q 55. If f(x) = |x – 1| - [x] = the greatest integer less than or equal to x, then

(a) f(1 + 0) = -1, f(1 – 0) = 0 (b) f(1 + 0) = 0 =- f(1 – 0)

(c) exists (d) does not exist

Q 56. If , a finite number, then

(a) a = 1 (b) a = 0 (c) b = 1 (d) b = -1

Q 57. Let tan α . x + sin α . y = α and α cosec α . x + cos α . y = 1 be two variable straight lines, α being the parameter. Let P be the point of intersection of the lines. In the limiting position when α → 0, the point P lies on the line

(a) x = 2 (b) x = -1 (c) y + 1 = 0 (d) y = 2

**Answers**

1b 2a 3c 4b 5a 6c 7b 8d 9d 10a

11a 12c 13c 14a 15b 16a 17c 18c 19b 20a

21b 22a 23c 24a 25b 26c 27a 28c 29c 30b

31d 32d 33b 34c 35c 36b 37a 38a 39d 40c

41c 42c 43c 44d 45b 46c 47a 48b 49a 50b

51a 52b 53bc 54b 55ad 56ac 57ac