**Inverse Circular Functions**

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

Q 1. If α satisfies the inequation x2 – x – 2 > 0 then a value exists for

(a) sin–1 α (b) sec–1α (c) cos–1α (d) none of these

Q 2. If α β are roots of the equation 6x2 11 + 3 = 0 then

(a) both cos–1 α and cos–1β are real

(b) both cos–1 α and cos–1 β are real

(c) both cot–1 α and cot–1α and are real

(d) none of these

Q 3. Let f(x) = sec–1x tan–1x. Then f(x) is real for

(a) x ∈ [–1, 1] (b) x ∈ R (c) x ∈ (–∞, –1] ∪ [1, ∞) (d) none of these

Q 4. If cos–1 x – sin–1 x = 0 then x is equal to

(a)  (b) 1 (c)  (d) 

Q 5. cosec–1 (cos x) is real if

(a) x ∈ [–1, 1] (b) x ∈ R

(c) x is an odd multiple of  (d) x is a multiple of π

Q 6. The principal value of sinis

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

Q 7. The principal value of cos–1is

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

Q 8. The principal value of sin–1 is

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

Q 9. The principal value of cos–1is

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

Q 10. The value of cos

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

Q 11. is the principal value of

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

Q 12. If cos–1 λ + cos–1μ + cos–1 v = 3π then λμ + μv + μλ is equal to

(a) – 3 (b) 0 (c) 3 (d) – 1

Q 13. If then is

(a) 0 (b) 0 (c) 5 (d) none of these

Q 14. If then is equal to

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

Q 15. The value of cos–1 is

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

Q 16. The value of tanis

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

Q 17. The formula cos–1 x holds only for

(a) x ∈ R (b) |x| ≤ 1 (c) x ∈ (–1, 1] (d) x ∈ [1, +∞)

Q 18. tan–1a + tan–1b, where a > 0, b > 0 ab > 1, is equal to

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

Q 19. The set of values of x for which tan–1 hold is

(a) R (b) [–1, 1] (c) [0, 1] (d) [–1, 0]

Q 20.  hold is

(a) |x| ≤ 1 (b) x ∈ R (c) 0 ≤ x < 1 (d) –1 ≤ x < 0

Q 21. If (x) = sin–1 then f(x) is equal to

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

Q 22. The formula 2sin–1 x = sin holds for

(a) x ∈ [0, 1] (b)  (c) x ∈ (–1, 0) (d) 

Q 23. cos–1 (cos x) = x is satisfied by

(a) x ∈ R (b) x ∈ [0, π] (c) x ∈ [–1, 1] (d) none of these

Q 24. If 2tan–1x + sin–1 is independent of x then

(a) x ∈ [1, −∞) (b) x ∈ [–1, 1] (c) x ∈ (–∞, –1) (d) none of these

Q 25. If tan–12, tan–13 are angles of a triangle then the third angle is

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

Q 26. is equal to

(a) 0 (b) π (c)  (d) none of these

Q 27. The value of tan is

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

Q 28. If sin–1 x cos–1 then x is

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

Q 29. The value of  is equal to

(a) cot–1 x (b) sec–1 x (c) tan–1 x (d) none of these

Q 30. The value of 2tan–1 is

(a)  (b)  (c) π (d) none of these

Q 31. The value of cot–13 + cosec–1+ is

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

Q 32. sin cot–1tan cos–1x is equal to

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

Q 33. The value of tan–1 is

(a) π (b)  (c)  (d) none of these

Q 34. The value of tan2(sec–12) + cot2(cosec–13) is

(a) 13 (b) 15 (c) 11 (d) none of these

Q 35. tan , is equal to

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

Q 36. The number of real solution of the equation is 

(a) 0 (b) 1 (c) 2 (d) infinite

Q 37. The number of real solutions of tan–1 is

(a) zero (b) one (c) two (d) infinite

Q 38. The number of positive integral solutions of the equation is 

(a) one (b) two (c) zero (d) none of these

Q 39. Considering principal values, the number of solutions of



(a) two (b) three (c) one (d) none of these

Q 40. The number of real solutions of (x, y), where |y| = sin x, y = cos–1 (cos x), –2π ≤ x ≤ 2π, is

(a) 2 (b) 1 (c) 3 (d) 4

Q 41. If cos–1 x > sin−1 x then

(a) x < 0 (b) – 1 < x < 0 (c) 0 ≤ x <  (d) – 1 ≤ x < 

Q 42. If cot–1,n ∈ N, then the maximum value of n is

(a) 1 (b) 5 (c) 9 (d) none of these

Q 43. The set of values of k for which x2 − kx + sin−1 (sin 4) > 0 for all real x is

(a) φ (b) (−2, 2) (c) R (d) none of these

**Type 2**

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

Q 44. Let f(x) = sin–1 x + cos–1 x. Then is equal to

(a)  (b) f(k2 – 2k + 3), k (c)  (d) f(–2)

Q 45. At x = , the value is real for

(a) tan–1x (b) cosec–1x (c) cos–12x (d) none of these

Q 46. If < |x| < 1 then which of the following are real?

(a) sin–1x (b) tan–1x (c) sec–1x (d) cos–1x

Q 47. Let tan–1.Then

(a) α < β (b) 4α – 3β = 0 (c) α + β =  (d) none of these

Q 48. Let f(x) = . Then

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

Q 49. If f(x) = cos–1 x + cos–1 then

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

Q 50. The value of tanis

(a) if 0 ≤ x ≤ 1 (b) if x > 1 (c) not finite if x > 1 (d) none of these

Q 51. α, β and γ are three angles given by

α = 2 tan–1 (– 1), β = sin–1and γ cos–1. Then

(a) α > β (b) β − γ (c) α < γ (d) none of these

Q 52. If 0 < x < 1 then tan−1‑is equal to

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

Q 53. One of the values of x satisfying tan (sec−1 x) = sin cos−1 is

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

Q 54. If sin−1 x + sin−1y = , cos−1 x − cos−1y = then the number of values of (x, y) is

(a) two (b) four (c) zero (d) none of these

Q 55. The solution set of the equation cos−1 x − sin−1 x = sin−1(1 − x) is

(a) [−1, 1] (b)  (c) [−1, 0] (d) none of these

**Answers**

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

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

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

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

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

49a,d 50a,c 51b,c 52a,b,c 53b,d 54d 55d