**Some Additional Topics**

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

**INFINITE SERIES**

Q 1. (1 – x)3/2 can be expanded in ascending powers of x if

(a) -1 < x < 1 (b) x < -1 (c) x > 1 (d) none of these

Q 2. (3 + x)p/q can be expanded in ascending powers of x if

(a) -1 < x < 1 (b) x > 3 (c) -3 < x < 3 (d) x < -3

Q 3. If x is positive, the first negative term in the expansion of (1 + x)27/6 is the

(a) 5th term (b) 7th term (c) 6th term (d) 8th term

Q 4. In the expansion of (1 – x)-3, |x| < 1, the coefficient of x7 is

(a) 36 (b) 8C7 (c) 45 (d) none of these

Q 5. In the expansion of , the coefficient of x4, if it exists, is

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

Q 6. The coefficient of x5 in the expansion of , is

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

Q 7. If , |x| < 1, then

(a) a1+ a2= 4 (b) a1 – a2 = 3 (c) ap = aq (d) none of these

Q 8. The coefficient of xn in the expansion of e2x+3 is

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

Q 9. The coefficient of x10 in the expansion of 10x in ascending powers of x is

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

Q 10. In the expansion of in ascending powers of x, the fourth term is

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

Q 11. The constant term in the expansion of is

(a) loge 3 (b)  (c)  (d) none of these

Q 12. If |x| < 1, the coefficient of x3 in the expansion of is

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

Q 13. The constant term in the expansion of is

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

Q 14. In the expansion of log10(1 – x), |x| < 1, the coefficient of xn is

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

Q 15. If |x| < 1, the coefficient of x2 in the expansion of is

(a)  (b) 2C1 (c)  (d) none of these

Q 16. The sum of the series 4C0 + 5C1x + 6C2x2 + 7C3x3 + …. to ∞ is

(a) (1 – x)-4 (b)  (c) (1 + x)-5 (d) none of these

Q 17. The sum of the series 2C0 – 3C1x2 + 4C2x4 – 5C3x6 + …. to ∞ is

(a)  (b) (1 – x2)-3 (c)  (d) none of these

Q 18. The sum of series to ∞ is

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

Q 19. The sum of the series to ∞ is

(a) 16 (b) 8 (c)  (d) none of these

Q 20. to ∞ is equal to

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

Q 21. to ∞ is equal to

(a) 4e (b) 3e (c) 2e (d) none of these

Q 22. to ∞ is equal to

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

Q 23. to ∞ is equal to

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

Q 24. +….. to ∞ is equal to

(a) log a + log b (b) log (c) log a – log b (d) none of these

Q 25. .x2n is equal to

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

Q 26. is equal to

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

Q 27. (i) If to ∞ = y then to ∞ is equal to

(a) –x (b) x (c) x + 1 (d) none of these

(ii) The sum of the series up to ∞ is equal to

(a) loge 2 – 1 (b) loge 2 (c) loge  (d) 2loge 2

**PARTIAL FRACTIONS**

Q 28. If identically then

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

Q 29. If f(x) is a function of x such that for all x ∈ R then f(x) is

(a)  (b)  (c) 1 − x (d) none of these

Q 30. If |x| < 1, the coefficient of xn in the expansion of is

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

Q 31. If |x| < ¸the coefficient of x4 in the expansion of is

(a) 1 (b) 2 (c) 21 (d) none of these

Q 32. The sum to infinite terms of the series



where a is a constant, is

(a)  (b)  (c) ∞ (d) none of these

SURDS

Q 33. If x = 1 + then the reciprocal of x is

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

Q 34. The value of is equal to

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

Q 35. The square root of 2x + is

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

Q 36. If x ∈ , y ∈ (where  = the set of integers) then

(a) x = -1, y = 12, (b) x = 1, y = -12 (c) x = 1, y = 12 (d) none of these

Q 37. If then the value of x2 + xy + y2 is

(a) 5 (b) 99 (c) 98 (d) none of these

Q 38. If then is equal to

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

VARIATION

Q 39. If x varies directly as y, and x = 2 when y is 3 then x = 3 when y is

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

Q 40. If x caries inversely as y, and x = 5 when y = 2 then for y = 5, x is

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

Q 41. If x ∝ yz and y ∝ xz then

(a) z ∝ xy (b) z is a constant (c) xyz is a constant (d) none of these

Q 42. A varies as B and C jointly, and A = 2 when . The value of A, when B = 2, , is

(a) 30 (b) 10 (c)  (d) none of these

Q 43. Let y ∝ p + q where p varies directly as x and q varies inversely as x2. If y = 19 when x = 2 or 3 then y in terms of x is

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

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

**INFINITE SERIES**

Q 44. In the expansion of (1 + x)-3

(a) the third term is 4C2x2, if |x| < 1 (b) the third term is 4C2, if x > 1

(c) the value of the third term is , when 

(d) the value of the third tem is , when x = -3

Q 45. If to ∞ then

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

Q 46. If eax + e-bx = p0 + p1x + p2x2 +….. to ∞ then

(a) p1 = a + b, p2 =  (b) 

(c)  (d) 

Q 47. If to ∞ then

(a)  (b)  (c)  (d) a1, a3, a5 are in HP

Q 48. The coefficient of xn, n ∈ N, in the expansion of is

(a) (-1)n/2, when n is an even integer (b) 0, when n is an odd integer

(c) 1, when n is an even integer (d) (-1)(n-1)/2, when n is an odd integer

**SURDS**

Q 49. Let and . Then

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

**VARIATION**

Q 50. Let x + y ∝ , x – y ∝ and z = 2, when y = 1, x = 3. Then

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

Q 51. If 2x + 3y ∝ then

(a) x2 + y2 ∝ xy (b) x3 + y3 ∝ (xy)3/2 (c) x4 + y4 ∝ x2y2 (d) none of these

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

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

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

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

41b 42a 43c 44ad 45ab 46bc 47acd 48ad 49abd 50ad

51abc