**Question Bank**

**Subject Name: Complex Analysis & Numerical Methods**

**Subject Code: CUTM1003**

1. A complex function is analytic in a domain D if

(a) not continuous at any point in D (b) not differentiable at any point in D

(c) defined and differentiable at any point in D (d) none of these

 2. Given, find its conjugate .

 (a) (b)

(c) d) none of these

 3. If is analytic in a domain D then

(a) (b)

(c) (d) none of these

 4. If then

(a) is continuous at (b) is not continuous at

(c) is not defined at (d) none of these

 5. If then

(a) is continuous at (b) is not continuous at

(c) is not defined at (d) none of these

1. Let then

(a) is continuous at (b) is not continuous at

(c) is not defined at (d) none of these

 7.

(a) differentiable at any point z (b) analytic at any point z

(c) not differentiable at any point z (d) none of these

 8. A complex function is analytic in a domain D if

(a) (b)

(c) (d)

9. is a harmonic function in a domain D if
(a) (b)(c) (d)

1. An analytic function is analytic in a domain D then

(a) (b)

(c) (d) none of these

11. is

(a) differentiable at any point z (b) analytic at any point z

(c) not differentiable at any point z (d) none of these

12. Cauchy-Riemann Equations in Cartesian form are

(a) (b)

(c) (d)

13. Cauchy-Riemann Equations in polar form are

(a) (b)

(c) (d)

 14. If is harmonic then

 (a) (b)

(c) (d)

 15. The value of the line integral

(a) (Counter clockwise) (b) (Counter clockwise)

(c) (Clockwise) (d) 0

 16. The value of the line integral

(a) (Counter clockwise) (b) (Counter clockwise)

(c) (Clockwise) (d) 0

 17. Find the value of  , where C= 

(a) (Counter clockwise) (b) (Counter clockwise)

(c) (Clockwise) (d) 0

 18. The value of the line integral



(a) (Counter clockwise) (b) (Counter clockwise)

(c) (Clockwise) (d) 0

 19. The value of the line integral

(a (Counter clockwise) (b) (Counter clockwise)

(c) (Counter clockwise) (d) (Counter clockwise)

 20. The value of the line integral

(a) (Counter clockwise) (b) (Counter clockwise)

(c) (Clockwise) (d) 0

 21. The value of the line integral

(a) (Counter clockwise) (b) (Counter clockwise)

(c) (Clockwise) (d) 0

 22. The value of the line integral

 (a) (Counter clockwise) (b) (Counter clockwise)

(c) (Clockwise) (d) 0

 23. The value of the line integral

 (a) (Counter clockwise) (b) (Counter clockwise)

 (c) (d) 1

 24. The value of the line integral

 (a) (Counter clockwise) (b) (Counter clockwise)

 (c) (d) 1

25. The value of the line integral

 (a) (Counter clockwise) (b) (Counter clockwise)

 (c) (Counter clockwise) (d) 0

26. The value of the line integral

 (a) (Counter clockwise) (b) (Counter clockwise)

 (c) (Counter clockwise) (d) (Counter clockwise)

27. The value of the line integral

 (a) (Counter clockwise) (b) (Counter clockwise)

 (c) (Counter clockwise) (d) (Counter clockwise)

28. The value of the line integral

(a) (Counter clockwise) (b) (Counter clockwise)

 (c(Counter clockwise) (d) 0

29. The value of the line integral

 (a) (Counter clockwise) (b) (Counter clockwise)

 (c) (d) 1

30. The value of the line integral

 (a) (Counter clockwise) (b) (Counter clockwise)

 (c) (Counter clockwise) (d) 0

31. The value of and is analytic over boundary and interior of

 the simple closed path C is

 (a) (Counter clockwise) (b) (Counter clockwise)

 (c) (Counter clockwise) (d) 0

32. Find the Taylor series expansion of the function ****in non-negative powers of *z*

 (a) (b)

 (c) (d)

33. Find the Taylor series expansion of the function at z=0.

 (a) (b)

 (c) (d)

34. Find the Taylor series expansion of the function

 (a) (b

 (c) (d)

35. Find the Taylor series expansion of the function

 (a) (b

 (c) (d)

36. Find the Taylor series expansion of the function , at z= a

 (a) (b

 (c) (d)

37. Find the Taylor series expansion of the function

 (a) (b

 (c) (d)

38. Find the Taylor series expansion of the function

 (a) (b

 (c) (d)

39. Find the Taylor series expansion of the function

 (a) (b)

 (c) (d)

40. Find the Taylor series expansion of the function ****in negative powers of *z*

 (a) (b)

 (c) (d)

41. Find the Taylor series expansion of the function

 (a) (b

 (c) (d)

42. Find the Taylor series expansion of the function sin π z, at z=1/2

 (a) (b

 (c) (d)

43. Find the Taylor series expansion of the function sin z, at z=π/2

 (a) (b

 (c) (d)

44. Find the Taylor series expansion of the function

 (a) (b

 (c) (d)

45. Find the Laurent series expansion of the function , valid for

 (a) (b

 (c) (d)

46. Find the Laurent series expansion of the function , valid for

 (a) (b

 (c) (d)

47. Find the Laurent series expansion of ,valid in the region.

 (a) (b

 (c) (d)

48. Find the Laurent series expansion of the function , valid for

 (a) (b

 (c) (d)

49**.** Find the Laurent series expansion of the function , with centre at

 (a) (b

 (c) (d)

50. Find the Laurent series expansion of the function , valid for

 (a) (b

 (c) (d)

**51.** Let be analytic. If then is constant.

52. Evaluate.

53. Find

54. Evaluate, taking h=1.

55. Certain corresponding values of are given below:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| x | 300 | 304 | 305 | 307 |
| f(x) = | 2.4771 | 2.4829 | 2.4843 | 2.4871 |

 Find by Lagrange’s interpolation formula.

56.Using Newton’s Forward formula ,find the value of f(1.6) from the following table:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| x | 1 | 1.4 | 1.8 | 2.2 |
| f(x) | 3.49 | 4.82 | 5.96 | 6.5 |

57. Integrate using Trapezoidal rule (take n=4).

58. Evaluate by Trapezoidal Rule taking h = 0.25.

59. Find the value of π by integrating

, using Simpson’s 1/3rd rule (take n=4)

60. Using fourth-order Runge –Kutta method, find the solution of ,with