QUESTION BANK

B.Sc. (Part- I) (Semester- I) (CBCS) Mathematics (Paper- I)

Differential Calculus

Q) Answer the following questions choosing the correct alternatives given Below them.

1) One of the values of $(sin\frac{\pi}{3} + i\, cos\frac{\pi}{3})^6$= ………..

(A) 2 (B) 1 (C) -1 (D) i

2) The value of $tan^{-1}(\cos\pi\ ) =$ ………

(A) $\frac{\pi}{2}$ (B) $\frac{-\pi}{2}$ (C) $\frac{\pi}{4}$ (D) $\frac{-\pi}{4}$

3) The value of | x+ iy | is ………

(A) non-negative real number (B) non-negative complex number

(C) negative complex number (D) negative real number

4) For z = 4+3i the value of Re (z^3) = ………..

(A) 44 (B) -44 (C) 33 (D) -33

5) For a complex number z, cosh(iz) = ………..

(A) cosiz (B) cos z (C) coshz (D) – coshz

6) If z = --1+ i , then using De Moivre's theorem, z^4 = ………..

(A) -4 (B) 4 (C) 4i (D) none of these

7) The value of tan h (log √3) = ……………

(A) 1 (B) 2 (C) $\frac{1}{2}$ (D) none of these

8) If tan (x+iy) = p+iq then tan (x-iy) = …………

(A) p-iq (B) P+iq (C) ip-q (D) p-q

9) If y = $\sin hx$, then $\frac{dy}{dx}$ = …….

(A) $\sin hx$ (B) $\cos hx$ (C) $-\sin hx$ (D) $-\cos hx$

10) The simplified form of $\frac{(\cos\theta+i\sin\theta)^3}{(\cos\theta-i\sin\theta)^3}$ is

(A) 0 (B) 1 (C) $\cos 6\theta + i\sin 6\theta$ (D) $\cos 6\theta - i\sin 6\theta$

11) If two complex numbers $z_1$and z_2 are such that $z_1 + z_2 = 0$

Then $\frac{1}{z_1} + \frac{1}{z_2}$ = ………

(A) 1 (B) 0 (C) -1 (D) i

12) If z = x+iy , then Im(z^2) = ……….

(A) xy (B) 2xy (C) x^2-y^2 (D) x^2+y^2

13) If y = e^{3x} then y_n = ……..

(A) $3^n e^x$ (B) $3^n e^3$ (C) x^3 (D)$3^n e^{3x}$

14) n^{th} derivative of $\sin x \cos x$ is …….

(A) $2^{n-1}\sin(2x + \frac{n\pi}{2})$ (B) $2^n \sin(2x + \frac{n\pi}{2})$

(C) $2^n \sin x$ (D) $2^n \sin 2x$

15) The value of D^5 $(2x + 3)^6$ is …….

(A) $6!\,2^5$ (2x+3) (B) $6!\,2^5(2x + 3)^6$

(C) $6!\,2^6$ (2x+3) (D) $6!\,2^5$ $(2x + 3)^2$

16) If y= $\cos 2x$ then y_{20} = ……….

(A) 2^{20} (B) $2^{20}\cos(2x + 10\,\pi)$

(C) $\cos 20x$ (D) $2^{20}\cos 20x$

17) If y = x^n then y_n = ……..

(A) nx (B) $n!^{x}$ (C) $n!$ (D) nx^{n}

18) We shall prove Leibnitz's theorem by using …….

(A) method of mathematical deduction

(B) method of mathematical induction

(C) method of contradiction

(D) method of generalization

19) If y= $\sin(ax+b)$, then y_5 = ……..

(A) $a^5\sin(ax+b)$ (B) $a^5\cos(ax+b)$

(C) -$a^5\sin(ax+b)$ (D) -$a^5\cos(ax+b)$

20) For any real number x , cos h^2x - sin h^2x = ……

(A) 1 (B) -1 (C) 2 (D) -2

21) $\sec h(-x) =$ ……..

(A) $\sec hx$ (B) - $\sec hx$ (C) 0 (D)1

22) The value of $i^i$is …….

(A) $\frac{\pi}{2}$ (B) - $\frac{\pi}{2}$ (C) $e^{\frac{\pi}{2}}$ (D) $e^{-\frac{\pi}{2}}$

23) If $\sin hz$ = i , then ……

(A) x=0, y=0 (B) z =$\frac{\pi}{2}$, y=0

(C) x=0 , y= $\frac{\pi}{2}$ (D) x= $\frac{\pi}{2}$, y= $\frac{\pi}{2}$

24) If x= $\tan h^{-1}(\frac{1}{2})$, then the value of $\sin h\ 2x$ = ………

(A) $\frac{3}{4}$ (B) $\frac{4}{3}$ (C) 2 (D) $\frac{1}{2}$

25) If x = $\cos\theta$+ i $\sin\theta$, then $x^n + \frac{1}{x^n}$ is ……

(A) 2sin($n\theta$) (B) 2 cos($n\theta$)

(C) 2($\cos n\theta + i\sin n\theta$) (D) none of these