Name of College - S.S. College, Jehanabad

Dept. - Mathematics

Topic - Objective Question on Hyperbolic Functions

Class - B.Sc. I (Hons.)

Time - 9 A.M. to 10:30 A.M.

Date - 26-04-2021

Teacher's Name - Somendra Kumar (Part time Teacher)

Objective Question On hyperbolic Functions :→

1. $\sinh i\theta$ is equal to—

(a) $i\sinh\theta$ (b) $\sinh\theta$

(c) $i\sin\theta$ (d) $\sin\theta$

2. $\sinh z$ is defined as.

(a) $\frac{e^z - e^{-z}}{2i}$ (b) $\frac{e^{iz} - e^{-iz}}{2}$

(c) $\frac{e^{iz} - e^{-iz}}{2i}$ (d) $\frac{e^z - e^{-z}}{2}$

(3) $\cosh^2 z - \sinh^2 z$ is equal to

(a) $\cosh 2z$ (b) e^z

(c) 1 (d) 0

4 The value of $\cosh^2 z + \sinh^2 z$ is

(a) 0 (b) 1

(c) $\cosh 2z$ (d) None of these.

(5) The period of $\sinh z$, $\cosh z$ and $\tanh z$ are respectively

(a) $2\pi, 2\pi, \pi$ (b) $\pi i, \pi i, 2\pi i$

(c) $2\pi i, 2\pi i, \pi i$ (d) $\pi, \pi, 2\pi$

(6) Which of the following result / formula is incorrect-

(a) $\sinh iz = i\sin z$ (b) $\cos z = \cosh iz$

(c) $\tan z = -i\tanh iz$ (d) None of these

(7) Which of the following formulae is correct?

(a) $\sinh z = -i\sin iz$ (b) $\cosh z = -\cos iz$

(c) $\tanh z = i\tan iz$ (d) None of these

(8) $\cos(\alpha + i\beta)$ is equal to

(a) $\cos\alpha\cos\beta - i\sin\alpha\sin\beta$ (b) $\cos\alpha\cosh\beta - i\sin\alpha\sinh\beta$

(c) $\sin\alpha\cosh\beta + i\cos\alpha\sinh\beta$ (d) $\sin\alpha\cosh\beta - i\cosh\alpha\sinh\beta$.

(9) $\sinh(\alpha + i\beta)$ is

(a) $\sinh\alpha\cos\beta - i\cosh\alpha\sin\beta$ (b) $\sinh\alpha\cos\beta + i\cosh\alpha\sin\beta$

(c) $\sinh\alpha\cosh\beta + i\cos\alpha\sinh\beta$ (d) $\sinh\alpha\cosh\beta - i\cosh\alpha\sinh\beta$

(10) value of $\cos h(A+B)$ is

(a) $\cos A\cos B + \sin A\sin B$ (b) $\cosh A\cosh B - \sinh A\sinh B$

(c) $\cosh A\cosh B + \sinh A\sinh B$ (d) $\cos A\cos B - \sin A\sin B$

(11) If $\cos(\theta + i\varphi) = e(\cos\alpha + i\sin\alpha)$ then value of $e\sin\alpha$ is

(a) $\cos\theta\cosh\varphi$ (b) $-\cos\theta\cosh\varphi$

(c) $\sin\theta\sinh\varphi$ (d) $-\sin\theta\sinh\varphi$

12. $\sinh(x+y)\cosh(x-y)$ is equal to

(a) $\sinh 2x + \sinh 2y$ (b) $\frac{1}{2}(\sinh 2x + \sinh 2y)$

(c) $\frac{1}{2}(\sinh 2x - \sinh 2y)$ (d) None of these

13. The Real part of $\sin(x+iy)$ is

(a) $\frac{1-\cos 2x\cosh 2y}{2}$ (b) $\frac{\cos 2x\cosh 2y}{2}$

(c) $\frac{1-\sin 2x\sinh 2y}{2}$ (d) $\frac{1+\sin 2x\sinh 2y}{2}$

(14) value of $\sinh^{-1}x$ is

(a) $\log[x + \sqrt{x^2+1}]$ (b) $\log[x + \sqrt{x^2-1}]$

(c) $\frac{1}{2}\log\frac{1+x}{1-x}$ (d) None of these.

(15) value of $\tanh^{-1}x$ is equal to

(a) $a\tan^{-1}(ix)$ (b) $-i\tan^{-1}(ix)$

(c) $\frac{1}{2}\tan^{-1}(ix)$ (d) $\tan^{-1}\left(\frac{i}{x}\right)$

(16) $\tanh^{-1}z$ is equal to

(a) $\frac{1}{2}\log\frac{1+z}{1-z}$ (b) $\log\frac{1-z}{1+z}$

(c) $\frac{1}{4}\log\frac{1-z}{1+z}$ (d) None.

(17) Value of $\sinh^{-1}x$ is equal to

(a) $\cosh^{-1}\frac{x}{\sqrt{1+x^2}}$ (b) $\tanh^{-1}\frac{x}{\sqrt{1+x^2}}$

(c) $\tanh^{-1}\frac{x}{\sqrt{1+x^2}}$ (d) $\operatorname{sech}^{-1}\frac{x}{\sqrt{1+x^2}}$

(18) $\sinh 0 =$

(a) 0 (b) 1

(c) ∞ (d) None.

(19) The statement that hyperbolic functions have imaginary periods is True / False

(20) Circular functions have real periods False / True

(21) The inverse hyperbolic functions are many valued True / False

(22) Any positive quantity has one real logarithm and infinite number of imaginary logarithm.

True / False