Module-3: Complex Numbers (Q.1 to Q.20)

		Module-1 - Complex Numbers (Q.01 to Q.20)
1.		$If\,(1+i)(1+2i)(1+3i)\ldots\ldots(1+Ni)=a+ib$, then $2\times5\times10\times\ldots\ldots\times(1+N^2)=?$
	Option A	$\sqrt{a^2+b^2}$
	Option B	a^2+b^2
	Option C	$\sqrt{a^2-b^2}$
	Option D	a^2-b^2
2.		If $\sqrt{a+ib}=x+iy$, Then Possible Value of $\sqrt{a-ib}=?$
	Option A	$\sqrt{x^2+y^2}$
	Option B	x^2+y^2
	Option C	$x-iy$
	Option D	$\sqrt{x^2-y^2}$
3.		If $z=-1+i$, Then which statement is correct ?
	Option A	$\|z\|=\sqrt{2}$ and $arg(z)=\frac{-\pi}{4}$
	Option B	$\|z\|=\sqrt{2}$ and $arg(z)=\frac{5\pi}{4}$
	Option C	$\|z\|=\sqrt{2}$ and $arg(z)=\frac{\pi}{4}$
	Option D	$\|z\|=\sqrt{2}$ and $arg(z)=\frac{3\pi}{4}$

4.		If $z = cos\theta + i\, sin\theta$, Then which statement is false ?
	Option A	$z^n - \frac{1}{z^n} = 2i\, sin(n\theta)$
	Option B	$z^n + \frac{1}{z^n} = 2\cos(n\theta)$
	Option C	$z^n - \bar{z}^n = 2\, sin(n\theta)$
	Option D	$iz^n - i\bar{z}^n = -2\, sin(n\theta)$
5.		If $z = \frac{1}{\sqrt{2}} + i\frac{1}{\sqrt{2}}$, and $\bar{z}$ is the conjugate of z, then $(z)^{10} + (\bar{z})^{10} =$
	Option A	0
	Option B	$2i$
	Option C	$-2i$
	Option D	1
6.		If $z = \frac{1}{\sqrt{2}} + i\frac{1}{2}$, Then which statement is correct ?
	Option A	$\|z\| = 1$ and $arg(z) = \tan^{-1}(1)$
	Option B	$\|z\| = 1$ and $arg(z) = \tan^{-1}\left(\frac{1}{\sqrt{2}}\right)$
	Option C	$\|z\| = \frac{\sqrt{3}}{2}$ and $arg(z) = \tan^{-1}(\sqrt{3})$
	Option D	$\|z\| = \frac{\sqrt{3}}{2}$ and $arg(z) = \tan^{-1}\left(\frac{1}{\sqrt{2}}\right)$
. 7.		The Polar form of z= $(i^{25})^3$ is
	Option A	$z = cos\frac{\pi}{2} + i\, sin\frac{\pi}{2}$
	Option B	$z = cos\frac{\pi}{2} - i\, sin\frac{\pi}{2}$

	Option C	$z = \cos(\pi) + i\sin(\pi)$
	Option D	$z = \cos(\pi) - i\sin(\pi)$
8.		If $i^2 = -1$, then $i + i^2 + i^3 + i^4 + i^5 + \cdots\cdots + i^{1000} = ?$
	Option A	i
	Option B	$-i$
	Option C	0
	Option D	1
9.		The polar form of complex number $z = x + iy$ is
	Option A	$z = r(\sec\theta + i\,\mathrm{cosec}\,\theta)$
	Option B	$z = r(\sin\theta + i\cos\theta)$
	Option C	$z = r(\cos\theta + i\sin\theta)$
	Option D	$z = r(\tan\theta + i\cot\theta)$
10.		The value of $(\cos\theta + i\sin\theta)^{100}$ is
	Option A	$\sin 100(\theta) + i\cos 100(\theta)$
	Option B	$\cos 100(\theta) + i\sin 100(\theta)$
	Option C	$\sin 100(\theta) - i\cos 100\,(\theta)$
	Option D	$\cos 100(\theta) - i\sin 100(\theta)$
11.		If $z = x + iy$, $where\ x < 0, y < 0$, Then the imaginary part of z is

	Option A	$\frac{z+\bar{z}}{2}$
	Option B	$\frac{z-\bar{z}}{2i}$
	Option C	$\frac{z+\bar{z}}{2i}$
	Option D	$\frac{z-\bar{z}}{2}$
12.		The value of $(1+i)^{100}+(1-i)^{100}=?$
	Option A	$(2)^{51}$
	Option B	$(-2)^{51}$
	Option C	$(-2)^{50}$
	Option D	$(2)^{50}$
13.		If $'n'$ is positive integer, Then value of $\left(\frac{1+7i}{(2-i)^2}\right)^{4n}=?$
	Option A	$(-4)^n$
	Option B	$(-2)^n$
	Option C	$(-1)^n$
	Option D	$(4)^n$
14.		The value of $(\sqrt{-2}\ )(\sqrt{-3}\ )$ is
	Option A	$\sqrt{6}$
	Option B	$i\sqrt{6}$
	Option C	$-\sqrt{6}$

	Option D	$-i\sqrt{6}$
15.		If $z = 1 + i$ and $\bar{z}$ is the conjugate of z, then which statement is false ?
	Option A	$z\ \bar{z} = \|\bar{z}\|^2$
	Option B	$\|\bar{z}\|^2 = \|z\|^2$
	Option C	$arg(z\ \bar{z}) = 0$
	Option D	$arg\left(\frac{z}{\bar{z}}\right) = 0$
16.		If $x + iy = \sqrt[3]{a + ib}$, then $\frac{a}{x} + \frac{b}{y} = ?$
	Option A	$4(x^2 - y^2)$
	Option B	$4(x^2 + y^2)$
	Option C	$-4(x^2 - y^2)$
	Option D	$-4(x^2 + y^2)$
17.		If $\alpha - i\beta = \frac{1}{a-ib}$, then $(\alpha^2 + \beta^2)(a^2 + b^2) = ?$
	Option A	0
	Option B	-1
	Option C	1
	Option D	$(a^2 - b^2)$
18.		The value of $\frac{i^{592}+i^{590}+i^{588}+i^{586}+i^{584}}{i^{582}+i^{580}+i^{578}+i^{576}+i^{574}} - 1 = ?$
	Option A	2

	Option B	0
	Option C	-1
	Option D	-2
19.		If $z = a + ib$, Lies in Third Quadrant, then $\frac{\bar{z}}{z}$ Also Lies in Third Quadrant If
	Option A	$a > b > 0$
	Option B	$b < a < 0$
	Option C	$a < b < 0$
	Option D	$b > a > 0$
20		If Z lies on |Z|=1 then $\frac{2}{z}$ lies on
	Option A	Circle
	Option B	An ellipse
	Option C	A parabola
	Option D	A straight line
21		The value of $\sum_{n=1}^{10}\left(sin\left(\frac{2\pi n}{11}\right) - icos\left(\frac{2\pi n}{11}\right)\right)$ is
	Option A	-1
	Option B	0
	Option C	-i

	Option D	I
22		A root of $x^3 - 8x^2 + px + q = 0$ is $3 - \sqrt{3}$ where p and q are real numbers then the other root could be
	Option A	9
	Option B	6
	Option C	2
	Option D	12
23		If ω is an imaginary cube root of unity then $(1 + \omega - \omega^2)^7$ is equal to
	Option A	128 ω
	Option B	128 ω^2
	Option C	-128 ω
	Option D	-128 ω^2
24		If ω is cube root of unity then the value of $\begin{vmatrix} 1 & \omega & 2\omega^2 \\ 2 & 2\omega^2 & 4\omega^3 \\ 3 & 3\omega^3 & 6\omega^4 \end{vmatrix}$
	Option A	1
	Option B	0
	Option C	-1
	Option D	4

25		The number of roots of the expression $x^6 - i = 0$ is
	Option A	7
	Option B	6
	Option C	8
	Option D	9
26		Which of the following is true?
	Option A	$\sin^5\theta = \frac{1}{16}(\sin 5\theta - 5\sin 3\theta + 10\sin\theta)$
	Option B	$\sin^5\theta = \frac{1}{16}(\sin 5\theta - 5\sin 3\theta + 10\sin 7\theta)$
	Option C	$\sin^5\theta = \frac{1}{16}(\sin 5\theta - 5\sin 3\theta - 10\sin 9\theta)$
	Option D	$\sin^5\theta = \frac{1}{16}(\sin 5\theta + 5\sin 3\theta + 10\sin 11\theta)$
27		Which of the following is true?
	Option A	Cos(iz)=icos(z)
	Option B	Cos(iz)=cos(z)
	Option C	Cos(iz)=cosh(z)
	Option D	Cos(iz)=isin(z)
28		Which of the following is true ?
	Option A	sin(iz)=sin(z)
	Option B	sin(iz)=-sin(z)

	Option C	sin(iz)=icos(z)
	Option D	Sin(iz)=isinh(z)
29		The formula for sinh3z is given by
	Option A	sinhz=3sinhz+4sinh^{3}z
	Option B	sinhz=3sinhz-4sinh^{3}z
	Option C	sinhz=3coshz+4sinh^{3}z
	Option D	sinhz=3sinhz+4cosh^{3}z
30		Which of the following is false ?
	Option A	$\sinh^{-1} x = \log\left(x + \sqrt{x^2+1}\right)$
	Option B	$\cosh^{-1} x = \log\left(x + \sqrt{x^2-1}\right)$
	Option C	$\tanh^{-1} x = \frac{1}{2}\log\left(\frac{1+x}{1-x}\right)$
	Option D	$\coth^{-1} x = \frac{1}{4}\log\left(\frac{1-x}{1+x}\right)$
31		The value of $tanh(ln\sqrt{3})$ is
	Option A	1
	Option B	2
	Option C	0.8
	Option D	0.5

32		The real part of cos(x+iy) is
	Option A	cosx sinhy
	Option B	cosx coshy
	Option C	cosxcosy
	Option D	cosx tany
33		The value of sinh(∞) is
	Option A	0
	Option B	-∞
	Option C	∞
	Option D	1
34		The value of $log_e i$
	Option A	1
	Option B	0
	Option C	$\frac{i\pi}{2}$
	Option D	$\frac{-i\pi}{2}$
35		The value of $log_e(i^{-i})$
	Option A	$\frac{i\pi}{2}$
	Option B	$\frac{-i\pi}{2}$

	Option C	$\frac{\pi}{2}$
	Option D	$\frac{-\pi}{2}$
36		If $2+i\sqrt{3}$ is a root of the quadratic equation $x^2+ax+b=0$ where a,b are real numbers then the value of a, b are
	Option A	4,7
	Option B	4,-7
	Option C	-4,-7
	Option D	-4,7
37		If tanhx=0.5 then cosh(2x) is
	Option A	2/3
	Option B	4/3
	Option C	1
	Option D	1/3
38		If x is complex numbers such that $x^2+x+1=0$ then x^{31} is equal to
	Option A	x
	Option B	1
	Option C	0
	Option D	x^2

39		$Cosh^2x + sinh^2x$
	Option A	Cosh(2x)
	Option B	1
	Option C	Sinh(2x)
	Option D	tanh(2x)
40		The derivative of cosh(3x) with respect to x is
	Option A	cosh(3x)
	Option B	-3sinh(3x)
	Option C	3sinh(3x)
	Option D	coth(3x)
41		What is the exact value of cosh(ln2)
	Option A	¾
	Option B	2/5
	Option C	7/3
	Option D	5/4
42		Find the value of log(-6)
	Option A	Log6+iπ
	Option B	Log6+i4π
	Option C	Log6+i3π

	Option D	Log6+i2π
43		Representing i^i in terms of e we get
	Option A	$e^{\frac{i\pi}{2}}$
	Option B	$e^{\frac{\pi}{2}}$
	Option C	$e^{-\frac{\pi}{2}}$
	Option D	$e^{\frac{-i\pi}{2}}$
44		If x+iy=csin(u+iv) then u=constant represents family of
	Option A	Confocal ellipse
	Option B	Confocal circles
	Option C	Confocal hyperbolas
	Option D	Confocal parabolas
45		The triangle formed by the points $i, \frac{1+i}{\sqrt{2}}, 1$ as vertices in the Argand's diagram is
	Option A	Scalene
	Option B	Equilateral
	Option C	Isosceles
	Option D	Right angled
46		The smallest positive integer n for which $(1+i)^{2n} = (1-i)^{2n}$ is

	Option A	4
	Option B	8
	Option C	2
	Option D	12
47		If sinhx=4/3 then coshx is
	Option A	7/3
	Option B	5/3
	Option C	8/3
	Option D	11/3
48		If $\left(\sqrt{3}+i\right)^{100} = 2^{99}(a+ib)$ then a^2+b^2 is
	Option A	1
	Option B	2
	Option C	3
	Option D	4
49		The number of common roots of $x^5-1=0$ and $x^4+x^3+x^2+x+1=0$ are
	Option A	4
	Option B	3
	Option C	2
	Option D	5

50		The continued product of $i^{2/3}$ is
	Option A	2i
	Option B	0
	Option C	1
	Option D	-1