UNIT-5 COMPLEX INTEGRATION

1.	An Analytic function $f(z) = u(x,y) + iv(x,y)$ then $u(x,y)$& $v(x,y)$must satisfy the which of the following
	(a) $u_x = v_y$ & $u_y = -v_x$ (b) $u_x = v_y$ & $u_y = v_x$ (c) $u_x = u_y$ & $v_y = v_x$ (d) $u_x = -u_y$ & $v_y = -v_x$
2.	Solutions of Laplace's equation having continuous 2nd order partial derivatives are called
	(a) Bi harmonic functions (b) harmonic functions (c) Conjugate harmonic functions (d) None
3.	Let $f_1(z) = z^2$ & $f_2(z) = \bar{z}$ be two complex variable functions.
	(a) Both are analytic (b) only $f_1(z)$ is analytic (c) only $f_2(z)$ is analytic (d) none
4.	Let $z = x + iy$ then $\overline{\cos z}$
	(a) $\cos z$ (b) $\cos \bar{z}$ (c) $\sin z$ (d) $\sin \bar{z}$
5.	The value of the integral $\int_c \frac{z\,dz}{z^2+1}$, $C: \lvert z + i \rvert = \frac{1}{2}$ is
	(a) 0 (b) πi (c) $-\pi i$ (d) $2\pi i$
6.	For $f(z) = \frac{1}{\sin z - \cos z}$ $z = \frac{\pi}{4}$ is
	(a) a pole of order 1 (b) a pole of order 2 (c) an isolated essential singularity (d) a non- isolated essential singularity
7.	The value of $\int_c \frac{e^z\,dz}{(z-3)^2}$, $C: \lvert z \rvert = 2$ is
	(a) 0 (b) $2\pi i$ (c) πi (d) $-2\pi i$
8.	A point at which a function $f(z)$ ceases to be analytic is called
	(a) Zero (b) singularity (c) pole (d) limit point
9.	$w = \frac{1}{z}$ is analytic everywhere except at the point
	(a) $z = \infty$ (b) $z = 0$ (c) $z = -1$ (d) $z = -2$
10	If $f(z) = (x^2 + ay^2) + ibxy$ is analytic function then
	(a) $a = -1$ & $b = -1$ (b) $a = -1$ & $b = 2$ (c) $a = 1$ & $b = 2$ (d) $a = 1$ & $b = -2$
11	Real part of $w = e^{z^2}$
	(a) $u = e^{x^2-y^2} \cos 2xy$ (b) $u = e^{x^2} \cos 2xy$ (c) $u = e^{x^2-y^2} \sin 2xy$ (d) None
12	Imaginary part of $\sin \bar{z}$ is
	(a) $\sin x \sinh y$ (b) $\cos x \sinh y$ (c) $-\cos x \sinh y$ (d) None
13	The value of $\int_c \frac{dz}{z+2}$ where C is the circle $\lvert z \rvert = 1$ is
	(a) $2\pi i$ (b) $-2\pi i$ (c) 0 (d) πi
14.	Poles of $\frac{z}{z^2+1}$ are given by
	(a) $z = -1$ (b) $z = i$ (c) $z = \pm 1$ (d) $z = \pm i$

15	At $z = \infty$, $\frac{1-e^z}{1+e^z}$ has
	(a) Simple pole singularity (b) a double pole (c) an isolated (d) a non-isolated essential singularity
16	A function whose only singularities in the entire complex plane are poles is called
	(a) Analytic function (b) regular function (c) homomorphic function (d) meromorphic function

FILL IN THE BLANKS:

1.	$w = z^3 - 4z + 1$ is analytic --------------------------
2.	$w = \frac{z+2}{z(z^2+1)}$ is not analytic at--------------------------------
3.	$u(x, y)$ is said be harmonic if ---
4.	Imaginary part of e^{iz} ---------------------------------
5.	Residue of $\frac{1}{(z^2+a^2)^2}$ at $z = ia$ is _______________.
6.	Taylor's series expansion of $\frac{1}{z-2}$ in the region $\|z\| < 1$ is _________________ .
7.	The value of $\int_0^{2+i} (\bar{z})^2\, dz$ along the line $x = 2y$ is __________________ .
8.	Residues of $z = 3$ of $f(z) = \frac{z+1}{z^2(z+3)}$ is __________________________
9.	Analytic function of an analytic function is --------------------------------
10.	$f(z) = \bar{z}$ is not -------------------------------- any where.
11.	$\lim\limits_{z \to 1} \frac{z^2-1}{z-1} =$ --
12	If $f(z) = z\bar{z}$ then $u =$--------------------, $v =$ ----------------------
13	Residue of $\frac{1}{z^2(z-i)}$ at $z = i$ is _________________.
14	Laurent's series of the function $f(z) = \frac{1}{z^2(1-z)}$ about $z = 0$ is _______________ .
15	The value of $\int_0^{2+i} z^2\, dz$ along the line $x = 2y$ is __________________ .
16.	Residue at $z = 1$ of $f(z) = \frac{z+1}{(z-1)(z-2)(z-3)}$ is __________________________ .