Assignment 2

Subject: Complex Variables and Transforms (BSI- 362)

Maximum Marks=100 **CLO 1/PLO 1 [Knowledge]**

1. **Determine** the set of points S where each function is continuous

$$f(z)=\frac{z-1}{z^7+z^4+z^3+1}$$

2. **Determine** where $f(z)=\frac{1+z}{1-z}$ is non analytic.

3. **Find** Re f and Im f . Are following functions analytic? Riemann Equations)

a) $f(z)=(1+2i)z^5-(-1-i)z^4+4iz+(-1+4i)$

b) $w=\frac{1}{(z-a)^n},(h\text{int}s.\quad x-a=r\cos\theta, y=r\sin\theta)$

4. **Determine** $a,b,$ and c such that given functions are harmonic and find a harmonic conjugate.

a) $u=ax^3+bxy$

b) $u(x,y)=ax^3+by^3$

c) $u=\sin x\cosh cy$

5. **Find** all solutions

a) $e^z=1$.

b) $e^z=4+3i$

6. **Find** the principal value of the given expression

c) $(1+i)^{-1+i}$.

d) $(1+3i)^{i}$