**Q.1.** Determine whether the following functions are analytic and if so find their derivatives

**(i)** **(ii)**

Q.2**.** Show that the functions **(i)** **(ii)** are not analytic

Q.3**.** Find the constants a, b, c, d, e if

is analytic

**Q.4.** If is analytic in R show that

Q.5 Construct an analytic function whose real part is

Q.6 Find an analytic function whose imaginary part is

**Q.7.** Show that there does not exist an analytic function whose real part is

Q.8**.** Show that the following functions are harmonic and find the corresponding analytic function And the harmonic conjugate.

**(i)** **(ii)**

Q.9 Find the orthogonally trajectories of the family of the curves