(b) Define boundary layer thickness, displacement thickness, momentum thickness.

Q.4 (a) Explain boundary layer separation phenomena

(b) Find the displacement thickness, momentum thickness & energy thickness for the velocity distribution in the boundary layer.

$u/U = 2(y/\delta) - (y/\delta)^2$

Q.5 (a) Explain various energy losses in pipes.

(b) Establish an expression for stagnation pressure

Q.6 (a) Explain N-S equation & its application.

(b) What do you understand by total drag on a body, resultant force on a body, coefficient of drag

Q.7 (a) State the Bernoulli's theorem for compressible flow in differential form.

(b) Prove the velocity of sound wave in a compressible fluid $C=\sqrt{K/\rho}$

Q.8 (a) Differentiate between isentropic and adiabatic process.

(b) What do you mean by sub-sonic, sonic & supersonic flows?

Enroll No………………..

ME-103

M.Tech.(Thermal)–I Sem (Reg./ Ex.)

Examination, March.-2021

Advanced Fluid Mechanics

Time: Three Hours

Maximum Marks:70

Note : Attempt any five questions. (Each question carries equal marks)

Q.1 (a) Explain the concept of continuum.

(b) Write short note on

 (i) Specific Weight

 (ii) Newton's laws of viscosity

Q.2 (a) State & discuss Reynolds transportation theorem.

(b) Calculate dynamic viscosity of oil, which is used for lubrication between square plate of size 0.8m $\times$ 0.8m and an inclined plane with angle of inclination 30^0, the weight of square plate is 300 N & it slide down the inclined lane with a uniform velocity of 0.3 m/s the thickness of oil film is 1.5 mm.

Q.3 (a) Derive the expression for velocity variation for a laminar incompressible flow in a circular pipe.