

D 51480

(Pages 2)

Name R. Raghav Murali
Reg. No. JYAFEEE 038



**THIRD SEMESTER B.TECH. (ENGINEERING) DEGREE
EXAMINATION, DECEMBER 2008**

EE 04 304—MECHANICAL ENGINEERING—II

(2004 Admissions.)

Time : Three Hours

Maximum : 100 Marks

Answer all questions.

Draw sketches wherever necessary.

1. (a) State and explain Newton's Law of viscosity.
- (b) Describe three types of equilibrium possible for a floating body. What is the condition for stability?
- (c) Describe three models of similitude.
- (d) Differentiate between impulse and reaction turbines.
- (e) State the assumptions considered for deriving continuity equation.
- (f) With a sketch explain the velocity profile of water flowing through a circular pipe.
- (g) Explain the working principle of a roto dynamic pump.
- (h) Compare belt, rope and chain drives.

(8 × 5 = 40 marks)

2. (a) (i) State Pascal's law. Explain atmospheric pressure, gauge pressure and vacuum with respect to a datum reference.
- (ii) 4.2m³ of oil weighs 39 kN. Calculate the specific weight, specific volume, mass density and specific gravity of the oil.

Or

- (b) (i) Determine the total force and position of the centre of pressure for a circular plate of 3.5m diameter immersed vertically in water with its top surface (edge) 2.5 m below the water surface.
 - (ii) What is metacentre ? Show the position of metacentre for stability for a balloon floats in air.
3. (a) (i) Derive the expression for theoretical discharge for a venturimeter through the application of energy equation.
 - (ii) Water flows through a pipe, in which size changes from 100 mm diameter at section 1 to 200 mm diameter at section 2. A pressure gauge fitted at section 1 shows 200 kN/m² and a gauge at section 2 shows 150 kN/m² respectively. If the discharge is 2m³/sec, determine the direction of flow and energy loss.

Or

Turn over