Branch: Electrical Engineering   Sem.:- III
Subject with Subject Code:- Fluid Mechanics and Thermal Engineering(BTEEC303) Marks: 60
Date:- 14/12/2019   Time:- 3 Hr.

Instructions to the Students
1. Each question carries 12 marks.
2. Attempt **any five** questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly

(Marks)

Q.1. a) Define viscosity and deduce the units of viscosity. Explain the effect of temperature on viscosity for liquids and gases. (06)

b) The space between two square flat parallel plates is filled with oil. Each side of the plate is 60cm. The thickness of the oil film is 12.5mm. The upper plate, which moves at 2.5 m/sec requires a force of 98.1 N to maintain the speed. Determine: i) the dynamic viscosity of the oil in poise, and ii) the kinematic viscosity of the oil in stokes if the specific gravity of oil is 0.95. (06)

Q.2. a) Derive Darcy-Weisbach equation. (06)

b) A main pipe divides into two parallel pipes which again forms one pipe. The length and diameter for the first parallel pipe are 2000m and 1m respectively, while the length and diameter of second parallel pipe are 2000m and 0.8m. Find the rate of flow in each parallel pipe, if total flow in the main is 3 m³/s. The coefficient of friction for each parallel pipe is same and equal to 0.005. (06)

Q.3. a) Explain with help of suitable sketches, the working of two stroke cycle petrol engine. (06)

b) Explain construction and working of closed cycle gas turbine. (06)

Q.4. a) Explain construction and working of multistage air compressor (06)

b) What is the difference between rotary and reciprocating compressor? Describe with neat sketch vane blower compressor. (06)

Q.5. a) Explain working of vapour compression refrigeration system.

b) State the properties of good refrigerant. What are the normal refrigerants used. (06)

Q.6. a) Define specific humidity, relative humidity and due point temperature. Draw psychrometric chart. (06)

b) Explain the following psychrometric processes.

    i) Sensible cooling ii) Sensible heating iii) Humidification and Dehumidification (06)