Roll No……..….. **Total No. of Printed Pages: 1**
Total No. of Questions: [09]

B. Tech (EE) (Semester – 8th)
THERMAL AND FLUID ENGINEERING
Subject Code: BMECO1002
Paper ID: [18OE111502]

Time: 03 Hours **Maximum Marks: 60**

Instruction for candidates:

1. Section A is compulsory. It consists of 10 parts of two marks each.
2. Section B consist of 5 questions of 5 marks each. The student has to attempt any 4 questions out of it.
3. Section C consist of 3 questions of 10 marks each. The student has to attempt any 2 questions.

Section – A **(2 marks each)**

Q1. Attempt the following:

a. Define the term viscosity.
b. State the Pascal's Law?
c. Differentiate between Newtonian Fluid and Non-Newtonian Fluid.
d. Write the few parts of turbo machines.
e. Discuss briefly the term Boiler efficiency.
f. What is the function of Superheater?
g. State the Zeroth Law of thermodynamics.
h. Write the various industrial applications of compressed air.
i. What do you mean by Refrigerant?
j. Classify the I.C engines.

Section – B **(5 marks each)**

Q2. Explain the terms: (a) Surface Tension (b) Cavitation (c) Adhesion.
Q3. Describe with a neat diagram, construction and working of Lancashire boiler.
Q4. Discuss the working of a two stroke cycle petrol engine with the help of a neat sketch.
Q5. Differentiate between centrifugal compressor and axial flow compressor.
Q6. The diameter of a pipe at section 1 and 2 are 10 cm and 15 cm respectively. Find the discharge through the pipe if the velocity of water flowing through the pipe at section 1 is 5 m/s. Determine the velocity at section 2.

Section – C **(10 marks each)**

Q7. Distinguish between manometers and mechanical gauges? What are the different types of mechanical pressure gauges?
Q8. Discuss the cooling requirement of an I.C engine. Describe the different methods of cooling and give specific examples where each method is employed.
Q9. In a Bell-Coleman refrigerating plant air is drawn into cylinder of compressor at atmospheric pressure of 1 bar and temperature -7° C and it is compressed adiabatically to 5.5 bar at which pressure it is cooled to 18° C. It is then expanded in an expansion cylinder to atmospheric pressure and discharged into the refrigerating chamber. Find the coefficient of performance of the plant if (a) the expansion is adiabatic, (b) the expansion follows the low $pv^{1.25}$ =constant.