CBCS Scheme

USN | | | | | | | | | | |

15MN42

# Fourth Semester B.E. Degree Examination, June/July 2018
## Thermodynamics and Fluid Mechanics

Time: 3 hrs. Max. Marks: 80

**Note:** ***Answer FIVE full questions, choosing one full question from each module.***





### Module-1

1 a. Define Thermodynamic system and give classification of Thermodynamic system. **(06 Marks)**
b. Explain Intensive and Extensive properties, with an example. **(06 Marks)**
c. Define Zeroth law of thermodynamics. **(04 Marks)**

**OR**

2 a. Define Work and Heat. **(04 Marks)**
b. Write the classification of Energy. **(06 Marks)**
c. Give difference between Heat and Work. **(06 Marks)**

### Module-2

3 a. Give Statements and explain I and II$^{nd}$ laws of thermodynamics. **(10 Marks)**
b. An inventor claims to have developed a work producing cycle that receives 1000kJ of heat from a heat source and rejects 300kJ of heat while producing a new work of 700kJ. How do you evaluate his claim? **(06 Marks)**

**OR**

4 a. With neat sketch, explain the working of a single stage air compressor. **(06 Marks)**
b. Derive an expression for work done in a single stage compressor without clearance volume. **(10 Marks)**

### Module-3

5 a. List and explain the various properties of fluids. **(08 Marks)**
b. With sketch, explain the various types of fluid. **(08 Marks)**

**OR**

6 a. With sketch, explain the fluid flow measurement using venturimeter. **(08 Marks)**
b. With sketch, explain the working of Orifice meter. **(08 Marks)**

### Module-4

7 a. With neat sketch, explain working of Bourdon's pressure gauge. **(10 Marks)**
b. Explain the various types of Manometers. **(06 Marks)**

**OR**

8 a. Define Buoyancy. **(04 Marks)**
b. Explain about Metacenter and Metacentric Height. **(08 Marks)**
c. Explain the conditions of equilibrium of floating and submerged bodies. **(04 Marks)**

### Module-5

9 a. Write Equations of Motions. **(06 Marks)**
b. Derive Bernoulli's equation from first principle. **(06 Marks)**
c. Give limitations of Bernoulli's equation. **(04 Marks)**

**OR**

10 a. Derive Euler's equation from fist principle and write the assumptions made. **(08 Marks)**
b. Explain Hydraulic gradient line. **(04 Marks)**
c. Write the limitations of Euler's equation. **(04 Marks)**

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