(Pages : 2) **A – 6616**

Reg. No. : .....

Name : .....

Combined First and Second Semester B.Tech. Degree Examination, December 2016
(2013 Scheme)
13.107 : Basic Mechanical Engineering (ACEFRT)

Time: 3 Hours Max. Marks: 100

PART – A

Answer **all** questions. **Each** question carries **2** marks :

1. What are the main causes of irreversibility ?
2. Write the mathematical expression for first law of thermodynamics for a cyclic process and non-cyclic process.
3. Explain the effect of temperature in viscosity of fluids.
4. Sketch PV and TS diagram of an otto cycle.
5. What are the main advantages of MPFI over an ordinary engine with carburetor ?
6. What is meant by priming in centrifugal pumps ?
7. Which turbine is used in Idukki, Moolamattam power station ? Why ?
8. What is GWP and ODP ?
9. What are the different types of gear trains ?
10. Explain the method of thread cutting. **(2×10=20 Marks)**

PART – B

Answer **any one full** question from **each** Module. **Each** question carries **20** marks :

Module – I

11. a) State and explain 2nd law of thermodynamics and show that the two statements are equivalent. **15**

    b) Can you use a refrigerator plant as a heat pump in winter ? Explain. **5**

OR

12. a) Derive Bernoulli's equation and state the assumptions. **15**

b) Explain the variation of specific gravity of water with temperature. **5**

Module – II

13. a) Derive an expression for air standard efficiency of otto cycle. **10**

b) Explain the working of a two stroke petrol engine. **10**

OR

14. a) Explain with a neat sketch, the working of a Cochran boiler. **12**

b) Compare two stroke and four stroke engine. **8**

Module – III

15. a) Explain with a neat sketch, the working of a Pelton wheel. **12**

b) Compare open cycle and closed cycle gas turbines. **8**

OR

16. a) Explain the working of a simple vapour compression refrigeration system with neat sketch. **10**

b) Sketch and explain the working of a hydro-electric power plant. **10**

Module – IV

17. a) A shaft runs at 80 rpm and drives another shaft at 150 rpm through belt drive. The diameter of the driving pulley is 600 mm. Determine the diameter of the driven pulley in the following cases :

i) Neglecting belt thickness

ii) Taking belt thickness as 5 mm

iii) Assuming for case (ii) a total slip of 4%. **12**

b) Explain oxyacetylene gas welding with a neat sketch. **8**

OR

18. a) Explain the principle, application and advantages of CNC machines. **15**

b) What are the advantages and disadvantages of EDM ? **5**
