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Reg. No. :

Name :

Combined First and Second Semester B.Tech.
Degree Examination, May 2015
(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. State Zeroth law of Thermodynamics.
2. Sketch P.V. and T.S. diagram of Otto cycle.
3. Classify the following properties as intensive and extensive
 - a) Energy
 - b) Pressure
 - c) Volume and
 - d) Specific enthalpy
4. Differentiate steady flow and uniform flow.
5. What are the advantages of MPFI system ?
6. What is mean by a high pressure boiler ? Give one example.
7. Give the basic classification of hydraulic turbines with examples.
8. What is Priming ?
9. Differentiate sand casting and die casting.
10. What is meant by an epicyclic gear train ?



(10x2=20 Marks)

PART – B

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

Module – I

11. a) With a line sketch make a comparison of Heat engine, heat pump and refrigerator. 10
- b) Obtain an expression for the work done during an isothermal process. 5
- c) What do you mean by flow work ? 5

OR

P.T.O.



12. a) Derive Bernoulli's equation and state its assumptions. 12
- b) A plate 0.0242 mm distant from a fixed plate moves at 0.61 m/s and requires a force of 0.20 kN/m² to maintain this speed. Determine the dynamic viscosity of the fluid between the plates. 8

Module – II

13. a) Determine the air standard efficiency of a Diesel engine working on Diesel cycle having a cylinder with bore 250 mm, stroke 375 mm, a clearance volume of 1500 cm³. The fuel is cut-off at 5% of the stroke. Assume $r = 1.4$ for air. 10
- b) With neat sketches explain the working of a Two Stroke Petrol Engine. 10

OR

14. a) Explain with a neat sketch, the Battery Ignition system used in petrol engine. 10
- b) Explain the Fluidized Bed Combustion (FBC) used in boilers with a neat diagram. 10

Module – III

15. a) Compare Open Cycle and closed cycle Gas Turbines. 10
- b) With neat sketch explain the working of a Reciprocating pump. 10

OR

16. a) With a simple lay out explain the working of Thermal Power plant. 10
- b) Draw and explain a window Air Conditioning System. 10

Module – IV

17. a) Derive an expression for the ratio of belt tensions. 10
- b) Explain the different types of Gear trains. 10

OR

18. a) What are the advantages of CNC Machines ? 5
- b) Write short note on rolling process. 5
- c) With a neat sketch explain the Electro Chemical Machining. 10
