(Pages : 2) **A – 2113**

Reg. No. : .....

Name : .....

Combined First and Second Semester B.Tech. Degree Examination, April 2016
(2008 Scheme)
08-107 : BASIC MECHANICAL ENGINEERING

Time : 3 Hours Max. Marks : 100

Instruction : *Answer **all** questions from Part **I** and **two** questions from **each** Module of Part **II**.*

PART – I **(4×10=40 Marks)**

1. Explain the first law of thermodynamics applied to an open system.
2. In a single P-V diagram show isobaric, isochoric, isothermal and isentropic processes. Write the equation of each process.
3. Can the entropy of the universe increase indefinitely ? Discuss the reason for your answer.
4. What is fluidised bed combustion ? Name the two types of fluidised bed combustors.
5. List the fields of applications of reciprocating and centrifugal compressors.
6. Draw the schematic diagram of a simple closed cycle gas turbine plant.
7. Distinguish between comfort and industrial airconditioning.
8. What is forging ? List any four typical components produced by forging.
9. What are the advantages of CNC machines ?
10. What is a gear train ? Why gear trains are used ?

P.T.O.

PART – II

Module – I

11. a) Draw the Otto cycle on P-V and T-S diagrams. **4**

    b) A gas engine working on the Otto cycle has a cylinder of diameter 200 mm and stroke 250 mm. The clearance volume is 1570 cc. Find the air standard efficiency. Assume C_p = 1.004 kJ/kg K and C_v = 0.717 kJ/kg K. **6**

12. Describe the fuel system of a diesel engine using a block diagram. **10**

13. Briefly describe :

    i) MPFI vehicle ii) Hybrid vehicles **10**

Module – II

14. Describe the working of a reciprocating pump with the help of simple sketch. **10**

15. i) What are the advantages of hydro electric power plant ? **4**

    ii) Draw a simple schematic diagram of the arrangement of main components of a nuclear power plant. **6**

16. Explain the working of a steam turbine of the reaction type with the help of suitable diagrams. **10**

Module – III

17. a) Why gear drives are called positive drives, whereas belt and rope drives are not considered positive ? **4**

    b) An engine shaft running at 200 rpm is required to drive a generator at 300 rpm by means of a belt. The pulley on the driving shaft is 500 mm diameter. Determine the diameter of the generator pulley of the thickness of belt is 8 mm. Assume a ship of 4%. **6**

18. Write short notes on welding, soldering and brazing. **10**

19. Describe the electrochemical machining process. Mention some typical applications of ECM process. **10**