| BME-052 |

DIPLOMA IN MECHANICAL ENGINEERING (DME)

00859

Term-End Examination

December, 2010

BME-052 : BASICS OF THERMAL ENGINEERING

Time : 2 hours   *Maximum Marks : 70*

Note : *All questions are compulsory. Use of calculator is permitted.*

1. Answer any two of the following :   **2x7=14**

    (a) Explain the difference between an impulse turbine and a reaction turbine.

    (b) Describe in brief the 'Boiler Mountings'.

    (c) In a cyclic process, heat transfers are +14.7 kJ, -25.2 kJ, -3.56 kJ and +31.5 kJ. What is the net work for this cyclic process ?

2. Answer any two of the following :   **2x7=14**

    (a) What is 'Steam nozzle' ? Explain various types of nozzles.

    (b) Define a thermodynamic system. Differentiate between open system, closed system and an isolated system.

    (c) Describe the different operations of Rankine cycle. Derive also the expression for its efficiency.

3. Answer any two of the following : 2x7=14

(a) What is regeneration ? How is it accomplished in Rankine cycle ?

(b) Describe in brief a nuclear power plant with the help of a suitable diagram.

(c) Find the co-efficient of performance and heat transfer rate in the condenser of a refrigerator in kJ/hr which has a refrigeration capacity of 12000 kJ/hr, when power input is 0.75 kW.

4. Answer any two of the following : 2x7=14

(a) What do you understand by the terms 'Convective heat transfer co-efficient' , and 'overall heat transfer co-efficient ?

(b) What are the functions of air pre-heater, economiser and re-heater in a power plant?

(c) State and explain the 'Kelvin–Planck' statement of Second of law of Thermodynamics.

5. Answer any two of the following : 2x7=14

   (a) List the advantages and limitations of a tidal power plant.

   (b) Explain with the help a suitable diagram the constructional details and working of a geothermal power plant.

   (c) A heat engine receives heat at the rate of 1500 kJ/min and gives an output of 8.2 kW. Determine :

       (i) The thermal efficiency.

       (ii) The rate of heat rejection.

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