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First Semester B.E. Degree Examination, Dec. 07 / Jan. 08
Elements of Mechanical Engineering

Time: 3 hrs.

Max. Marks:100

Note : Answer any FIVE full questions.

- 1
 - a. Classify energy sources and explain briefly. (10 Marks)
 - b. Determine the amount of heat required to produce 4.4 kg of steam at a pressure of 6 bar and temperature of 250°C from water at 30°C. Take specific heat for superheated steam as 2.2 kJ/kg°K. (10 Marks)

- 2
 - a. Sketch and explain Lancashire boiler. (12 Marks)
 - b. List the various boiler mountings and accessories. (08 Marks)

- 3
 - a. Give the complete classification of turbines. (12 Marks)
 - b. Explain the working principle of Pelton wheel with a schematic diagram. (08 Marks)

- 4
 - a. Sketch and explain an Otto cycle. (08 Marks)
 - b. The results of a test conducted on a petrol engine are given below-
 Indicated power = 30 kW; Brake power = 26 kW;
 Engine speed = 1000 rpm; Fuel consumption = 0.35 kg/bphr; Calorific value = 43900 kJ/kg
 Calculate : i) the indicated thermal efficiency, ii) the brake thermal efficiency and
 iii) the mechanical efficiency. (12 Marks)

- 5
 - a. List the desirable properties of refrigerant. (06 Marks)
 - b. Sketch and explain vapour compression refrigerator with a schematic diagram. (08 Marks)
 - c. Explain briefly the taper turning operations carried on lathe. (06 Marks)

- 6
 - a. Distinguish between the following:
 - i) Boring and Drilling
 - ii) Slab milling and Slot milling.
 - iii) Counter sinking and Counter boring. (12 Marks)
 - b. Explain briefly the cylindrical grinding process. (08 Marks)

- 7
 - a. Explain briefly electric arc welding. (08 Marks)
 - b. Discuss the advantages of brazing over soldering. (06 Marks)
 - c. Sketch and explain the following:
 - i) Drop feed lubrication and
 - ii) Ball and roller bearing (06 Marks)

- 8
 - a. Derive an expression for ratio of tensions in belt drive. (06 Marks)
 - b. Sketch a spur gear and give the terminologies. (04 Marks)
 - c. Name different types of control systems. Discuss their merits and demerits. (10 Marks)
