

41417



13. a) i) Write a note on nuclear fuels. (5)
ii) Write the points to be considered for selecting sites for nuclear power plant. (8)
(OR)
- b) Explain the working of a pressurized water reactor with a schematic diagram. (13)
14. a) i) Explain briefly the essential features of hydroelectric power plant. (8)
ii) State the advantages of inward flow reaction turbine over outward flow reaction turbine. (5)
(OR)
- b) i) Explain the operation of a fixed dome type digester biogas plant. (6)
ii) Describe the working of hydrogen-oxygen fuel cell. (7)
15. a) i) What are the basic requirements of energy tariffs? (5)
ii) Explain the elements of operating expenditure of a power plant. (8)
(OR)
- b) Determine the thermal efficiency of a steam power plant and its coal bill per annum using the following data :
Maximum demand = 24000 kW, Load factor = 40%, Boiler efficiency = 90%
Turbine efficiency = 92 %, Coal consumption = 0.87 kg/Unit
Price of coal = Rs. 280 per tonne. (13)

PART - C

(1×15=15 Marks)

16. a) A 2-cylinder C.I. engine with a compression ratio 13:1 and cylinder dimensions of 200 mm × 250 mm works on two stroke cycle and consumes 14 kg/h of fuel while running at 300 rpm. The relative and mechanical efficiencies of engine are 65% and 76% respectively. The fuel injection is effected upto 5% of stroke. If the calorific value of the fuel used is given as 41800 kJ/kg, calculate the mean effective pressure developed. (15)
(OR)
- b) A four-stroke diesel engine has a piston diameter of 16.5 cm and a stroke of 27 cm. The compression ratio is 14.3, the cut-off a 4.23% of the stroke and the mean effective pressure 4.12 bar. The engine speed is 264 rpm and the fuel consumption is 1.076 kg of oil per hour, having a calorific value of 39150 kJ/kg. Calculate the relative efficiency of the engine. (15)