A24 - 6899

Reg.No..............................
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DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/ COMMERCIAL PRACTICE, APRIL - 2024

POWER PLANT ENGINEERING

[Maximum marks: 100]　　　　　　　　　　　　　　　　　　　[Time: 3 Hours]

[Note: Use of Steam Tables and Mollier Charts are permitted]

PART – A
Maximum marks: 10

I.　(Answer **all** the questions in one or two sentences. Each question carries **2** marks)

　　1.　State the requirements of a good fuel.

　　2.　What are the factors effecting the function of cooling tower?

　　3.　What are the fuels used in gas turbine?

　　4.　Name the moderator material used in nuclear reaction.

　　5.　What are the functions of steam condenser?　　　　　　　　　(5 x 2 = 10)

PART – B
Maximum marks: 30

II.　(Answer any **five** of the following questions. Each question carries **6** marks)

　　1.　Explain the difference between Impulse turbine and Reaction turbines.

　　2.　Explain Reheating in steam turbine.

　　3.　Explain Carnot cycle with simple line sketch.

　　4.　State the difference between Open cycle and Closed cycle gas turbine.

　　5.　Compare Gas turbine with Steam turbine.

　　6.　Explain Nuclear Fission, Fusion and Chain reaction.

　　7.　Explain Parabolic Concentrators.　　　　　　　　　　　　　(5 x 6= 30)

PART – C
Maximum marks: 60
(Answer **one full** question from each unit. Each full question carries **15** marks)

UNIT – I
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III.　(a)　Explain Junkers Gas Calorimeter to determine the calorific value of the fuel with

　　　　　figure.　　　　　　　　　　　　　　　　　　　　　　　　　(8)

　　(b)　What are the functions of boiler draught and explain induced draught in boiler

　　　　　with figure?　　　　　　　　　　　　　　　　　　　　　　(7)

OR

IV. (a) What is meant by compounding of steam turbine and also explain Pressure Compounding with figure. (8)

(b) Explain Octane number, Cetane number, HCV & LCV. (7)

UNIT - II

V. (a) Explain the working of Air pump with figure. (8)

(b) The following observations were made during the test on a steam condenser:

Barometric reading = 765mm of Hg, Condenser vacuum = 710 mm of Hg, Mean condenser temperature = 35^0C, Temperature of hot well = 28^0C, Condensate collected = 2000 kg/hr, Cooling water circulated = 60000 kg/hr, Temperature of cooling water at inlet = 10^0C, temperature of cooling water at outlet = 25^0C.

Determine:

    (i)   Vacuum corrected
    (ii)   Vacuum efficiency
    (iii)   Condenser efficiency (7)

OR

VI. (a) A steam power plant is supplied with dry saturated steam at a pressure of 12 bar and exhaust into a condenser at 0.1 bar. Calculate the Rankine efficiency. (8)

(b) What are the functions of Condenser? Explain Merits and De-merits of Jet condenser and Surface condenser. (7)

UNIT - III

VII. (a) Explain the working of Diesel Power plant. (8)

(b) Explain the working of ram jet engine. (7)

OR

VIII. (a) A constant pressure open cycle gas turbine plant works between temperature range of and 7000C and pressure ratio of 6. Find the mass of air circulating in the installation, If it develop 1100kW. Also find the heat supplied by heating chamber. (8)

(b) Explain the working principle of Rocket propulsion. (7)

UNIT – IV

IX. (a) Explain the working of Nuclear power plant. (8)
(b) Explain the working of Tidal power plant. (7)

OR

X. (a) Explain the principle parts of reactor. (8)
(b) Explain the working of wind mills. (7)