22441

24225

3 Hours / 70 Marks   Seat No.

Marks

1. **Attempt any FIVE of the following :**   **10**

a) List different types of thermodynamics processes for ideal gas.

b) Write equation for Isobaric process.

   i)   Change in enthalpy.

   ii)   Work done.

c) State any four properties of liquid fuel.

d) Define dryness fraction and degree of superheat.

e) State two advantages of multistage compression.

f) Define conventional and non conventional energy sources.

g) State two limitations of solar energy.

Marks

2. **Attempt any THREE of the following :** **12**

   a) Represent the carnot cycle on P–V and T–S diagram and write equation for air standard efficiency.

   b) Classify the steam boiler on the basis of –

      i) Content in the tubes

      ii) Circulation of water and steam.

      iii) According to boiler use.

      iv) According to axis of shell.

   c) Draw neat labelled sketch of "La-Mont Boiler"

   d) Differentiate between centrifugal and axial flow compressor.

3. **Attempt any THREE of the following :** **12**

   a) State the air standard efficiency of otto and diesel cycle.

   b) A coal has following composition by mass. C = 82%, H_z = 5%, S = 1.5%, O_Z = 2.4%, N_Z = 1% and remaining is ash. Find HCV and LCV of fuel.

   c) State two advantages and two factors governing the selection of cogeneration system.

   d) Two kg of gas at 50°C is heated at constant volume until pressure is doubled. Determine –

      i) Final temperature

      ii) Change in Internal Energy. Take CV = 0.70 KJ/KgK.

Marks

4. Attempt any <u>THREE</u> of the following :   **12**

   a) Draw dual cycle on P–V and T–S diagram and write the processes involved in it.

   b) Describe with neat sketch construction and working of Bomb calorimeter.

   c) Draw neat sketch and explain topping cycle system.

   d) Suggest energy conservation techniques to be used in automobile workshop.

   e) Compare reciprocating and rotary air compressor on the basis of –

      i) Maximum delivery pressure

      ii) Speed

      iii) Air supply

      iv) Size

5. Attempt any <u>TWO</u> of the following :   **12**

   a) Define calorific value of fuel. Differentiate between HCV and LCV of fuel.

   b) Describe the different phases of formation of steam.

   c) Draw neat labelled sketch of nuclear power plant.

6. Attempt any <u>TWO</u> of the following :   **12**

   a) Define following terms in relation to compressor –

      i) I.P.

      ii) Volumetric efficiency

      iii) Compressor efficiency

   b) Explain with neat sketch two pass down flow surface condenser. State function of condenser in steam power plant.

   c) Describe government policy (MNRE) for harnessing the potential power of renewable energy sources.

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