17559

14115

3 Hours / 100 Marks Seat No. | | | | | | | | |

Instructions – (1) All Questions are *Compulsory*.

(2) Illustrate your answers with neat sketches wherever necessary.

(3) Figures to the right indicate full marks.

(4) Assume suitable data, if necessary.

Marks

1. a) **Attempt any <u>THREE</u> of the following :** **12**

(i) State salient features of energy conservation act 2001.

(ii) What is benchmarking ?

(iii) Define calorific value and specific heat.

(iv) Give types of boilers.

b) **Attempt any <u>ONE</u> of the following :** **6**

(i) Give types and examples of fuel. How fuels are stored ?

(ii) Explain power factor. A three phase motor with rated voltage 440 V and power 1.85 kw draws current of 2.4 A. Calculate power factor.

Marks

2. Attempt any <u>FOUR</u> of the following : **16**

a) State necessity of energy audit.

b) Explain global primary energy reserves.

c) Compare conventional and Non-conventional energy sources.

d) Give Recommendation of ENCON.

e) What is LMTD ? Give its formula for cocurrent and counter current flow.

3. Attempt any <u>FOUR</u> of the following : **16**

a) What is biomass ? Give type of biomass.

b) Explain construction and working of fuel cell.

c) Explain performance assessment of pump.

d) Give types of heat exchanger by construction and flow.

e) Derive expression for power in wind.

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

(i) Explain energy conservation and state its importance.

(ii) Give benefits of energy audit.

(iii) List out energy saving opportunities in boiler.

(iv) State steps for performance assessment of Heat Exchanger.

b) Attempt any <u>ONE</u> of the following : **6**

(i) Define specific heat and latent heat steam at 100°C is condensed and cooled up to 40°C. Calculate heat given out in KJ. (Latent heat of condensation of steam = 540 kcal/kg sp. heat = 1 kcal/kg.k)

(ii) Give the construction and working of biogas plant.

Marks

5. Attempt any <u>TWO</u> of the following : **16**

a) What is simple payback period ? State its importance in energy conservation projects. An investment of Rs. 45,000 gives energy savings of Rs. 27,000/- per year yearly maintenance cost is Rs. 12,000/- Calculate its payback period.

b) What is NPSH - Why throttling should be avoided in pumping system.

c) Give features of perform achieve trad-PAT scheme.

6. Attempt any <u>TWO</u> of the following : **16**

a) Explain construction and working of parabolic and box type cooker.

b) Give types of biofuels and its uses.

c) Explain concept and block diagram of electricity generation from thermal power plant.

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