Scheme – G

Sample Test Paper-I

Course Name : Diploma in Chemical Engineering

Course Code : CH

Semester : Fifth **17559**

Subject Title : Energy Management

Marks : 25 **Time: 1 hour**

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.
5. Mobile phone is not allowed in examination hall.

Q1. Attempt any three **09 Marks**

a) List primary and secondary energy sources with example.
b) Why excess air is required for combustion?
c) List any six energy benchmarking parameters
d) Define calorific value and specific heat.

Q2. Attempt any two **08 Marks**

a) State salient features of EC act 2001.
b) Define power factor. Calculate power required to run motor. Rated voltage is 440 V, current 2 A and unity power factor.
c) Sate the importance of energy conservation.

Q3. Attempt any two **08 Marks**

a) An investment of Rs. 20000/- gives energy saving of Rs. 35000/- per year. Yearly maintenance cost is Rs. 8000/-. Calculate its payback period.
b) State eight energy benchmarking parameters
c) Explain walk through audit.

Scheme – G

Sample Test Paper-II

Course Name : Diploma in Chemical Engineering

Course Code : CH

Semester : Fifth **17559**

Subject Title : Energy Management

Marks : 25 **Time: 1 hour**

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.
5. Mobile phone is not allowed in examination hall.

Q1. Attempt any three **09 Marks**

a) List types of boilers. Define boiler evaporation ratio.

b) Write equation for LMTD (counter current flow).

c) What is throttling? Why it should be eliminated.

d) Explain working of box type solar cooker

Q2. Attempt any two **08 Marks**

a) Explain concept of fuel cell.

b) Differentiate between conventional and non-conventional energy sources.

c) Define range and approach.

Q3. Attempt any two **08 Marks**

a) Derive equation for power available in wind.

b) Explain gasification of biomass with example.

c) List energy conservation opportunities in pump

Scheme – G

Sample Question Paper

Course Name : Diploma in Chemical Engineering

Course Code : CH

Semester : Fifth **17559**

Subject Title : Energy Management

Marks : 100 **Time: 3 hours**

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.
5. Mobile phones are not allowed in the examination hall.

Q.1 A) Attempt any THREE of the following: **12 Marks**

a) Classify energy sources with suitable examples.

b) What is biomass? Why it is called as renewable energy?

c) Explain need of energy audit.

d) Explain concept of fuel cell.

Q.1 B) Attempt any ONE of the following: **06 Marks**

a) State three modes of heat transfer with example.

b) Explain power factor. A three phase motor with rated voltage 440 V and power 1.9 kW draws current of 2.6 A. Calculate power factor.

Q.2 Attempt any FOUR of the following: **16 Marks**

a) Explain any four ENCON recommendations.

b) State the salient features of EC act 2001.

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

d) List out any eight energy saving opportunities in cooling tower.

e) Explain energy conservation and state its importance.

Q.3 Attempt any FOUR of the following: **16 Marks**

a) List components of windmill with their uses.

b) State advantage and disadvantages of direct method for boiler efficiency calculation

c) Write structure of energy audit report.

d) Derive expression for power in wind.

e) State salient features of PAT scheme

Q.4 A) Attempt any THREE of the following: **12Marks**

a) List any four energy conservation measures in boiler.

b) Explain working of flat plate collector with neat sketch.

c) Explain three T's of combustion.

d) Differentiate between conventional and non conventional energy sources.

Q.4 B) Attempt any ONE of the following: **06 Marks**

a) Define specific heat and latent heat. Steam at $100^{o}C$ is condensed and cooled upto $50^{o}C$. Calculate heat given out in kJ . (Latent heat of condensation of steam = 540 Kcal/kg, Sp. Heat = 1 kcal/kg.K)

b) State eight energy bench making parameters.

Q.5 Attempt any TWO of the following: **16 Marks**

a) Explain efficiency calculation of boiler by direct method to evaluate its performance.

b) What is simple payback period? State its importance in energy conservation projects. An investment of Rs. 20,000/- gives energy saving of Rs. 35000/- per year. Yearly maintenance cost is Rs. 8000/-. Calculate its payback period.

c) Why throttling should be avoided in pumping system. A pump consumes 8 KW power. If its impeller is trimmed by 10% of original diameter, calculate saving n power.

Q.6 Attempt any TWO of the following: **16 Marks**

a) Explain role of range and approach in cooling tower performance evaluation. How much maximum cooling is possible in cooling tower? State any four measures for energy conservation in cooling tower.

b) Explain construction and working of biogas plant.

c) List the steps to check performance assessment of heat exchanger.