CS/B.Tech(TT/APM)/SEM-8/TT-801/2012

2012

ENERGY SCIENCE

Time Allotted : 3 Hours *Full Marks* : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

(Objective Type Questions)

1. Answer the following in short : 10X1 = 10

a) Mention two advantages of non-conventional energy.

b) Define the term "Clean coal technology".

c) What do you know about "Surface mining" of coal ?

d) What is 'Geothermal energy' ?

e) What is "Power factor" ?

f) How does "Solar collector" work ?

g) Mention two disadvantages of Nuclear energy.

h) What do you know about "Tidal barrage" ?

i) Mention two natural and two industrial Greenhouse gases.

j) What is energy efficient motor ?

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. 3X5 = 15

2. Define wave energy. How is tidal energy utilized into electrical energy ? What are the methods used ?

3. What is PV cell ? How does it work ? Discuss in short about the use of PV cell.

4. What are the different forms of Renewable source of energy ? What is acid rain ? Explain in short about Global warming and what are the actions to be taken.

5. What do you know about Energy security ? What are the different forms of energy security ? What do you know about long and short term security ?

6. How is coal converted to electrical energy ? What do you know about Oil and environment ?

7. Define energy management. What is its objective ? Mention three methods which will assist to improve power factor.

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3X15 = 45

8. a) What is the different sources of geothermal energy ? Discuss about the mining of geothermal heat.

b) Mention about some of the geothermal plant in India and also mention which are the organizations working on Geothermal energy.

c) Discuss about the social and economic status of energy generation from geothermal heat. 7 + 5 + 3

9. a) What are the sources of Biomass ? What are the ways the biomass can be used ?

b) Explain the chemistry and process parameters in the generation of electricity. What do you know about upgrading of biogas ? Discuss about the hazardous aspect of biogasification. 7 + 8

10. a) What is the difference between "energy conservation" and "conservation of energy" ? What are the two ways by which energy can be conserved ?

b) What is thermal insulation ? Where is the mechanical insulation installed ? How many types of insulation are in use ? Mention their physical properties.

c) Mention some of the actions can be taken for energy conservation by control. 3 + 7 + 5

11. a) What is solar power ? How is solar power converted to electricity ? What do you know about concentrating solar power ?

b) What is the solar collector ? What are the limitations of solar energy ? 8 + 7

12. a) Define energy audit. What is the need for energy audit ?

b) What are the factors on which the type of energy audit to be performed is depend ? Classify energy audit and discuss about the preliminary energy audit methodology. 6 + 9

13. a) Give five production realization techniques relate to the energy conservation with its different mechanism and effects used in textile industry.

b) What are the steps to be taken for thermal energy conservation in wet process in textile industry ? Discuss two practical techniques of water conservation.

7 + 8