Fifth Semester B.E. Degree Examination, December 2011
Energy Engineering

Time: 3 hrs.   Max. Marks:100

Note: *Answer any FIVE full questions, selecting*
at least TWO questions from each part.

PART – A

1   a. Explain the traveling grate stoker, with a neat sketch.   **(06 Marks)**
    b. What is pulverized coal? Discuss the advantages and disadvantages of pulverized coal.
                                                                                 (06 Marks)
    c. Explain the pneumatic ash handling system, with a neat sketch.   **(08 Marks)**

2   a. Explain the Velox boiler, with a neat sketch.   **(08 Marks)**
    b. Explain with sketches, any two boiler accessories.   **(06 Marks)**
    c. A chimney is 28 m high and the temperature of hot gases inside it is 320°C. The temperature of outside air is 27°C. The furnace is supplied with 15 kg of air per kg of coal burnt. Calculate : i) Draught produced in mm of water   ii) Draught height in metres of hot gases.
                                                                                 (06 Marks)

3   a. Draw the layout of a diesel power plant.   **(06 Marks)**
    b. Explain different methods of starting the diesel engine.   **(06 Marks)**
    c. Why the cooling and cleaning of lubricating oil is necessary? Explain, with a sketch, the lubricating system used for a medium capacity diesel power plant.   **(08 Marks)**

4   a. Explain clearly storage, pondage and pumped storage hydro-electric power plants. **(06 Marks)**
    b. Explain the necessity of using the components like surge tank, gates and valves in hydel power stations.   **(06 Marks)**
    c. The following run-off data is obtained for ten months, at a particular site of a river:

Months	1	2	3	4	5	6	7	8	9	10
Discharges	200	100	20	20	260	180	40	280	60	120

Discharges are given in millions of cu-m per month. Explain the procedure to determine size of the reservoir and hence find its numerical value.   **(08 Marks)**

PART – B

5   a. Explain the principle of release of nuclear energy by fussion and fission reactions. **(06 Marks)**
    b. Explain the sodium-graphite nuclear reactor, with a neat sketch.   **(08 Marks)**
    c. Write short notes on radiation hazards and disposal of radioactive wastes. **(06 Marks)**

6   a. Explain the low temperature solar thermal power generation, with a neat sketch. **(08 Marks)**
    b. Explain the method of harnessing wind energy, using the horizontal axis wind machine, with a neat sketch.   **(06 Marks)**
    c. The incident beam of sunlight has a power density of 0.9 kW/m^2 in the direction of the beam. The angle of incidence θ is 60°. Calculate the power collected by the surface, having a total flat area of 100 m^2.   **(06 Marks)**

7   a. Explain the method of harnessing tidal energy using the double basin system. **(08 Marks)**
    b. Explain the ocean thermal energy conversion system, with a neat sketch.   **(08 Marks)**
    c. Write a note on scope of geothermal energy.   **(04 Marks)**

8   a. Differentiate biomass and biogas.   **(04 Marks)**
    b. Explain the principle of operation of a KVIC biogas digester, with a neat sketch. **(10 Marks)**
    c. Write a note on photosynthesis and anaerobic fermentation.   **(06 Marks)**

* * * * *