Code No: N0222/R07

Set No. 1

IV B.Tech I Semester Supplementary Examinations, Feb/Mar 2011
NON CONVENTIONAL SOURCES OF ENERGY
(Common to Electrical & Electronics Engineering and Mechanical
Engineering)

Time: 3 hours　　　　　　　　　　　　　　　　　　　　**Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks
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1. (a) What is the principle of solar photovoltaic power generation.
   (b) Explain about Pyrhelliometer and pyranometer.　　　　　　　　[10+6]

2. (a) Explain effects of various parameters on the performance of the collector.
   (b) Explain the following:
      i. Cosine loss
      ii. Difuse radiation.　　　　　　　　　　　　　　　　　[10+6]

3. (a) With the help of a neat sketch describe solar heating system using Solar collectors?
   (b) What are the merits and demerits of a solar PV system.　　　　[8+8]

4. (a) Derive the expression for power developed due to wind.
   (b) Write short notes on "Wind Electricity Economics".　　　　　[10+6]

5. (a) Explain the operation of CI engine working on biogas.
   (b) Explain the constructional details and working of KVIC digester.　[6+10]

6. (a) Explain Hydrothermal geo energy resources.
   (b) Explain the operation of vapour dominated geo-energy system with a neat schematic diagram.　　　　　　　　　　　　　　　　　　[8+8]

7. (a) Describe the phenomenon of tides. Why does tides occur? Classify them.
   (b) What are the advantages and disadvantages of ocean wave energy?　[8+8]

8. (a) Explain liquid metal system of MHD power generation with neat schematic.
   (b) Explain petrochemical regenerative fuel cell.　　　　　　　[10+6]

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Set No. 2

IV B.Tech I Semester Supplementary Examinations, Feb/Mar 2011
NON CONVENTIONAL SOURCES OF ENERGY
(Common to Electrical & Electronics Engineering and Mechanical
Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks
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1. (a) Explain the procedure to estimate the average solar radiation.

   (b) Define solar irradiance, solar constant. [10+6]

2. (a) Explain solar radiation on tilted surfaces.

   (b) How solar air collectors are classified? [10+6]

3. (a) What is a solar cell? Explain principle of operation.

   (b) Write short notes on solar distillation. [8+8]

4. (a) Write short notes on :

      i. Wind energy storage
      ii. Savonius rotor
      iii. Darrius rotor

   (b) Explain the major applications of wind power. [10+6]

5. (a) Draw the sketches of following models of biogas plants.

      i. Digester suitable for high water table
      ii. Absolute segregation of slurry
      iii. Two chamber rectangular digester with floating gas holder and water seal.

   (b) Mention any four advantages of anaerobic digestion. [12+4]

6. (a) Explain Hydrothermal geo energy resources.

   (b) Explain the operation of vapour dominated geo-energy system with a neat
   schematic diagram. [8+8]

7. (a) Draw the schematic diagram for Dolphin type wave power machine. Explain
   its operation.

   (b) What is the principle behind OTEC systems ? What is the criterion for the
   selection of site in OTEC systems. [10+6]

8. What is carnot cycle? Explain it with neat diagram. [16]

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Code No: N0222/R07

$$\boxed{\textbf{Set No. 3}}$$

IV B.Tech I Semester Supplementary Examinations, Feb/Mar 2011
NON CONVENTIONAL SOURCES OF ENERGY
(Common to Electrical & Electronics Engineering and Mechanical Engineering)

Time: 3 hours   **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks
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1. Derive the expression for monthly average of hourly global radiation on a tilted surface.   [16]

2. (a) Explain the principle of satellite microwave solar power plant.

   (b) What are the main advantages of flat plate solar collectors?   [8+8]

3. (a) Define collector efficiency and heat removal factor.

   (b) Mention solar pond applications.   [8+8]

4. (a) Explain Horizontal axis wind turbine main components and their functions.

   (b) Describe the generator control schemes.   [10+6]

5. (a) Explain any six factors affecting bio digestion of gas.

   (b) Explain the process of anaerobic digestion.   [8+8]

6. (a) Explain Hydrothermal geo energy resources.

   (b) Explain the operation of vapour dominated geo-energy system with a neat schematic diagram.   [8+8]

7. (a) What is the phenomenon of tides? Classify them and explain the reasons for them.

   (b) Explain the power generation from double cycle system for tidal energy utilization.   [8+8]

8. (a) Explain the principle of MHD power generation.

   (b) Derive an expression for the efficiency of thermo electric generators.   [6+10]

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Set No. 4

IV B.Tech I Semester Supplementary Examinations, Feb/Mar 2011
NON CONVENTIONAL SOURCES OF ENERGY
(Common to Electrical & Electronics Engineering and Mechanical Engineering)

Time: 3 hours   **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks
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1. (a) Discuss the economical feasibility of harnessing solar energy
   (b) Define the following:
       i. Latitude angle
       ii. Incident angle
       iii. Solar constant.   [10+6]

2. (a) Explain effects of various parameters on the performance of the collector.
   (b) Explain the following:
       i. Cosine loss
       ii. Difuse radiation.   [10+6]

3. (a) Describe the layout / schematic of a typical solar PV array.
   (b) Compare solar PV system with solar thermal system with reference to
       i. Future prospects
       ii. Applications.   [10+6]

4. (a) Explain terms :
       i. Planetary boundary
       ii. Surface layer
       iii. Ekman layer.
   (b) Derive an expression for energy available in the wind.   [8+8]

5. (a) Explain the constructional details and working of KVIC digester
   (b) Give list of materials used for biogas generation.   [10+6]

6. What are the difficulties in large scale utilization of geothermal energy? What devlopment could increase the role of geothermal energy in future.   [16]

7. (a) Explain the turbines and generators used in small scale hydro electric.
   (b) Explain the working of Anderson cycle OTEC system with neat sketch.[6+10]

8. (a) Explain the principle and working of MHD accelerator.
   (b) Explain important factors to be considered for selecting materials for MHD generator.   [10+6]

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