Code No: 07A7EC02 **R07** **Set No. 2**

IV B.Tech I Semester Examinations,MAY 2011
NON-CONVENTIONAL SOURCES OF ENERGY
Common to Mechanical Engineering, Mechatronics, Electrical And Electronics Engineering

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

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Explain extraterrestrial and terrestrial Radiation.
   (b) Define the following :
      i. Declination
      ii. Altitude angle
      iii. Solar Constant. [10+6]
2. (a) Describe the main applications of wind energy.
   (b) What are the most favorable sites for installing of wind turbines? [10+6]
3. (a) Explain the difference between geothermal plant and thermal plant
   (b) Explain the various methods to extract geothermal energy. [8+8]
4. (a) Enumerate the different main applications of solar energy.
   (b) Write short notes on:
      i. Solar cells
      ii. Solar distillation. [8+8]
5. (a) State principle of solar thermo-electric converters.
   (b) What are the main advantages and disadvantages of a solar furnace? [10+6]
6. (a) Explain the working of Anderson cycle OTEC system with neat sketch.
   (b) Explain the power generation from single ebb cycle system. [10+6]
7. (a) Explain petrochemical regenerative fuel cell.
   (b) Explain liquid metal system of MHD power generation with neat schematic. [6+10]
8. Explain the various factors affecting the generation of biogas. [16]

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Code No: 07A7EC02 **R07** **Set No. 4**

IV B.Tech I Semester Examinations,MAY 2011
NON-CONVENTIONAL SOURCES OF ENERGY
Common to Mechanical Engineering, Mechatronics, Electrical And Electronics Engineering

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

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Explain solar waterheating system at natural circulation and forced circulation Type.
   (b) List out and explain applications of solar PV System. [8+8]
2. (a) Draw the diagram of geothermal field.
   (b) Explain the potential of geothermal resources in India. [8+8]
3. (a) Discuss the merits and demerits of Horizontal and Vertical windmills.
   (b) Derive the expression for power developed due to wind. [8+8]
4. (a) What is the fundamental principle in energy conversion from ocean waves?
   (b) Explain the fundamental principle of tidal energy generation.
   (c) What is small hydel development? Classify small hydel power stations?[3+5+8]
5. (a) Explain the principle of conversion of solar energy into heat.
   (b) Classify focusing type collectors. [8+8]
6. (a) What are the various advantages of anaerobic digestion.
   (b) Explain various dry processes of bioenergy conversion in brief. [10+6]
7. Derive the expression for monthly average of hourly global radiation on a tilted surface. [16]
8. Explain the following with relavent expressions
   (a) Seebeck effect
   (b) petier effect
   (c) Thompson effect. [16]

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Code No: 07A7EC02 **R07** **Set No. 1**

IV B.Tech I Semester Examinations,MAY 2011
NON-CONVENTIONAL SOURCES OF ENERGY
Common to Mechanical Engineering, Mechatronics, Electrical And Electronics Engineering

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

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Describe with a sketch the working of a wind energy system with main Components.
   (b) Derive the expression for power developed due to wind. [10+6]
2. (a) Explain about Beam and Diffuse radiation.
   (b) What is the standard value of solar constant. [10+6]
3. (a) Explain hydrocarbon fuel cell.
   (b) What are the advantages and disadvantages o fuel cells. [16]
4. (a) What are the civil works design considerations for mini and micro hydel power plants?
   (b) Explain the fundamental principle of tidal energy generation. [12+4]
5. (a) What is the principle of solar photovoltaic power generation?
   (b) What are the main elements of a PV system? Explain. [8+8]
6. Explain the followings with neat sketches.
   (a) Liquid dominated geothermal power plant.
   (b) Vapour dominated geothermal power plant. [10+6]
7. (a) What features of Solar energy make it attractive for use in irrigation water Pump?
   (b) Explain the following terms?
      i. Flat plate
      ii. Paraboloidal dish. [10+6]
8. (a) How do you get biogas from plant wastes.
   (b) 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. [4+12]

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Code No: 07A7EC02 **R07** **Set No. 3**

IV B.Tech I Semester Examinations,MAY 2011
NON-CONVENTIONAL SOURCES OF ENERGY
Common to Mechanical Engineering, Mechatronics, Electrical And Electronics Engineering

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

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Discuss the various sources of energy available with oceans.
   (b) Explain the methods for the utilization of tidal energy in single basin arrangement . [4+12]
2. (a) What are the advantages and disadvantages of concentrating collectors over flat Plate collectors.
   (b) Write short notes on solar radiation measurements. [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 an expression for the efficiency of thermo electric generators.
   (b) Mention a few thermo electric materials. [12+4]
5. (a) Describe with a neat sketch the working of a wind energy system with Main components.
   (b) Write short notes on:
      i. Wind energy storage
      ii. Darrius rotor. [10+6]
6. Explain the working of the followings:
   (a) Pyranometer
   (b) Pyrheliopmetre
   (c) Sunshine recorder. [6+5+5]
7. (a) Explain the operation of vapour dominated geoenergy system with a neat schematic diagram.
   (b) Explain the displacement machine with a neat sketch and mention its advantages and disadvantages. [8+8]
8. (a) What is the difference between combustion and pyrolysis? How do they generate energy.
   (b) Classify bio-mass conversion technologies and explain in brief. [8+8]

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