Code No: 07A70209 **R07** **Set No. 2**

IV B.Tech I Semester Examinations,December 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) Write short notes on solar radiation on tilted surfaces.
   (b) State principle of solar thermo-electric converters. [10+6]
2. (a) Explain the difference between geothermal plant and thermal plant.
   (b) Explain the various methods to extract geothermal energy. [8+8]
3. (a) Explain various configurations of KVIC biogas plants with neat sketches.
   (b) Explain the process of anaerobic digestion. [8+8]
4. (a) Discuss the economic feasibility of harnessing solar energy.
   (b) What is meant by renewable energy sources? [10+6]
5. (a) Define:
      i. Cut-in speed
      ii. Cut-out speed
      iii. Yaw control
      iv. Coefficient of performance of a wind mill.
   (b) Classify wind energy conversion systems. [10+6]
6. (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]
7. Explain the following with relavent expressions:
   (a) Seebeck effect
   (b) petier effect
   (c) Thompson effect. [16]
8. (a) What is the principle collection of solar energy used in a non-connective Solar pond?
   (b) Describe a passive solar space heating system. [8+8]

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Code No: 07A70209 **R07** **Set No. 4**

IV B.Tech I Semester Examinations,December 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 the principle of conversion of solar energy into heat.
   (b) Why orientation is needed in concentrating type collectors? [10+6]
2. (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]
3. (a) Describe the main considerations in selecting a site for wind generators.
   (b) Derive the expression for power developed due to wind. [10+6]
4. (a) What is the principle of solar photovoltaic power generation. What are the main elements of a PV system?
   (b) Explain the terrestrial solar radiation. [8+8]
5. (a) Discuss briefly various possible large scale applications of solar energy.
   (b) Describe the solar power plant. [10+6]
6. (a) Explain the principle of MHD power generation.
   (b) Derive an expression for the efficiency of thermo electric generators. [6+10]
7. Explain the various factors affecting the generation of biogas. [16]
8. (a) Explain the principle and operation of a liquid dominated system with a neat sketch.
   (b) Explain the displacement machine with a neat sketch and mention its advantages and disadvantages. [8+8]

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Code No: 07A70209 **R07** **Set No. 1**

IV B.Tech I Semester Examinations,December 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, what are the main elements of a PV system.
   (b) Describe thermal energy storage system. [8+8]
2. (a) Explain the construction of Chinese biogas plant.
   (b) Classify biogas plants and discuss their salient features. [6+10]
3. What are the difficulties in large scale utilization of geothermal energy? What development could increase the role of geothermal energy in future? [16]
4. (a) Describe the different Schemes for wind electric generation.
   (b) Describe the generator control schemes. [8+8]
5. Explain various methods for the utilization of the tidal energy. [16]
6. (a) Compare the following types of collectors.
      i. Flat plate
      ii. Paraboloidal
      iii. Parabolic through
   (b) Explain working of a solar thermal water pump. [8+8]
7. (a) What is solar cell? Explain its principle of operation.
   (b) What is solar energy? How solar energy may be utilized in generation of electrical power? [10+6]
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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Code No: 07A70209 **R07** **Set No. 3**

IV B.Tech I Semester Examinations,December 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) Derive the expression for power developed due to wind energy.
   (b) What are the advantages and disadvantages of vertical axis wind mills over horizontal type? [10+6]
2. Write short notes on the following:
   (a) Figure of merit of thermo couple
   (b) Fossil fuel cell
   (c) Thermal ionization. [16]
3. (a) Describe in brief, the different energy storage methods used in The solar systems.
   (b) Distinguish between an abrupt and graded in Junction. [10+6]
4. (a) What are the advantages and disadvantages at photovoltaic solar energy conversion?
   (b) Discuss the economic feasibility of harnessing solar energy. [10+6]
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 power generation from single tide system.
   (b) Explain the principle and working of a high level reservoir wave machine with neat sketch. [8+8]
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) Explain the operation of CI engine working on biogas.
   (b) Explain the constructional details and working of KVIC digester. [6+10]

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