Code No: **R42025** **R10** **Set No. 1**

IV B.Tech II Semester Regular Examinations, April/May - 2014

NON CONVENTIONAL SOURCES OF ENERGY

(Electrical and Electronics Engineering)

Time : 3 hours **Max. Marks: 75**

Answer any Five Questions

All Questions carry equal marks

*****

1 Explain the following terms:
i) Altitude Angle ii) Incident Angle iii) Zenith Angle
iv) Solar Azimuth Angle v) Hour Angle [15]

2 a) Explain the principle of conversion of solar energy in to heat. [8]
b) What are the advantages and disadvantages of concentrating collectors over a flat - plate collectors? [7]

3 a) Explain with a neat sketch the working of a wind energy systems(WECS) with main components [8]
b) What are the advantages of vertical axis machines over horizontal type? Describe a rotor for relatively low velocity speed [7]

4 a) Explain Maximum Power point tracking procedure for a Wind System [8]
b) Explain the importance of Buck-Boost converter in PV System [7]

5 a) What is meant by wet fermentation and dry fermentation? [8]
b) What are the factors which affect the size of the Bio Gas Plants? [7]

6 a) Define a Geothermal Source. [5]
b) Explain the principle of total flow concept. Compare it with other system [10]

7 Explain with neat sketches the various methods of Tidal power generation .What are the limitations of each method [15]

8 Write Short notes on the Following:
a) Materials used or Biogas generation
b) Fuel cells
c) Solar radiation data [15]

Code No: **R42025** **R10** **Set No. 2**

IV B.Tech II Semester Regular Examinations, April/May - 2014

NON CONVENTIONAL SOURCES OF ENERGY

(Electrical and Electronics Engineering)

Time : 3 hours **Max. Marks: 75**

Answer any Five Questions
All Questions carry equal marks
*****

1 a) Explain about the Beam and Diffuse radiation [5]

b) Calculate the angle made by the beam radiation with the normal to a flat-plate collector, pointing due south located in New Delhi (28^0 38'N,77^0 17' E) at 9 : 00 hour, solar time on December 1. The collector is tilted at angle of 46^0 with the horizontal. [10]

2 What are the main components of a flat – plate solar collector, explain the function of each [15]

3 a) Explain the basic principle of wind energy conversion? [7]

b) Explain horizontal axis type aerogenerators. [8]

4 Explain the outcome and different considerations that need to be taken care while connecting PV cells in Series and Parallel [15]

5 a) What are the advantages and disadvantages of floating Drum Plant [8]

b) What is a community biogas plant? What are the main problems encountered in its operation [7]

6 a) What are the limitations of a flashed steam system? [8]

b) What are the advantages of double flash system? [7]

7 Explain the closed cycle OTEC System, with its advantages over open cycle system [15]

8 Write Short notes on the Following:
a) Main Applications of Biogas
b) Limitation of Wave energy conversion
c) Solar cooling Technique [15]

Code No: **R42025** **R10** **Set No. 3**

IV B.Tech II Semester Regular Examinations, April/May - 2014

NON CONVENTIONAL SOURCES OF ENERGY

(Electrical and Electronics Engineering)

Time : 3 hours **Max. Marks: 75**

Answer any Five Questions

All Questions carry equal marks

*****

1	a)	Define Solar Constant and explain the factors on which it depends.	[8]
	b)	Calculate the Sunset hour angle and day length at a location latitude of 38^0,on Feb 18	[7]
2	a)	How solar air collectors are classified? What are the main applications of a Drier?	[8]
	b)	Explain the different methods of Sun tracking, and why orientation is needed in concentrating type collectors?	[7]
3		Derive the expression for power developed due to wind	[15]
4		Explain Maximum Power point tracking procedure for a photovoltaic System	[15]
5	a)	How biomass conversion takes place	[7]
	b)	How are Gasifiers classified? What is Pyrolysis?	[8]
6	a)	Explain Binary cycle system for liquid dominated system	[8]
	b)	What are the advantages and disadvantages of Geothermal energy forms?	[7]
7	a)	What are the advantages and limitations of small scale hydro-electric power generation	[8]
	b)	What are the main types of OTEC power plants? Explain their working in Brief?	[7]
8		Write Short notes on the Following: a) Applications of Gasifiers b) Direct Energy Conversion c) Mini-Hydel Power plants w.r.t. OTEC	[15]

Code No: **R42025** **R10** **Set No. 4**

IV B.Tech II Semester Regular Examinations, April/May - 2014

NON CONVENTIONAL SOURCES OF ENERGY

(Electrical and Electronics Engineering)

Time : 3 hours **Max. Marks: 75**

Answer any Five Questions
All Questions carry equal marks
*****

1 a) What are the reasons for variation in solar radiation reaching the earth than received at the outside of the atmosphere? [8]
b) What is the difference between a pyrheliometer and a pyranometer? [7]

2 Enumerate the different types of concentrating type collectors. Explain the collector used in power plant for generation of Electric energy [15]

3 a) What are the main considerations in selecting a site for wind generators [8]
b) How are wind energy systems (WECS) classified? Discuss in brief [7]

4 a) Explain on what factors will the quality of a PV Cell depend? [8]
b) Explain the different Algorithms used in MPPT for a Photo Voltaic System [7]

5 What is meant by anaerobic digestion? Explain the factors which effect Biodigestion [15]

6 a) Classify Geothermal Sources [7]
b) Explain the main types of turbines, which may be used for Geothermal energy conversion [8]

7 a) What is the basic principle of ocean thermal energy conversion (OTEC)? [8]
b) Explain the Dolphin type wave power machine [7]

8 Write Short notes on the Following:
a) Betz Criteria
b) Selection of fuels
c) Combustion characteristics of Biogas. [15]