Code No: **R41033** **R10** **Set No. 1**

IV B.Tech I Semester Regular/Supplementary Examinations, Nov/Dec - 2015

ALTERNATIVE SOURCES OF ENERGY

(Mechanical Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks
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1 a) Write short note on classification of energy sources and explain about them. [8]
b) What is solar radiation? Explain sun-earth angles. [7]

2 a) What is concentration ratio? Explain about types of concentrating collectors with help of line diagrams. [8]
b) Explain different types of flat-plat collectors. [7]

3 a) Draw the layout of solar thermal power plant and explain about solar central receiver power plant. [8]
b) What are the components of solar water heater? Explain with schematic. [7]

4 a) What is the principle of wind energy conversion? Derive expression for power. [8]
b) Explain working of horizontal axis wind mill with suitable diagram. [7]

5 a) Discuss briefly the types of biogas plants. [8]
b) What are the factors which affect the generation of biogas? [7]

6 a) Explain about liquid dominated flashed steam geothermal system. [8]
b) Describe merits and demerits of geothermal energy. [7]

7 a) Compare open and closed cycle OTEC plants. [8]
b) Classify tidal power plants and explain them in brief. [7]

8 a) Draw V-I characteristic of solar cell and Explain about different types of solar PV cells. [8]
b) Explain MHD power generation technology. [7]

Code No: **R41033** **R10** **Set No. 2**

IV B.Tech I Semester Regular/Supplementary Examinations, Nov/Dec - 2015

ALTERNATIVE SOURCES OF ENERGY

(Mechanical Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks

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1	a)	What are the conventional and non conventional energy sources? Explain.	[8]
	b)	Define hour angle, declination, zenith and azimuth angle.	[7]
2	a)	Briefly explain about applications of flat-plat collector.	[8]
	b)	Write short note on materials for flat-plat and concentrating collector.	[7]
3	a)	Explain working of solar pond with neat sketch.	[8]
	b)	Write short note on solar thermal energy storage.	[7]
4	a)	Briefly explain about vertical axis wind turbines.	[8]
	b)	Discuss advantages and disadvantages of wind energy and write site selection factors.	[7]
5	a)	Explain about anaerobic digestion write its benefits and limitations.	[8]
	b)	How bio energy may be use full for rural applications? Justify your answer.	[7]
6	a)	Explain about liquid dominated binary cycle geothermal system.	[8]
	b)	What are the applications of geothermal energy and mention its disadvantages.	[7]
7	a)	Classify OTEC plants and explain open cycle plant with suitable diagram.	[8]
	b)	Differentiate wave and tidal energy.	[7]
8	a)	Describe the main components of MHD generator and also describe the flow sequence.	[8]
	b)	Why semiconductor materials used for solar PV cells? Discuss in detail.	[7]

Code No: **R41033** **R10** **Set No. 3**

IV B.Tech I Semester Regular/Supplementary Examinations, Nov/Dec - 2015

ALTERNATIVE SOURCES OF ENERGY

(Mechanical Engineering)

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

Answer any FIVE Questions

All Questions carry equal marks

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1 a) Discuss different renewable sources of energy with special reference to Indian context. [8]

b) Calculate suns altitude and azimuth angles at 10am, solar time on august 15 at latitude 26^0 50' N. [7]

2 a) Classify solar collectors. Explain about concentrating collectors. [8]

b) Discuss the performance of flat-plat collector. [7]

3 a) Explain about solar chimney power plant and write limitation of solar thermal plants. [8]

b) Write short note on solar cooker working and explain its types. [7]

4 a) Briefly explain about Savonius and Darrius wind turbines. [8]

b) Discuss power and velocity duration characteristics of wind. [7]

5 a) Explain about any two movable drum type plants with neat sketch. [8]

b) What are the materials for bio gas? Discuss its availability. [7]

6 a) Geothermal energy resources, explain in brief. [8]

b) Write in detail about hot springs and mention hot springs in India. [7]

7 a) Draw the layout of closed cycle OTEC plant and explain with limitations. [8]

b) Define progressive wave and brief about energy in waves. [7]

8 a) Explain off-grid and grid connected solar PV plants. [8]

b) Explain working principle and operation of fuel cells. [7]

Code No: **R41033** **R10** **Set No. 4**

IV B.Tech I Semester Regular/Supplementary Examinations, Nov/Dec - 2015

ALTERNATIVE SOURCES OF ENERGY

(Mechanical Engineering)

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

Answer any FIVE Questions

All Questions carry equal marks

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1 a) Determine the sunset hour angle and day length for Lucknow (latitude 26^0 50' W) for march 31^{st}. [8]

b) Differentiate conventional and non-conventional energy sources. [7]

2 a) What are the components and different types of flat-plate collector? Explain with help of schematic. [8]

b) Explain about performance of concentrating collector. [7]

3 a) How solar energy be used for cooling the building? Explain. [8]

b) Draw the layout of solar central power plant and explain its working. [7]

4 a) Classify wind turbines and discuss in brief. [8]

b) Write short note on Betz criteria. [7]

5 a) Mension biomass conversion processes and brief about direct combustion and thermo chemical conversion. [8]

b) Discuss biogas plants developed in India. [7]

6 a) Describe vapor dominated geo thermal power plant with line diagram. [8]

b) What are the different sources of geothermal energy? Explain about petro geothermal energy source. [7]

7 a) Explain about single basin and double basin tidal plants with schematic. [8]

b) Write types of OTEC plants explain any one type with neat sketch. [7]

8 a) What is p-n junction? Explain how it works in PV cell. [8]

b) Briefly explain about MHD generators. [7]