INSTITUTE OF AERONAUTICAL ENGINEERING
(Autonomous)
Dundigal, Hyderabad - 500 043

Department of Electrical and Electronics Engineering
ASSIGNMENT QUESTIONS

Course Name	:	Renewable Energy Sources
Course Code	:	**A80234**
Class	:	**IV B. Tech II Semester**
Branch	:	**Electrical and Electronics Engineering**
Year	:	**2018 – 2019**
Course Faculty	:	Mr.A.Sathish Kumar, Assistant Professor

OBJECTIVES

It introduces solar energy its radiation, collection, storage and application. It also introduces the wind energy, biomass energy, geothermal energy and ocean energy as alternative energy sources.

S. No	Question	Blooms Taxonomy Level	Course Outcome
UNIT -1 **PRINCIPLES OF SOLARRADIATION**		
Part - B (Long Answer Questions)		
1	Distinguish between renewable and nonrenewable source	Understand	1
2	Discuss about solar constant	Understand	1
3	Derive expression for beam and diffuse radiation	Understand	1
4	Summarize the reasons for variation in the amount of solar energy reaching earth surface.	Understand	1
5	Discuss why it is necessary to develop non-conventional method of generating electrical energy	Understand	2
Part – C (Analytical Questions)		
1	Describe solar radiation data? Explain the information contained in it	Understand	2
2	Calculate the angle made by beam radiation with the normal to a flat collector on December 1 at 9AM solar time for location at 28 Degree 35Min North the collector is tilted at an angle of latitude + 10 Degree with horizontal and pointing due south	Understand	2
3	Discuss about diffuse radiation	Remember	2
4	Describe about solar geometry	Understand	2
5	Distinguish between the conventional and non conventional energy sources	Understand	2
UNIT – II **SOLAR ENERGYCOLLECTION,SOLAR ENERGY STORAGE ANDAPPLICATIONS**		
Part - B (Long Answer Questions)		
1	Explain the principle of conversion of solar energy in to heat	Understand	3
2	List out classification of solar energy collectors and explain each	Understand	3
3	Define flat plate collector and explain its operation	Understand	3
4	Distinguish between advantages and disadvantages of flat plate collectors	Understand	3
5	Discuss advantages of concentrating collectors over flat plate collectors	Understand	3
Part – C (Analytical Questions)		
1	List out main components of a flat plate solar collector, explain the function of	Understand	3

S. No	Question	Blooms Taxonomy Level	Course Outcome
	each		
2	List out the applications of solar ponds and explain	Understand	3
3	Explain in detail solar Space heating and discuss PV effect	Understand	3
4	Describe detail of solar distillation and drying	Understand	3
5	With the help of a neat sketch describe a solar heating system using water heating solar collectors. What are the advantages and disadvantages of this method?	Understand	3
UNIT - III **WINDENERGY, BIO-MASS**		
Part - B (Long Answer Questions)		
1	Derive wind power equation	Understand	4
2	Explain Tip speed ratio and its limitations	Understand	4
3	List out the advantages of wind power?	Understand	4
4	Define Vertical Axis Wind Turbine (VAWT).	Understand	4
5	Explain Horizontal axis wind mills with neat sketch	Understand	4
6	Examine the operation of IC engine with biogas and discuss their performance characteristics	Understand	5
7	List out the classifications of geo thermal sources?	Understand	5
8	List out the various factors affecting bio digestion of a gas?	Understand	5
9	Explain working principle of KVIC Digester and its applications	Understand	5
Part – C (Analytical Questions)		
1	Explain lift and drag forces	Understand	4
2	Analyze Aero Dynamic forces acting on the blade	Understand	4
3	Explain brief about Darrieus Rotor	Understand	4
4	Discuss in brief about Savonius Rotor	Understand	4
5	Discuss the scheme for electric generation	Understand	4
6	Explain the classification of biogas plants	Understand	5
7	Explain the modification of SI engines to use biogas	Understand	5
8	What is the community Bio Gas plant	Understand	5
9	Explain the modification of CI engines to use biogas	Understand	5
10	What is meant by energy plantation	Understand	5
UNIT - IV **GEOTHERMALENERGY, OCEAN ENERGY**		
Part - B (Long Answer Questions)		
1	What are the classifications of geo thermal sources	Understand	6
2	Explain Hot Dry rocks (petro thermal) resources of geothermal energy and how they can be exploited as a source of energy	Understand	6
3	What are liquid dominated hydrothermal Convective systems? Write about them	Understand	6
4	With the help of a neat diagram, explain the working of a liquid dominated single flash steam system	Remember	6
5	Describe the fossil superheat hybrid system with a neat schematic	Understand	6
Part – C (Analytical Questions)		
1	Explain vapour dominated hydrothermal power plant with neat sketch and its representation on T-S diagram	Remember	6
2	With the help of neat diagram, explain the working of geothermal-preheat hybrid system	Remember	6
3	Explain how electrical energy can be generated from geothermal energy	Understand	6
4	With the help of neat diagram, explain the working of geothermal-preheat hybrid system	Remember	6

S. No	Question	Blooms Taxonomy Level	Course Outcome
5	What are the advantages and limitations of wave energy	Understand	7
	UNIT - V **Direct EnergyConversion**		
	Part - B (Long Answer Questions)		
1	Explain Carnot cycle and Thomson effect?	Remember	8
2	Discuss See beck thermo electric effect	Understand	8
3	Describe the working principle of MHD generators.	Understand	8
4	Discuss about various fuel cells and list out its applications	Understand	8
5	Explain the working of a thermoelectric generator	Understand	8
	Part – C (Analytical Questions)		
1	Derive the expression for the power and efficiency of thermionic generator	Understand	8
2	List out the needs of Direct Energy Conversion system	Understand	8
3	Describe the working principle of direct energy conversion system	Understand	8
4	Explain different examples of direct energy conversion system	Remember	9
5	Distinguish between the thermo electric effect and Thomson effect	Understand	9

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