Register Number: ……..

B.E DEGREE EXAMINATIONS: APRIL/MAY 2014

(Regulation 2009)

Sixth Semester

ELECTRICAL AND ELECTRONICS ENGINEERING

EEE115**:** Renewable Energy Sources

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Primary energy sources are sources which
   a) Provide gross energy
   b) Provide net supply of energy.
   c) Provide no net supply of energy
   d) Provide net energy yield as zero.
2. Distributed energy systems are
   a) Available in one location
   b) Are not affected by rate of consumption
   c) Not available in concentrated form
   d) Both (b) and (c)
3. The standard value of solar constant is
   a) 1367 w/m^2
   b) 1.367 w/m^2
   c) 1.958 w/m^2
   d) 1958 w/m^2
4. Maximum efficiency of a solar cell is
   a) Maximum electric power output/cell area
   b) Incident solar flux/cell area
   c) Maximum electric power output/incident solar radiation
   d) Electric power output/mechanical power input
5. Power Coefficient of wind is given by the ratio between
   a) Maximum output power and Maximum input power available in the wind
   b) Maximum output power and mechanical power on the blades.
   c) Output power and input power available in the wind.
   d) Maximum output power and total power available in the wind.
6. Cut out speed of a wind turbine means
   a) The speed at which the turbine is shut down
   b) The speed at which the turbine starts to operate.
   c) The speed at which the turbine attains maximum speed.
   d) The speed at which the turbine operates in the opposite direction to the wind.
7. Hydrolysis is a technology which converts
   a) Acetogenic bacteria to acetic acid.
   b) Solid to liquid
   c) Cellulose to alcohols.
   d) Liquid to gas.
8. pH value is
   a) Concentration of oxygen ions
   b) Concentration of hydrogen ions
   c) Concentration of nitrogen ions
   d) Concentration of carbon ions
9. Fuel cell is one which converts
   a) Mechanical to electrical energy.
   b) Electrical to Chemical energy.
   c) Kinetic to chemical energy.
   d) Chemical to electrical energy.
10. Seebeck Thermo electric effect converts
    a) Difference in voltage into heat energy
    b) Difference in current into heat energy
    c) Difference in heat into voltage
    d) Difference in temperature into voltage

PART B (10 x 2 = 20 Marks)

11. What are primary, secondary and supplementary sources of energy?
12. What are the distributed energy sources available and how do they differ from conventional energy sources?
13. What are the different types of solar thermal energy collectors?
14. What is meant by the photovoltaic effect?
15. What are the different types of forces acting on the blades of a wind turbine?
16. What are the main components of a wind energy conversion system?
17. What are the different forms of biomass conversions and their further classifications?
18. List the factors affecting biodigestion or generation of gas.
19. What is meant by MHD energy conversion?
20. What is Peltier effect?

PART C (5 x 14 = 70 Marks)

21. a) What are the conventional and unconventional energy sources and explain them briefly?

(OR)

b) Differentiate between “dispersed” and “distributed” generation and discuss about them in detail.

22. a) Discuss about the different types of solar radiation measurement instruments\ with neat sketches wherever necessary.

(OR)

b) (i) Enumerate the different types of concentrating type collectors and describe their functions with neat diagrams. (10)

(ii) W hat are the advantages and disadvantages of concentrating collectors over flat plate type collectors? (4)

23. a) (i) State the essential features of a probable site for a wind farm. (8)

(ii) What are the forces acting on the blades of a wind turbine and derive the expression for the same. (6)

(OR)

b) With a neat diagram of WECS, explain how wind energy can be converted into electrical energy, their classification, advantages and disadvantages.

24. a) What are the biomass conversion technologies available and discuss about them in detail

(OR)

b) How are the biomass plants classified and explain each one of them with relevant diagrams.

25. a) (i) What are the classifications of small hydro power stations and discuss about their components. (7)

(ii) What are the different turbines used in small scale hydro electric systems? (7)

(OR)

b) Describe the MHD open and close cycle systems with their block diagrams.

****