

Register Number.....

B.E. DEGREE EXAMINATIONS: APRIL/MAY 2012

Sixth Semester

MECHANICAL ENGINEERING

MEC141: Renewable Energy Sources

Time: Three Hours

Maximum Marks: 100

Answer All Questions:-

PART A (10 x 1 = 10 Marks)

1. Beam radiation is the sun rays _____ on the earth surface.
A) directly incident B) scattered C) diffused D) reflected
2. Radiational Solar thermal energy is
A) Converted energy B) Secondary energy C) Primary energy D) Conserved energy
3. Pyranometer is used to measure _____ radiation
A) beam B) global C) diffused D) infra red
4. What is the value of power co-efficient for Horizontal Axis Machine?
A) 0.593 B) 0.539 C) 0.7 D) 0.6
5. Axial Force of the wind turbine is directly proportional to
A) D^2 and V B) D^2 and V^2 C) D^2 and V^3 D) D^2 and V^4
6. Ratio of Energy fed back by the material to the energy received from the environment
A) Yield ratio B) Energy ratio C) Material ratio D) Environment ratio
7. 'Net energy yield is zero-those requiring highest investment-thermal insulation' indicates
A) Primary energy sources. B) Secondary energy sources.
C) Zero energy sources. D) Common energy sources.
8. The function of electrolyte in the electrolysis process is to _____
A) Increase electrical conductivity B) Decrease electrical conductivity
C) Increase thermal conductivity D) decrease thermal conductivity
9. The Sludge is used as a soil conditioner because of its _____ content
A) Oxygen B) Nitrogen C) Sulphur D) H_2S
10. Steam is continuously is vented through the fissures is called
A) Hot dry rock B) Hot spring C) Fumaroles D) Magma

PART B (10x2 = 20 Marks)

11. What is the principle of Seebeck effect?
12. Define Altitude angle and Zenith angle.
13. Define MHD.
14. What is meant by polarization of fuel cells?
15. What are the desired properties required for ion-exchange membrane electrolyte?
16. What is meant by work function in thermionic power generation?
17. Define Pyrolysis process in biomass.
18. What is meant by anaerobic digestion?.
19. Define pitch control and yaw control mechanism in wind machine
20. What are the advantages of Vertical Axis wind Machine over Horizontal Axis wind Machine?

PART C (5x14 = 70 Marks)

21. a) Discuss about various types of energy generation sources and their impacts on environment
(OR)
b) Explain the working principle of open cycle of OTEC (Claude cycle) with neat sketches.
22. a) Describe the solar radiation measurements and its types with neat sketches
(OR)
b) Explain the different types of concentrating collectors with neat sketches.
23. a) Explain the working principle of Horizontal and Vertical Axis Wind Machine with neat sketches.
(OR)
b) Draw a schematic diagram of Vapour dominated Geothermal power plant and explain its working principle with T-S diagram.
24. a) (i) Enumerate the factors affecting Bio digestion in Biogas plant. (7)
(ii) List out the advantages of anaerobic digestion. (7)
(OR)

b) Explain with neat sketches of Fixed Dome type and Floating Drum type digester and mention its advantages and disadvantages.

25. a) (i) Explain Ion Exchange Membrane fuel cell with neat sketches. (7)

(ii) Explain the different types of Polarization in fuel cells. (7)

(OR)

b) Explain Tank type and Filter Press Electrolyzer for Hydrogen production with neat sketches.
