

ORO551 – RENEWABLE ENERGY SOURCES

Important 13-Mark Questions

Part-B

Unit-I

1. Write the important differences between renewable and nonrenewable source.
2. Compose the solar energy option in detail.
3. Examine the Environmental impact of solar power
4. Express solar constant with neat diagram. (
5. Explain and derive expression for beam and diffuse radiation.
6. What are the reasons for variation in the amount of solar energy reaching earth surface.
7. Explain why it is necessary to develop non-conventional method of generating Electrical energy.
8. Explain in detail the different types of solar energy measuring instruments
9. Write short note about the suns declination and hour angle.
10. 10 Define physics of the sun.
11. Examine the working of a pyrhelimeter.
12. Write short note about sunshine recorder.
13. Examine the working of a Pyranometer.
14. Express extraterrestrial and terrestrial solar radiation.
15. Explain and derive expression for beam and diffuse radiation.
16. Compose the instrument used for measuring total radiation.
17. How can solar energy be converted into electrical Energy? Give a diagram showing the elements of such a plant.
18. Explain the difference in the working of Pyrhelimeter and pyranometer.

Unit-II

1. Describe the classification of solar energy collectors.
2. What is flat plate collector? Explain its operation.
3. Examine the working principle of various types of concentrating solar collectors with neat sketch.
4. List the main components of a flat plate solar collector, Explain the function of it.
5. Summarize the advantages and disadvantages of concentrating collectors over a flat plate collector?
6. Explain the principle of operation of Fresnel lens collector.
7. Explain Compound Parabolic Concentrators.
8. Express the principle of conversion of solar energy in to heat.
9. Explain the performance analysis of Cylindrical Parabolic Concentrator.
10. Explain the different methods of sun tracking.
11. (i) Express the basic phenomenon of solar energy conversion with suitable diagram.

- (ii) Express the solar radiation geometry at earth surface.
12. how a solar used for industrial heating system.
 13. How the solar air collector is classified? What is the main application of each?
 14. (i) Explain the transmissivity of Cover system.
(ii) Explain the Energy Balance Equation and collector efficiency.
 15. Explain the different types of Solar collectors based on the way they collect solar radiation.
 16. The load for a remote home is 2200 Wh/day. A PV system with battery storage is considered for powering this home. If the inverter efficiency is taken as 85%, Coulmb efficiency is taken as 80% ,PV derating is 90%(10% losses due to dirty and temperature) and system voltage 25 V. Calculate the size of Batteries for maximum five days of storage, if a 12 V battery with 100Ah is considered .
 17. Explain the operation of solar cell with equivalent circuit and its I-V characteristics.
 18. Explain the heat transport system used in liquid collectors.

Unit-III

1. Describe in detail about the different methods of solar storage systems.
2. Describe the latent heat and stratified storage.
3. Express the mechanical solar energy storage systems.
4. What are the applications of solar ponds?
5. Express the mechanism of solar heating/cooling technique.
6. Explain in detail solar distillation and drying.
7. 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?
8. Explain with a neat sketch the working principle of standalone and grid Connected solar system.
9. Describe the working of a solar power plant.
10. Compare solar PV system with solar thermal system.
11. Explain the different types of solar energy storage systems.
12. Examine in detail about solar pumping.
13. What are the advantages and disadvantages of PV solar energy conversion system?
14. Examine in detail about the photovoltaic energy conversion.
15. What are non-convective solar ponds? Explain the applications of solar ponds.
16. Summarize the latent heat and stratified storage in solar energy.
17. Compose the Different application of Solar Energy.
18. Explain PV effect and state the advantage and disadvantage of PV Solar Energy

Unit-IV

1. Write and explain wind power equation.
2. (i) Define Tip speed ratio.
(ii) What are the advantages of wind power
3. (i) Explain Vertical Axis Wind Turbine (VAWT).
(ii) Explain Horizontal axis wind mills with neat sketch.
4. Express the pitch control and Yaw control?
5. Compose the Constant speed constant frequency WTG unit.

6. (i) What is the principle used in the measurement of speed of the wind?
(ii) Explain the main applications of wind energy.
7. (i) Explain the difference between Bio mass and biogas.
(ii) Explain pyrolysis.
8. Explain about dry and wet fermentation process.
9. Write and Explain the classification of biogas plants.
10. Describe Chinese Type plants.
11. Express floating drum type biogas plants.
12. Illustrate the operation of IC Engine with neat sketch.
13. Express the operation of IC engine with biogas and discuss their performance characteristics.
14. Illustrate the various factors affecting bio digestion of a gas?
15. How the wind mills are classified and Explain the operation.
16. (i) Explain the main applications of wind power?
(ii) Explain the type of generator used in wind power plant?
17. Compose the classification of biogas plants.
18. Explain the modification of IC engines to use biogas.

Unit-V

1. (i) What are the classifications of geo thermal sources?
(ii) Explain Hot Dry rocks (petro thermal) resources of geothermal energy and how they can be exploited as a source of energy.
2. Explain vapour dominated hydrothermal power plant with neat sketch and its representation on T-S diagram.
3. With the help of neat diagram, explain the working of geo thermal-preheat hybrid.
4. With the help of a neat diagram, explain the working of a liquid dominated single flash steam system.
5. Explain the application of geothermal energy.
6. Explain the principle on which OTEC plants are base don
7. (i) Illustrate OTEC open cycle.
(ii) Illustrate OTEC closed (Anderson) cycle.
8. What is the minimum tidal range required for the working of tidal power plant?
9. Draw and Discuss the schematic layout of a tidal powerhouse
10. What are MHD generators? Explain its principle and working
11. Discuss about various fuel cells and its applications.
12. Compose the working of a thermoelectric generator.
13. Illustrate the advantages and disadvantages of direct energy conversion.
14. Discuss with short notes on superconductivity and gas conductivity.
15. Explain in brief the different types of prime movers for Geo Thermal energy conversion.
16. Explain the difference between single Basien and double basien arrangements
17. Compose the Principles of DEC and Need for DEC.
18. Explain direct energy conversion with any three examples.