

Uka Tarsadia University (Diwaliba Polytechnic)
Diploma in Mechanical Engineering
Assignment (ECHM-020020103)

Unit-1 Ecology and Environment

1. What is a food chain? Explain with one example.
2. Define Biotic and A-Biotic Environmental components.
3. What are the effects of ozone layer depletion?
4. What is ecology and ecosystem?
5. What are the sources of air-pollution?
6. Write Short note on hydrological process.
7. Explain Radiation effects on vegetables and animals in brief.
8. Draw the food chain of marine ecosystem.
9. Write the measures to minimize the deforestation.
10. Draw the food chain of forest ecosystem.
11. What is urbanization?
12. What are the effects of noise pollution?
13. What are the effects of air pollution?
14. Write short note on photosynthesis process.
15. What is an Ecology & Ecosystem?
16. Write short note on 'water pollution'.
17. Write a short note on Industrialization.
18. Short note on Hydrosphere and Lithosphere.
19. Short note on Stratosphere and Mesosphere.
20. What do you mean by acid rain? Explain in detail.
21. Write a short note on noise pollution.
22. Explain the scope of environment with neat sketch.
23. Write short note on biochemical process.
24. Explain: Desertification
25. Explain the Green-house effect with neat sketch.
26. What is a food chain and food web? Explain with one example.
27. Write short note on 'water pollution'.
28. Explain Global warming.
29. Write a short note on Air Pollution.
30. Write a short note on Ozone layer depletion.

Unit-2 Sustainable Development

1. What are the objective of energy management?
2. Which are the sources of waste heat recovery?
3. What is an energy conservation?
4. Enlist the different types of forests.
5. What is a renewable energy resources?
6. Explain waste management.
7. Explain potential of tidal energy in India.
8. Explain in short Energy crisis.
9. Enlist the protective roles of forest.
10. Give the advantages of waste recycling.
11. Classify the natural resources.
12. Write down principle of waste recycling.
13. Short note on potential of wind energy in India.
14. Give the classification of forests in detail.
15. Write down broad classification of natural resources.
16. Explain the energy conservation in process industries.
17. Enlist different advantages of conventional energy sources.
18. Write down the steps of energy conservation in the boilers.
19. Short note on Energy demand management.
20. Give the disadvantages of conventional sources of energy.
21. Explain potential of Bio mass energy in India.
22. Classify the natural resources.
23. List out the steps to increases fuel efficiency of vehicles.
24. Explain the concept of sustainable development.
25. Explain the methodology of energy management.
26. Give the classification of natural resources in detail.

Unit-3 Wind Power

1. Classify the HAWT.
2. Short note on Yaw control system.
3. Short note on types of wind turbine.
4. Short note on types of wind turbine.
5. What are the lift and drag force in HAWT?
6. Enlist the applications of wind mill and wind power.
7. Draw the sketch of savonius wind turbine.
8. Explain Nacelle.
9. List out the limitations of wind energy.
10. Draw the sketch of Horizontal axis wind turbine.
11. Draw sketch of Up wind turbine and Down wind turbine.
12. Enlist the uses of wind maps and wind data.
13. Explain Nacelle for wind turbine.
14. Define terms: (1) up wind turbine (2) down wind turbine
15. What are the criteria for site selection of wind mills?
16. Explain construction & working of Savonius Wind Turbine with neat sketch.
17. Give the difference between horizontal axis wind turbine and vertical axis wind.
18. Explain with neat sketch the Aerodynamic design of wind turbine blade.
19. What are the functions of pitch control and yaw control?
20. Discuss the aerodynamic design of wind turbine blade.
21. Discuss about potential of wind power generation in India.
22. Write a short note on Horizontal Axis wind turbine (HAWT) with neat sketch.
23. Draw the block diagram of wind power system and explain wind farms.
24. Short note on types of wind turbine.
25. Write a short note on Horizontal Axis wind turbine (HAWT) with neat sketch.
26. Discuss the aerodynamic design of wind turbine blade.
27. Write short note on Wind farm.

Unit-4 Solar Power

1. Give the definition of solar energy and solar radiation.
2. Explain in brief: Solar constant.
3. What are the main advantages of solar cooker?
4. Define the direct radiation and diffused radiation of solar energy.
5. List out the instruments for measuring the solar radiations.
6. Give the definition of solar thermal collector and enlist the various types of thermal collectors.
7. Write down the principle of thermocouple.
8. Draw a neat sketch of sun shine recorder.
9. List out the different types of semiconductor materials.
10. List out the various types of solar radiations rays.
11. What is the difference between pyranometer and pyreheliometer?
12. What is the function of transparent glass cover and insulation in solar heater?
13. Write down any four properties of semiconductor materials.
14. List out the applications of solar energy.
15. Give the principle of photovoltaic.
16. Explain solar PV pumping system with neat sketch.
17. Explain the working of solar air collector with neat sketch.
18. List out the merits and demerits of photo voltaic technology.
19. Explain the construction and working of pyranometer with neat sketch.
20. Explain the construction of silicon cell with neat sketch.
21. Explain the working of box type solar cooker.
22. Give the difference between liquid flat plate collector and flat plate air collector.
23. Explain the construction of liquid flat plate collector with sketch.
24. Explain the working of natural circulation solar water heater with neat sketch.
25. Explain the construction and working of sunshine recorder with neat sketch.
26. Give the different applications of photo voltaic technology.
27. Which are the effects of atmosphere on solar radiations? And describe any three effects.
28. List out the advantages and disadvantages of liquid flat plate collector.
29. Draw a neat sketch of silicon cell and enlist the properties of silicon used in solar cell.
30. Draw schematic diagram for principle of PV system & P-N junction.

Unit-5 Biomass Energy

1. Give the definition of biomass and list out the sources of biomass.
2. What do you mean by energy plantations and energy plant?
3. Define the pyrolysis and enlist the product produced from the pyrolysis process.
4. Write down the energy contents in different types of biomass.
5. Explain the hydro-generation in brief.
6. What is the difference between thermo chemical process and biochemical process?
7. Give the definition of hydro-gasification And which equipment is used in hydro- gasification?
8. What do you mean by aerobic treatment?
9. Explain in brief: Pyro-gasification.
10. What are the needs of energy plantations?
11. Draw only neat sketch of modern pyrolysis process.
12. Give the uses of biomass.
13. What do you mean by biomass conversion? And list out the different biomass conversion processes.
14. Define the anaerobic treatment.
15. State the different types of energy plants.
16. Explain the various sources of biomass.
17. Enlist the characteristics of biomass.
18. Explain the working of biogas plant with neat sketch.
19. Write down the advantages of energy plantation.
20. Explain the process of gasification in vertical gasifier.
21. Define biogas plant and list out the various factors affecting the production of biogas.
22. State the advantages and disadvantages of biomass.
23. Write short note on pyrolysis process with sketch.
24. List out the components of biogas plant and explain any three in detail.
25. Enlist the advantages and disadvantages of pyrolysis process.
26. State the different application and properties of biogas.
27. Enlist the thermo chemical processes and explain any one in detail.
28. State the advantages and disadvantages of biogas.
29. Explain the different biochemical process in brief.
30. List out the different feedstock for biogas plant and also state the advantages of biogas plant.

Unit-6 Seismic Engineering and Disaster Management

1. Define the seismology in brief.
2. Give the definition of epicenter and hypocenter.
3. List out the various types of disasters.
4. What is seismic engineering? And explain in brief.
5. Give the definition of P-wave and S- wave in earthquake.
6. Explain the seismic warning system for earthquake in brief.
7. Define the tornado in brief.
8. Give the definition of aftershocks and fore-shocks in earthquake.
9. What are the functions of disaster management department?
10. What do you mean by anthropogenic earthquake?
11. Explain the automatic fire detecting system in brief.
12. Write down precautions to be taken during and after earthquakes.
13. What is the reason for producing tsunami waves in ocean?
14. List out the various types of earthquake.
15. Enlist the important issues related to the disaster management
16. Explain the working of seismometer with neat sketch.
17. Write down a short note on tsunami.
18. Explain causes of earthquakes.
19. Explain the statically and time series methodology for earthquake.
20. Draw a neat sketch of Richter scale and list out the types of earthquake with Richter scale.
21. State the important precautions to be taken before, after and during the tsunami.
22. Give suggestions for new construction and design of building in earthquake prone area.
23. How to hurricane or cyclonic storm is formed? Write down the precaution to be taken before cyclone.
24. Define the draughts and write down the reasons for causing draughts.
25. Write down the instructions to be observed after earthquake.
26. Which are the probable effects of cyclones?
27. Explain the disaster management cycle with neat sketch.
28. What do you mean by epidemic and enlist the precautions to be taken during epidemic.
29. Write down the short note on floods.
30. Explain the gas and radioactive leakage in detail.