



Jaipur Engineering college and research centre, Shri Ram
ki Nangal, via Sitapura RIICO Jaipur- 302 022.

Academic year- 2020-
21

Department of Mechanical Engineering

Subject: Power Generation sources

ASSIGNMENT UNIT-I

CO1/Q.1 Classify the types of the energy available on the earth?

CO1/Q.2 Mention some of the long-term energy strategies available for the better energy. Also, discuss the demand and supply aspect of energy in the world.

CO1/Q.3 Briefly describe the economic reforms in Coal, oil and natural gas and electricity sectors?

CO1/Q.4 Differentiate between Energy Conservation and Energy Efficiency.

CO1/Q.5 Differentiate between Commercial and non-Commercial Energy Sources.

CO1/Q.6. Write short notes on:

- a) Availability of Renewable / Non Renewable sources
- b) Availability of Coal and Lignite
- c) Availability of Natural Gas
- d) Availability of Crude Oil and Petroleum Product
- e) Availability of Electricity

CO1/Q.7 Discuss the Energy Balance in India.

CO1/Q.8 Where India Stands in the world in the field on Energy?

CO1/Q.9. What is black carbon and how does it cause global warming?

CO1/Q.10 What is climate change? Is it different than global warming?

CO1/Q.11 What does climate change have to do with spreading disease?

CO1/Q. 12 What is a carbon footprint and how can I reduce my carbon footprint?

CO1/Q.13 What is the India doing to combat climate change?

CO1/Q 14 List the various non-conventional energy resources. Give their availability, relative merits and demerits in Indian context.



Department of Mechanical Engineering

Subject: Power Generation sources

ASSIGNMENT UNIT-II

CO2/Q.1 (a) Differentiate nuclear fusion and nuclear fission process with example. Also describe process of energy generation through nuclear fission in detail.

(b) Explain magnetic confinement and inertial confinement phenomenon in detail.

CO2/Q.2 (a) Explain different components and working principle of Tokamak reactor for electrical energy generation.

(b) What are the various advantages of nuclear fusion? Explain laser fusion reactor in detail.

CO2/Q.3 (a) Explain in detail the working of a Laser Fusion Reactor.

(b) What are the various requirements for a nuclear fusion process to take place?

CO2/Q.4 Explain the following terms in reference of nuclear fusion energy:

- (i) Magnetic heating
- (ii) Pellet fusion reactor
- (iii) Plasma heating
- (iv) Beam fusion

CO2/Q.5 Explain the fusion hybrid and cold fusion.

CO2/Q.6 (a) Differentiate Nuclear fission and Nuclear fusion.

(b) Explain Plasma confinement and Magnetic confinement.

CO2/Q.7 Write advantages of Laser fusion reactor, Hybrid, and Cold fusion.

CO2/Q.8 (a) Describe with neat sketch the working of laser fusion reactor.

(b) Briefly explain the different methods of plasma confinement.

CO2/Q.9 (a) What are the requirements of nuclear fission and fusion.

(b) Explain the following terms in detail magnetic heating pellet fusion reactor, plasma heating fusion reactor, hybrid and beam fusion reactor.

Department of Mechanical Engineering

Subject: Power Generation sources

ASSIGNMENT UNIT-III

- CO3/Q.1** (a) What is the principle of Solar photovoltaic power generation? What are the main elements of a Photovoltaic system?
- (b) How solar radiations on tilted surface can be calculated? Discuss its mathematical expressions.
- CO3/Q.2** (a) What do you mean by concentrating collector? Discuss paraboloidal and heliostat collector configuration.
- (b) Explain various components and working principle of solar cell and concept of solar cell array.
- CO3/Q.3** (a) What are the advantages and disadvantages of concentrating collectors over flat plate collectors?
- (b) Draw and explain the schematic diagram of basic solar power plant. Also write the applications of solar photovoltaic system.
- CO3/Q.4** (a) Define beam, diffuse and global radiation? Derive an expression for total radiation on titled surface.
- (b) Describe non convective solar pond for solar energy collection and storage.
- CO3/Q.5** (a) Explain types of Solar collectors and differentiate Paraboloidal and Heliostat.
- (b) Explain Solar radiation on tilted surface.
- CO3/Q.6** Explain briefly Solar cell and Solar cell array
- CO3/Q.7** (a) How solar radiation on titled surface can be calculated? Discuss mathematical used for the same.
- (b) What are the solar energy collectors and how do they function? Explain the different types of flat and concentrating collectors.
- CO3/Q.8** Explain the following terms related to solar radiation geometry. Declination, hour angle, inclination angle, zenith angle, latitude angle, solar azimuth angle, surface azimuth angle and angle of incidence.
- CO3/Q.9** (a) Explain types of Solar collectors and differentiate Paraboloid and Heliostat.



Department of Mechanical Engineering

Subject: Power Generation sources

(b) Explain Solar radiation on tilted surface.

ASSIGNMENT UNIT-IV

CO3/Q.1 (a) Explain following basic electric generation schemes through wind energy;

- (i) Constant Speed Constant Frequency
- (ii) Variable Speed Variable Frequency
- (iii) Variable Speed Constant Frequency

(b) What are the advantages of vertical Axis machines over Horizontal type machines?
Describe a rotor for relatively low velocity wind.

CO3/Q.2 Explain Wind Energy Conversion System (WECS). What are the basic components of a WECS?

(b) What do you understand by geothermal energy? What are geothermal fields?

CO3/Q.3 (a) Explain the working of Binary fluid power plant.

(b) Describe the main consideration in selecting a site for wind generators.

CO3/Q.4 (a) Differentiate horizontal axis and vertical axis wind turbine with neat and clear diagram.

CO3/Q.5 (a) Explain geothermal energy and geothermal preheat hybrid power plant.

(b) Write application of geothermal energy.

CO3/Q.6 (a) What are the conditions and criterion for selection of site for wind farm and the type of wind machine.

(b) Explain geothermal energy and geothermal preheat hybrid power plant.

CO3/Q.7 Differentiate horizontal axis and vertical axis wind turbine with neat and clear diagram.

Department of Mechanical Engineering

Subject: Power Generation sources

ASSIGNMENT UNIT-V

CO3/Q.1 Explain the concept of electricity generation through biomass. Describe the different biomass conversion technologies in brief.

(b) Explain in brief;

(i) Deen Bandhu Biogas Plant

(ii) Pragati Design Biogas Plant

CO3/Q.2 Explain the concept of electricity generation through biogas. Describe fixed dome type biogas plant in detail.

(b) Explain the Ethanol production process in detail.

CO3/Q.3 What is the origin of biomass energy? What is the present status of development of biomass energy resources in India?

(b) Explain the operation of biogas plant:

(i) Deen Bandhu Biogas Plant

(ii) Pragati Design Biogas Plant

CO3/Q.4 (a) Explain the factors that affect fuel generation of biogas.

(b) Explain the process of ethanol production from cassava. What are the uses of ethanol in power sector?

CO3/Q.5 Explain Biomass conversion technologies.

CO3/Q.6 Explain Pyrolysis scheme and Ethanol production.

CO3/Q.7 (a) Explain the process of ethanol production from cassava. What are the uses of ethanol in power sector?

(b) How biogas can be produced. Discuss its application and mechanism involved for generation.

CO3/Q.8 (a) What are the different factors considered for selection of biogas plant site.

b) What do you mean by pyrolysis? Discuss working of one of the most efficient pyrolysis unit.



Jaipur Engineering college and research centre, Shri Ram
ki Nangal, via Sitapura RIICO Jaipur- 302 022.

Academic year- 2020-
21

Department of Mechanical Engineering
Subject: Power Generation sources

ASSIGNMENT UNIT VI

- CO4/Q.1** (a) Explain different components used and power generation process through Tidal power plants. Also, describe single basin and double basin arrangement in Tidal power generation.
- (b) What are the advantages and limitations of tidal power generation?
- (c) What is the future prospect of electrical energy generation in India through Tidal power plants?
- (b) What are the limitations of Tidal energy?
- CO4/Q.2** (a) Explain double basin arrangement in Tidal power plant.
- (b) Describe briefly the advantages of non-conventional energy resources over conventional energy resources.
- CO4/Q.3** (a) What is Double basin arrangement?
- CO4/Q.4** Write advantages and limitations of Tidal Power Generation.
- CO4/Q.5** (a) What are the reasons of tide and how it can be used for power production? Draw the layout of a tidal power plant and name its various components.
- (b) Explain the environmental impact of tidal power plant.
- CO4/Q.6** (a) What do you understand by Geothermal energy? Explain different components and working principle of basic geothermal steam power plant.
- (b) Enumerate various advantages and disadvantages of geothermal energy generation. Also explain application and future prospects of geothermal energy in India.