

PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
B.Tech. Summer 2018 - 19 Examination

Semester: 8**Subject Code: 03109452****Subject Name: Renewable Energy Engineering****Date: 01/05/2019****Time: 10:30am To 01:00pm****Total Marks: 60****Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 Objective Type Questions - (All are compulsory) (Each of one mark) (15)

1. The ratio of the mass of the atmosphere through which the beam radiation passes to the mass it would pass through if the sun is directly overhead (at zenith) is
 - a) Air Mass
 - b) Radiation
 - c) Azimuth angle
 - d) None of these
2. The value of Solar constant is
 - a) 1367 W/m²
 - b) 1167 W/m²
 - c) 1267 W/m²
 - d) 1567 W/m²
3. _____ is an energy conversion device that continuously converts Mechanical energy into electrical energy.
 - a) Generator
 - b) Torque converter
 - c) Motor
 - d) Powerbank
4. What is the primary content of Biogas?
 - a) Butane
 - b) Methane
 - c) Hexane
 - d) hydrogen sulphide
5. _____ can measure direct or beam Radiation.
 - a) Infrared thermometer
 - b) Pyrheliometer
 - c) Sunshine Recorder
 - d) Anemometer
6. Ultraviolet radiation available in solar radiation is absorbed by _____ layer.
7. _____ Material is used in production of Solar Photovoltaic Cell.
8. If equator is at 0° latitude than the South Pole will be at _____ latitude.
9. _____ can measure diffuse Radiation.
10. A high tide occurs due to _____ force exerted by moon.
11. What is a solid organic matter from plants, animals and micro-organism grown on land and water and their derivatives called?
12. Define Fuel Cell.
13. Define Solar Azimuth angle.
14. List potential sites for tidal power plant in India.
15. Name a renewable energy which is obtained from the earth crust.

Q.2 Answer the following questions. (Attempt any three) (15)

- A) Difference between Renewable and Non-Renewable energy.
- B) How solar cell works?
- C) Write advantages and disadvantages of geothermal energy.
- D) Show that a wind turbine cannot extract more than 59.3% wind energy.

Q.3 A) List three types of measuring instrument used in solar energy and specify quantity/quantities it measures with unit. (07)

- B) Calculate the number of daylight hours at New Delhi on 1st December and 1st June in a leap year. (08)
- $\Phi = 28^{\circ}35'$.

OR

- B) Discuss the factors which affect the biogas production in brief. (08)

Q.4 A) How tidal power plants are classified on the basis of basins used? Explain working of double basin tidal system with neat sketch. (07)**OR**

- A) Give classification of Solar collectors. Explain evacuated tube collector briefly. (07)
- B) List down different types of fuel cells and write basic working principle of hydrogen fuel cell works. (08)