Seat No.: Enrolment No._____


# GUJARAT TECHNOLOGICAL UNIVERSITY

**BE –SEMESTER VIII EXAMINATION- SUMMER 2020**

**Subject Code: 2181910** **Dates:29/10/2020**

**Subject Name: Renewable Energy Engineering**

**Time:02.30 pm to 05.00 pm** **Total Marks: 70**

**Instructions:**

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

| | | | MARKS |
|---|---|---|---|
| **Q.1** | **(a)** | State advantages of renewable sources of energy. | **03** |
| | **(b)** | Explain concept of solar constant and Air mass? | **04** |
| | **(c)** | Write short note on sunshine recorder. | **07** |
| **Q.2** | **(a)** | Explain working principle of solar photovoltaic cell (SPV). | **03** |
| | **(b)** | What is biomass? State characteristics of biomass. | **04** |
| | **(c)** | Explain construction and working of liquid flat plate collectors. | **07** |
| | | **OR** | |
| | **(c)** | Explain in detail solar pond with neat sketch | **07** |
| **Q.3** | **(a)** | State site selection criteria for wind farm. | **03** |
| | **(b)** | State difference between pyranometer and pyreheliometer | **04** |
| | **(c)** | State the principle of Ocean Thermal Energy Conversion (OTEC). Describe the working of open cycle OTEC system with schematic diagram. | **07** |
| | | **OR** | |
| **Q.3** | **(a)** | Explain swept area, cut in speed and cut out speed for wind mill. | **03** |
| | **(b)** | List and Explain factors affecting to photosynthesis process. | **04** |
| | **(c)** | Calculate the sun's altitude and azimuth angle at 9 A.M. solar time on September 1 at latitude $23^0$ N. | **07** |
| **Q.4** | **(a)** | Define (1) Declination angle (2) Latitude angle (3) Hour angle | **03** |
| | **(b)** | State difference between aerobic and anaerobic digestion. | **04** |
| | **(c)** | Explain vapour dominated geothermal power plant with neat sketch. | **07** |
| | | **OR** | |
| **Q.4** | **(a)** | A horizontal axis wind turbine is installed at a location having free wind velocity of 18 m/s. the 75 m diameter rotor has three blades attached to the hub. Find the rotational speed of the turbine for optimal energy extraction. | **03** |
| | **(b)** | Give comparison between conventional and solar thermal power plant. | **04** |
| | **(c)** | Explain working of horizontal axis wind generator with schematic diagram. | **07** |
| **Q.5** | **(a)** | What is geothermal energy? Briefly describe the geothermal source of india. | **03** |
| | **(b)** | Give classification of wind mill. | **04** |
| | **(c)** | State comparison between floating gas holder and fixed gas holder type bio gas plant. | **07** |
| | | **OR** | |
| **Q.5** | **(a)** | Define (1) Cumulative saving (2) Life cycle saving (3) Annual saving | **03** |
| | **(b)** | Write short note on clean development mechanism. | **04** |
| | **(c)** | Write in detail about working principal of solar cell also write its advantage and disadvantages. | **07** |