Subject Code:161904

GUJARAT TECHNOLOGICAL UNIVERSITY

BE – SEMESTER – VI EXAMINATION – WINTER 2015

Date: 14/12/2015

Subject Name: Alternate Energy Sources Time:2:30pm to 5:00pm **Total Marks: 70 Instructions:** 1. Attempt all questions. 2. Make suitable assumptions wherever necessary. 3. Figures to the right indicate full marks. State the four merits and three demerits of Renewable Energy Sources. 07 **Q.1** (b) Define (1)Solar Constant (2) Terrestrial radiation (3) Extra terrestrial radiation 07 (4) Beam radiation (5) Diffuse radiation (6) Declination angle (7) Zenith angle List out three energy conversion process from Biomass. State the four factors to 07 **Q.2** be considered for site selection for biogas plant. (b) Derive the equation of power available from wind energy. Wind at 1 bar and **07** 20° C has a velocity of 12 m/s. Calculate (1) Total power density in wind stream (2) Maximum power density (3) Total power produced if rotor diameter is 60 m and its runs at 50 rpm. (b) List out the types of Solar concentrating collector. Explain construction and 07 working of Compound Parabolic Concentrator (CPC) with neat sketch. (a) Explain construction and working of Oscillation water column system with neat **Q.3** 07 sketch. State two advantages and two disadvantages of wave energy. (b) Explain the effect of four factors affecting the production of Biogas. 07 OR State the four types of Geothermal Resources. Explain construction and Q.3 07 working of Vapour dominated geothermal system with neat sketch. (b) Describe three limitations of Tidal Energy. Explain construction and working of **07** single basin tidal power plant with neat sketch. **07** 0.4 Explain application, principle, construction and working of Pyranometer with neat sketch. (b) What is Ocean thermal energy? Describe working of Open Cycle Ocean 07 Thermal Electric Conversion (OTEC) system with neat sketch. OR Classify types of Energy audit. Discuss them in details. 07 0.4 Explain working of liquid metal Magneto Hydro Dynamic (MHD) Power 07 Generation with neat sketch. State two advantages and two disadvantages of it. 0.5 Describe the working of Solar Passive Space heating and cooling with sketch. **07** What is Co-generation process? Explain Gas Turbine Co-generation system **07** with neat sketch. OR (a) What is Geothermal energy? Describe the scope of it in India. State the four Q.5 07 limitation of geothermal energy. **(b)** What is Solar pond? Explain principle and working of solar pond with sketch. 07
