

GUJARAT TECHNOLOGICAL UNIVERSITY**ME - SEMESTER-IV • EXAMINATION – SUMMER 2013****Subject Code: 742101****Date: 14-05-2013****Subject Name: Non-conventional Energy Conversion System****Time: 10.30 am - 01.00 pm****Total Marks: 70****Instructions:**

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

- Q.1 (a)** Recent trends in direct energy conversion systems. **07**
(b) Write a short note on Photo voltaic cells. **07**
- Q.2 (a)** Explain classification, advantages and disadvantages of different WECS. **07**
(b) Explain principle of MHD power generation with advantages and disadvantages of MHD plants. **07**
- OR**
- (b)** Explain detailed analysis of MHD generation. **07**
- Q.3 (a)** Write a short note on Pyranometer. **07**
(b) Define the following terms with necessary figure: **07**
a. Solar Altitude Angle
b. Solar Zenith Angle
c. Solar Azimuth Angle
d. Declination Angle
e. Latitude Angle
- OR**
- Q.3 (a)** Explain the term “Solar Constant”. Distinguish between Beam Radiation & Diffuse Radiation. What do you mean by Global Radiation? **07**
(b) Explain Thermal analysis of flat plate collectors and useful design considerations of flat plate collectors. **07**
- Q.4 (a)** Derive an expression for maximum power, maximum torque and maximum axial thrust available from a wind turbine from basic principles. **07**
(b) Explain factors affecting biogas generation. **07**
- OR**
- Q.4 (a)** Explain Floating drum bio gas plant and compare it with fixed dome type Bio gas plant. **07**
(b) Explain analysis of aerodynamics forces acting on blades. **07**
- Q.5 (a)** Explain principle of operation and design consideration of fuel cells. **07**
(b) Discuss the scope of Renewable energy utilization in India. **07**
- OR**
- Q.5 (a)** Explain Application, advantages and disadvantages of biological conversion of solar energy. **07**
(b) Explain hydrogen as alternative fuel for vehicles. **07**
