Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV (OLD) - EXAMINATION – SUMMER 2017

Subject Code:141904 **Date: 12/06/2017**

Subject Name: Non-Conventional Energy Sources

Time: 10:30 AM to 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)**	State prospects of renewable energy sources and list advantages of renewable energy sources.	**07**
	(b)	With neat sketch explain construction and working of solar cooker.	**07**
Q.2	**(a)**	Explain the terms: energy management and energy audit. Explain different methods of energy savings in residential buildings.	**07**
	(b)	Which instruments are used to measure solar radiation measurement? With neat sketch explain construction and working of any one.	**07**
		OR	
	(b)	Define following terms with neat sketches: beam radiation, air mass, solar tilt angle, day length, declination angle.	**07**
Q.3	**(a)**	Classify various types of wind mills and explain constructional features of any one.	**07**
	(b)	Explain the construction and working of KVIC biogas plant.	**07**
		OR	
Q.3	**(a)**	The following data refers to an propeller type horizontal axis wind turbine, speed of wind 10 m/s, air density 1.22Kg/m^3, rotor diameter 120m, rotor speed 40 rpm, wind power coefficient 40%, calculate 1. Total power density in wind system; 2. Total power available in wind k W; 3. Maximum extractable power; 4. Maximum torque and axial thrust.	**07**
	(b)	List advantages and disadvantages of biomass energy sources.	**07**
Q.4	**(a)**	Describe the closed cycle OTEC system. State its advantages and limitations.	**07**
	(b)	Explain single basin and double basin tidal power plants.	**07**
		OR	
Q.4	**(a)**	Compare different types of wave energy conversion devices.	**07**
	(b)	State the present status of tidal power plants in India. Why tidal energy is not being utilized?	**07**
Q.5	**(a)**	Explain design principle and operation of any one type of fuel cell.	**07**
	(b)	Write brief note on “hydrogen as an alternative fuel for vehicles”.	**07**
		OR	
Q.5	**(a)**	Describe an MHD open cycle system. What are the main advantages of an MHD power generation?	**07**
	(b)	Describe with neat sketch flat plate collector.	**07**

****