

**Program: T.Y. B. Tech.****End Semester Examination: B.Tech. Semester :VI****Course Code: ILO16022 Course Name: Renewable and Distributed Energy Systems (RDES)****Time: 2 hour****Max. Marks: 60****Instructions: 1. All three questions are compulsory**

Que. No.	Question	Max. Marks	CO	BT
Q1	Solve any Four			
i)	Explain the types of renewable energy systems with applications.	5	CO1	BT2
ii)	Compare and contrast Horizontal Axis Wind Turbines (HAWT) and Vertical Axis Wind Turbines (VAWT). (Minimum 5 pts).	5	CO2	BT5
iii)	With a neat labelled graph explain the Maximum Power Point Tracking (MPPT) and the understanding of Current-Voltage and Power-Voltage Curves.	5	CO3	BT2
iv)	What are the Biomass resources? Explain with the help of block diagram a Biomass based power generation system.	5	CO4	BT2
v)	Classify and explain the various types of wells.	5	CO5	BT5
vi)	List the methods of Hydrogen storage? Explain any one?	5	CO6	BT2

Que. No.	Question	Max. Marks	CO	BT
Q2 A	Solve any Two			
i)	Discuss the merits and de-merits of conventional energy sources.	5	CO1	BT2
ii)	Determine the power output of a wind turbine whose blades are 12 m in diameter, and when the wind speed is 6 m/s, the air density is about 1.2 kg/m^3 and the maximum power coefficient of the wind turbine is 0.35.	5	CO2	BT5
iii)	Illustrate with neat diagram the basic principle of solar photovoltaic conversion.	5	CO3	BT4
iv)	Classify and explain the various methods of harnessing geothermal energy?	5	CO5	BT5
Q2 B	Solve any One			
i)	Explain the need, potential & development of renewable energy sources.	10	CO1	BT2
ii)	With the help of neat block/cross sectional diagram illustrate the process of Wind Energy Conversion in the Wind Power Plants (WPP).	10	CO2	BT5



Que. No.	Question	Max. Marks	CO	BT
Q3	Solve any Two			
i)	What is solar PV system and their types? Illustrate the working of ON-Grid Solar system with neat diagram, its advantages and disadvantages.	10	CO3	BT4
ii)	The following data is given for a biogas digester suitable for the output of four cows: Retention time = 30 days, temperature = 30 °c, dry matter consumed per day = 5 kg, biogas yield = 0.38 m ³ /kg, Burning efficiency is 65%, methane proportion = 0.9, heat of combustion of methane = 38 MJ/ m ³ , density of dry material = 55 kg/ m ³ . Find: i) Volume of the biogas digester. ii) Volume of the biogas. iii) Power available from digester.	10	CO4	BT5
iii)	Discuss the basic principle of Ocean Thermal Energy Conversion (OTEC). Describe a closed cycle OTEC with its advantages and disadvantages.	10	CO6	BT2

Course Outcomes (CO) -Learner will be able to:

CO1: To highlight the global and national energy scenario and issues related to them.

CO2. To enlighten the points related to wind power generation capacity.

CO3. To enlighten the points related to solar power generation capacity.

CO4. To highlight the benefits and utilization of biomass energy and geothermal energy.

CO5. To highlight the benefits and utilization of geothermal energy.

CO6. To highlight the benefits and utilization of Tidal Energy, Ocean Thermal Energy Conversion.

BT1- Remembering, BT2- Understanding, BT3- Applying, BT4- Analyzing, BT5- Evaluating, BT6- Creating