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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

Eighth Semester, B.E. - Electrical and Electronics Engineering

Semester End Examination; July - 2021

Renewable Energy Sources

Time: 3 hrs *Max. Marks: 100*

***Note**: Answer any **FIVE** full questions.*

1	a.	Distinguish between renewable and non-renewable energy sources.	6
	b.	What are the advantages and limitations of non-conventional energy sources?	6
	c.	Explain the significance of energy consumption as a measure of prosperity.	8
2	a.	Define the terms; i) Zenith angle ii) Declination angle	6
	b.	Determine the local apparent time and declination at a location latitude 22°15′N, longitude 78°30′E at 12:25 IST on June 15. Equation of correction is = –(1′01″).	8
	c.	Explain the operation of pyronometer with suitable sketch.	6
3	a.	With neat sketch, explain the construction and working of solar cooker. Mention its advantages and disadvantages.	8
	b.	With a neat sketch, explain the working of solar furnace.	6
	c.	Explain the principle of operation of green houses with suitable diagrams.	6
4	a.	Explain the working of a solar pond with a neat diagram.	6
	b.	With a block diagram, explain the basic operation of grid integrated solar PV systems.	8
	c.	Explain the working of a solar water pumping system with a suitable diagram.	6
5	a.	With a suitable block diagram, explain the function of different components of WECS.	8
	b.	Identify the main considerations in selecting a site for WECS.	6
	c.	Mention the advantages and disadvantages of WECS.	6
6	a.	Derive an expression for the maximum power output of a horizantal axis wind turbine.	8
	b.	Classify the wind energy conversion systems.	6
	c.	Explain the basic principle of wind energy conversion.	6
7	a.	With a suitable diagram, explain the operation of floating drum type (KVIC) biogas plant.	10
	b.	Identify and explain the factors affecting biogas generation.	10
8	a.	Explain the following as applied to biomass conversion: i) Thermo chemical conversion ii) Anaerobic digestion iii) Fermentation	10
	b.	With a suitable diagram, explain the operation of fixed dome type biogas plant.	10

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9 a. Explain the working of Anderson cycle ocean thermal energy conversion system. 10

b. Explain the operation of single basin-single effect and single basin-double effect schemes of tidol energy conversion system. 10

10 a. A tidal power plant of the simple single basin type has a basin area of 30×10^6 m^2. The tide has a range of 12 m. The turbine, however stops operating when the head on it falls below 3 m. Calculate the energy generated in one filling (or emptying) process in kWhr, if the turbine generator efficiency is 0.73. 10

b. Explain the working of claude cycle OTEC system. 10

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