

CBCS SCHEME

USN

--	--	--	--	--	--	--	--	--	--

BETCK105E

First Semester B.E./B.Tech. Degree Examination, Dec.2025/Jan.2026
Renewable Energy Sources

Time: 3 hrs.

Max. Marks: 100

*Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
 2. M : Marks , L: Bloom's level , C: Course outcomes.*

		Module – 1	M	L	C
Q.1	a.	What is the need of Renewable Energy Sources? Explain by considering solar energy.	8	L2	CO1
	b.	Explain the principles of Renewable Energy in brief.	6	L2	CO1
	c.	Briefly explain energy sustainable development.	6	L2	CO1
OR					
Q.2	a.	Explain the extraction process of Shale oil.	8	L2	CO1
	b.	Write an explanatory note on geothermal energy.	6	L2	CO1
	c.	What is Internet of Energy (IOE)? Explain how it differs from the traditional grid system.	6	L2	CO1
Module – 2					
Q.3	a.	Distinguish between Beam and Diffuse radiation. Explain how a typical daily solar radiation is measured both on a clear and cloudy day.	6	L2	CO2
	b.	With a neat sketch, explain the working of an instrument used to measure global beam radiation of solar energy.	7	L2	CO2
	c.	Sketch and explain the working of solar pond electric power generation.	7	L2	CO2
OR					
Q.4	a.	Define the following terms with neat sketches : i) Inclination angle ii) Incident angle iii) Zenith angle iv) Solar Azimuth angle v) Declination angle.	10	L1	CO2
	b.	Determine the Local Apparent Time (LAT) and declination corresponding to 1430 h (IST) at Mumbai (19° 07' N , 72° 51' E) on July 1 st . In India , standard time is based on 82.50°E. Equation of time correction is given as -3.5 minutes.	6	L3	CO2
	c.	Explain the principle of photovoltaic power generation.	4	L2	CO2

Module – 3					
Q.5	a.	Derive an expression for Wind power and also discuss power co-efficient of wind turbine.	7	L3	CO3
	b.	Explain the major problems associated with wind power.	5	L2	CO3
	c.	With a neat sketch, explain Urban Waste to Energy Conversion Process.	8	L2	CO3
OR					
Q.6	a.	Explain basic components of Wind Energy Conversion System (WECS).	8	L2	CO3
	b.	With a neat sketch, explain Darrieus rotor type vertical axis wind mill.	8	L2	CO3
	c.	Explain the process of photosynthesis in biomass production and also list necessary conditions for photosynthesis.	4	L2	CO3
Module – 4					
Q.7	a.	With a neat sketch, explain Double basin tidal system.	7	L2	CO4
	b.	With necessary diagram, explain the working principle of closed cycle ocean thermal conversion system.	8	L2	CO4
	c.	Illustrate the major problems associated with OTEC.	5	L2	CO4
OR					
Q.8	a.	With a neat sketch, explain Open cycle OTEC system.	7	L2	CO4
	b.	Explain the advantages and limitations of wave energy.	6	L2	CO4
	c.	Sketch and explain Single basic tidal system.	7	L2	CO4
Module – 5					
Q.9	a.	Sketch and explain the working principle of Alkaline fuel cell.	8	L2	CO5
	b.	With a neat sketch, explain electrolysis method of hydrogen production.	8	L2	CO5
	c.	Write a note on Zero energy concepts.	4	L2	CO5
OR					
Q.10	a.	Explain the different methods of hydrogen storage.	8	L2	CO5
	b.	Discuss the problems associated with hydrogen energy.	6	L2	CO5
	c.	Explain the applications of hydrogen energy.	6	L2	CO5
