Reg. No.															

Question Paper Code	13665

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2025

Sixth Semester

Mechanical Engineering

20MEEL601 - RENEWABLE ENERGY SOURCES

Regulations - 2020

Duration: 3 Hours | Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	The energy output of a wind turbine is most affected by: (a) Turbine height (b) Wind speed (c) Air temperature (d) Rotor color	1	K1	CO1
2.	A major environmental concern with large hydropower plants is: (a) Air pollution (b) Deforestation and displacement (c) Global warming (d) Ozone depletion	1	K1	CO1
3.	Which of the following devices is used to convert solar energy directly into electricity? (a) Solar heater (b) Solar cooker (c) Solar panel (d) Solar dryer	1	K1	CO2
4.	Solar water heaters work based on the principle of: (a) Nuclear reaction (b) Photosynthesis (c) Conversion of light to electricity (d) Conversion of solar energy to heat energy	1	K1	CO2
5.	What is wind energy? (a) Energy from moving water (b) Energy from the sun (c) Energy from moving air (d) Energy from fossil fuels	1	K1	CO3
6.	What device is used to convert wind energy into electricity? (a) Generator (b) Turbine (c) Transformer (d) Motor	1	K1	CO3
7.	Which of the following is a disadvantage of geothermal energy? (a) Non-renewable (b) Emits large amounts of CO_2 (c) Location-specific (d) Expensive fuel required	1	K1	CO4
8.	Geothermal energy is primarily used for: (a) Transportation (b) Electricity generation and heating (c) Lighting (d) Agriculture	1	K2	CO4
9.	Biogas mainly consists of: (a) Ethane and propane (b) Hydrogen and oxygen (c) Methane and carbon dioxide (d) Nitrogen and methane	1	K2	CO5
10.	Which material is most commonly used in the manufacture of solar PV cells? (a) Copper (b) Silicon (c) Aluminum (d) Graphite	1	K1	CO6

PART - B (12 × 2 = 24 Marks)

Answer ALL Questions

		Marks	K – Level	CO
11.	What is renewable energy? Give examples.	2	K1	CO1
12.	List any four limitations of solar energy.	2	K1	CO1
13.	What are the functions of glass cover in a flat plate collector?	2	K1	CO2
14.	Define concentration ratio.	2	K1	CO2
15.	Name the principles of aerodynamic control in wind turbine.	2	K2	CO3
16.	What are the components of wind mill?	2	K1	CO3
17.	What are the classifications of geo thermal fields?	2	K1	CO4
18.	Mention the limitations of wave energy.	2	K1	CO4
19.	What is meant by biomass energy and biomass energy resource?	2	K1	CO5

20.	Classify the biomass resources.		*2*	*K2*	*CO5*
21.	What is the chemistry of Li-ion battery?		*2*	*K1*	*CO6*
22.	What factor is increased by connecting cells in series?		*2*	*K1*	*CO6*

PART - C (6 × 11 = 66 Marks)

Answer ALL Questions

23.	a)	Explain the prospects of Non-conventional energy sources in India.	*11*	*K2*	*CO1*
		OR			
	b)	Discuss the different types of renewable energy sources with examples.	*11*	*K2*	*CO1*
24.	a)	Explain the different types of concentrating type collector.	*11*	*K2*	*CO2*
		OR			
	b)	Draw schematic of heliostat based solar thermal power plant and explain the concept of generation of electric power.	*11*	*K2*	*CO2*
25.	a)	With a neat sketch explain HAWT and VAWT.	*11*	*K2*	*CO3*
		OR			
	b)	Mention the major parameters that are to be considered while selecting a wind mill site.	*11*	*K2*	*CO3*
26.	a)	Write short notes on geothermal energy potentials in India.	*11*	*K2*	*CO4*
		OR			
	b)	Explain the working of Flywheel energy storage.	*11*	*K2*	*CO4*
27.	a)	Discuss briefly the classification of Biogas plants.	*11*	*K2*	*CO5*
		OR			
	b)	Explain the construction and working of a biogas plant with a neat diagram.	*11*	*K2*	*CO5*
28.	a)	With a neat sketch demonstrate the working principle of standalone solar system.	*11*	*K2*	*CO6*
		OR			
	b)	Explain in detail about the fuel cells.	*11*	*K2*	*CO6*