TED (21) – 5033A
(REVISION-2021)

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Reg.No……
Signature…….

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/ MANAGEMENT/COMMERCIAL PRACTICE, APRIL - 2024

RENEWABLE ENERGY POWER PLANTS

[Maximum Marks:75] [Time: 3 Hours]

PART - A

I. Answer all the following questions in one word or one sentence. Each question carries 'one' marks.

(9 x 1 = 9 Marks)

		Module Outcome	Cognitive level
1	Write any two conventional sources of energy.	M1.01	R
2	Match the followings: (i) Pelton wheel — (a) Medium head (ii) Francis turbine — (b) Low head (iii) Kaplan turbine — (c) High Head	M1.02	R
3	Write any two examples of concentrated type solar collectors.	M2.01	R
4	List any two factors considered while installing solar panel.	M2.03	R
5	List any two applications of wind energy.	M3.01	R
6	Wind speed at which wind turbine starts delivering shaft power is called …….	M3.02	R
7	List any two classification of wind energy system.	M3.02	R
8	Difference in water level between high tide and low tide of an area is called ……	M4.01	R
9	Write any two advantages of fuel cell.	M4.03	R

PART - B

II. Answer *any eight* questions from the following. Each question carries 'Three' marks.

(8 x 3 = 24 Marks)

		Module Outcome	Cognitive level
1	Explain the biomass gasification process.	M1.04	U
2	Draw the structure of a parabolic trough-type solar collector and label its parts.	M2.01	R
3	Describe the working of buck converter.	M2.03	U

4	With a diagram explain the principle of wind energy conversion.	M3.01	U
5	Compare Horizontal and Vertical axis windmills.	M3.02	U
6	Draw the schematics of the horizontal axis windmill and label its parts.	M3.02	R
7	A wind turbine rotates at a speed of 20m/s and has a blade length of 80m. Determine the power in the wind. Take air density as 1.23 kg/m^3.	M3.03	A
8	Summarize power generation from tide using single basin system.	M4.01	U
9	Outline the concept of ocean thermal energy conversion.	M4.02	U
10	Describe the working of hydrogen-oxygen fuel cell.	M4.04	U

PART - C

Answer all the questions from the following. Each question carries 'seven' marks.

(6 x 7 = 42 Marks)

		Module Outcome	Cognitive level
III.	With a neat sketch explain the working of fixed dome-type biogas plant.	M1.04	U
	OR		
IV.	Draw the schematic diagram of the flash steam geothermal power plant and explain the operations.	M1.03	U
V.	Compare between conventional and non-conventional sources of energy.	M1.01	U
	OR		
VI.	Explain the floating drum-type biogas plant with a neat sketch.	M1.04	U
VII.	Draw a neat diagram of a flat plate solar collector. Explain its working.	M2.01	U
	OR		
VIII.	With block diagram explain the working of a grid connected photovoltaic system.	M2.03	U
IX.	A house has the following electrical appliance usage: Three 18 Watt fluorescent lamp with electronic ballast used 4 hours per day. One 60 Watt fan used for 6 hours per day. One 75 Watt LED TV that runs 5 hours per day. The system will be powered by 12Vdc, 110 Wp PV module. Determine the following:- 1. Solar energy consumption in Whr/day 2. Size of the PV panel 3. Rating of Inverter (Assume panel generation factor = 3.4 and a 30% loss)	M2.04	A

	OR		
X.	4 Nos of 12 V, 100 Ah batteries connected in parallel are to be charged from a solar panel. Calculate the Number of 110 Wp solar panels required for this purpose. Assume charging current = 1/10 of ampere hour rating.	M2.04	A
XI.	With block diagram explain the working of standalone wind power generation.	M3.03	U
	OR		U
XII.	Explain the Constant Speed Constant Frequency Scheme for wind power generation.	M3.04	
XIII.	Draw the block diagram of closed cycle ocean thermal energy conversion and summarize its operation.	M4.02	U
	OR		
XIV.	Explain the principle of operation MHD power generation with a neat sketch.	M4.04	U

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