GURU NANAK INSTITUTE OF TECHNOLOGY

An Autonomous Institute under MAKAUT

2020-2021

RENEWABLE SOURCE & APPLICATIONS

EC704C

TIME ALLOTTED: 3 HOURS **FULL MARKS:70**

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable

GROUP – A
(Multiple Choice Type Questions)

Answer any ***ten*** from the following, choosing the correct alternative of each question: **10×1=10**

			Marks	CO No
1.	(i)	What is total amount of solar energy received by earth and atmosphere? a) 3.8 X 10^{24} J/year b) 9.2 X 10^{24} J/year c) 5.4 X 10^{24} J/year d) 2.1 X 10^{24} J/year	1	CO1,CO2
	(ii)	Following country met more than 40% of its electricity demand from wind energy a) Denmark b) Portugal c) Ireland d) Spain	1	CO1
	(iii)	Where is the input of the MHD duct heated in a closed cycle MHD-steam power plant? a) Blast furnace b) Nuclear reactor c) Reverberatory furnace d) Combustion	1	CO2,CO3
	(iv)	A natural resource that can be replaced in same rate at which it is consumed or used is known as a) Artificial Resources b) Natural Resources c) Renewable Resources d) Nonrenewable Resources	1	CO1
	(v)	Only by-product of fuel cell is a) Acid b) Water c) Gas d) neutral chemicals	1	CO1
	(vi)	What are used to turn wind energy into electrical energy? a) Turbine b) Generators c) Yaw motor d) Blades	1	CO1

	(vii)	The process of producing energy by utilizing heat trapped inside the earth surface is called a) hydrothermal energy b) geo-Thermal energy c) solar energy d) wave energy	1	CO1,CO2
	(viii)	The motion of water in a wave is primarily a) vertical b) horizontal c) linear d) opposite	1	CO1,CO2
	(ix)	Can you think of a problem in storing liquid hydrogen inside a car? a) Because liquid hydrogen is so cold, regardless of the container it is stored in, the vehicle will be cold to the touch b) As liquid hydrogen evaporates, it will build up inside the vehicle and on long trips pose a suffocation hazard c) If liquid hydrogen was stored in a closed container, as it evaporates it would pose an explosion hazard d) Liquid hydrogen is as safe as regular gasoline and requires no additional safety measures	1	CO2
	(x)	The Claude cycle is also called as _____ a) Open cycle b) Anderson cycle c) Closed cycle d) Otto cycle	1	CO1
	(xi)	Thousands of mirrors or curved metals are used to focus solar energy to make it very hot, in a) solar cells b) solar heater c) solar furnace d) solar battery	1	CO1
	(xii)	Black painted panels which are hanged at roofs to trap heat and energy from sun, are a) solar cells b) solar heater c) solar furnace d) solar battery	1	CO1

GROUP – B
(Short Answer Type Questions)

Answer any ***three*** from the following:**3×5=15**

			Marks	**CO No**
2.	(a)	Explain the following terms showing velocity duration and power duration curve of wind energy: cut-in speed, rated wind speed, cutout speed.	5	CO1,CO2
3.	(a)	Write a Short Note on Hybrid Energy Resources	5	CO3

4.	(a)	What is a Solar Collector? Why Solar cooker box covered with a plane glass plate?	3	CO1
	(b)	What are the advantages of Renewable Energy source?	2	CO1
5.	(a)	Wire a short note on Hydrogen Fuel Cell	5	CO1
6.	(a)	Explain with neat sketches, how energy from Geothermal source can be obtained in different ways.	5	CO1,CO2

GROUP – C
(Long Answer Type Questions)

Answer any ***three*** from the following:**3×15=45**

			Marks	**CO No**
7.	(a)	Briefly describe the Stand-Alone Solar Photo Voltaic System.	6	CO1,CO2
	(b)	Draw the equivalent circuit of a practical Solar Cell and describe its I-V Characteristics.	5	CO1
	(c)	With Suitable diagram, discuss the water heating process by using Solar Energy.	4	CO1
8.	(a)	Describe the different types of Wind Turbine Generator	12	CO1
	(b)	Draw the Power vs speed characteristics of a wind turbine	3	CO1
9.	(a)	Describe the basic principle of operation of an MHD generator	7	CO1
	(b)	Discuss advantages of wind energy conversion systems.	5	CO1
	(c)	How can wave energy be utilized?	3	CO1
10.	(a)	What are the main advantages of Tidal energy?	3	CO1,CO2
	(b)	Write down the limitations of Tidal Power Schemes	3	CO1
	(c)	Describe the Different components of Wind Mill	9	CO1
11.	(a)	Describe the different technologies for Biomass Energy Conversion and its applications.	7	CO1
	(b)	Describe the Advantage & Disadvantages of Biodiesel.	3	CO2
	(c)	Write a short note on Biogas digesters.	5	CO3