Total No. of Questions: 6 *Total No. of Printed Pages:2*

Enrollment No.....

Faculty of Engineering

End Sem (Odd) Examination Dec-2022

OE00061 Solar Energy & its Utilization

Programme: B.Tech. Branch/Specialisation: All

Duration: 3 Hrs. **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d.

Q.1 i. Which of the following is the most dangerous type of radiation? **1**
(a) Alpha radiation (b) Beta radiation
(c) Gamma radiation (d) None of these

ii. The nuclear radiation unit is _____. **1**
(a) Pascal (b) Rankine (c) Reaumur (d) Roentgen

iii. Which part of flat plate collectors is coated in black? **1**
(a) Fins (b) Absorber (c) Glazing (d) Insulation

iv. What is the source of solar energy? **1**
(a) Nuclear fusion (b) Nuclear power plant
(c) Nuclear fission (d) None of these

v. In solar cells _____ material is used. **1**
(a) Copper (b) Silver (c) Silicon (d) Iron

vi. The thin bottom layer of the semiconductor in the solar cell is also called as- **1**
(a) P – type (b) N – type (c) PNP type (d) NPN type

vii. How much voltage does a single solar cell produce? **1**
(a) 1V (b) 0.5V (c) 2V (d)3V

viii. Solar cells are made from bulk materials that are cut into wafer of _____ thickness. **1**
(a) 120-180μm (b) 120-220μm
(c) 180-220μm (d) 180-240μm

ix. Plants convert solar energy into _____ energy. **1**
(a) Chemical energy (b) Light energy
(c) Heat energy (d) Mechanical energy

x. Objective of UNFCCC is to stabilize- **1**
(a) CO_2 emission (b) NO_2 emission
(c) Greenhouse gas emission (d) SO_2 emission

Q.2 i. Define diffuse radiation. **2**
ii. Write any three properties of black body. **3**
iii. Explain the any one technique for measurement of solar irradiations with suitable diagram. **5**
OR iv. Draw the solar spectrum and explain various components of that spectrum. **5**

Q.3 i. Write any two proprieties of solar collector material. **2**
ii. Explain the solar water heating system. **3**
iii. Explain the solar thermal power system with suitable diagram. **5**
OR iv. Draw and explain the working principal of flat plate collector. **5**

Q.4 i. What is solar cell? **2**
ii. Explain the working of solar panel. **3**
iii. Write and explain with diagram component of photovoltaic system. **5**
OR iv Explain the fabrication process of photovoltaic devices with suitable diagram. **5**

Q.5 i. What is organic solar cells? **2**
ii. Explain the working principal of photovoltaic cell. **3**
iii. Draw and explain the grid connected power control and management systems. **5**
OR iv. Draw and explain the photovoltaic power generation systems. **5**

Q.6 i. What is nuclear fusion? **2**
ii. Write any three economic advantages of solar energy. **3**
iii. Draw and explain life cycle analysis of solar energy systems. **5**
OR iv. What is carbon credit system? How the carbon credit evaluation for solar energy systems. **5**

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Scheme of Marking

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Note: The Paper Setter should provide the answer wise splitting of the marks in the scheme below.

Q.1	i)	a.Alpha radiation	1
	ii)	d. Roentgen	1
	iii)	b. Absorber	1
	iv)	**a.** Nuclear fusion	1
	v)	C . Silicon	1
	vi)	**a.** P – type	1
	vii)	**b. 0.5V**	1
	viii)	d. 180-240μm	1
	ix)	**a.** Chemical energy	1
	x)	c. Greenhouse gas emission	1
Q.2	i.	Defined diffuse radiation explanation of theory	2
	ii.	Write down the properties of black body each property have one mark	3
	iii.	suitable diagram 2 one technique for measurement of solar irradiations theory 3	5
OR	iv.	Draw solar spectrum 2 explain various components of that spectrum theory 3	5
Q.3	i.	Write down the proprieties of solar collectors material each property have one mark	2
	ii.	Explain the solar water heating system. theory	3
	iii.	suitable diagram of solar thermal power system 2 solar thermal power system theory 3	5
OR	iv.	Daigram of Flat Plate Collector 2 Explain the working principal of Flat Plate Collector 3	5
Q.4	i.	What is solar cell?	2
	ii.	Explain the working of solar panel.	3
	iii.	Diagram of component of photovoltaic system. 2 Theory of component of photovoltaic system 3	5
OR	iv.	suitable diagram of fabrication process of photovoltaic devices 2 Explain the fabrication process of photovoltaic device 3	
Q.5	i.	What is Organic solar cells?	2
	ii.	Explain the working principal of photovoltaic cell.	3
	iii.	Diagram of Grid connected power control and management systems. 2 Explain the Grid connected power control and management systems. 3	5
OR	iv	Diagram of photovoltaic power generation systems. 2 Explain of photovoltaic power generation systems 3	5
Q.6			
	i.	What is nuclear fusion?	2
	ii.	Write down the economic advantage of solar energy. (Any 3) each have 1 mark	3
	iii.	Diagram of life cycle analysis of solar energy systems. 2 Explain of life cycle analysis of solar energy systems 3	
OR	iv.	What is Carbon Credit system 2 how the Carbon Credit evaluation for solar energy systems. 3	

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