BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: M.SC./IMSC/PRE-PHD **SEMESTER : IV / X / I**
BRANCH: PHYSICS **SESSION : SP/2023**

SUBJECT: PH517 NONCONVENTIONAL ENERGY MATERIALS

TIME: 3 Hours **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

			CO	BL
Q.1(a)	Describe the environmental impact of conventional energy sources.	[5]	1	1
Q.1(b)	List the name of a few non-conventional energy sources. Discuss the advantages and challenges of solar energy.	[5]	1	1
Q.2(a)	Define junction potential. Derive an expression for built-in potential.	[5]	2	1
Q.2(b)	Explain the generation of photovoltage in a silicon-based solar cell.	[5]	2	2
Q.3(a)	Discuss losses in solar cells.	[5]	3	2
Q.3(b)	Define quantum efficiency. Explain how quantum efficiency can provide information about material quality.	[5]	3	5
Q.4(a)	Explain the formation of PN junction in wafer-based Si technology.	[5]	4	5
Q.4(b)	Discuss the basic principle of the dye-sensitized solar cell (DSSC). Describe the various materials used in DSSC.	[5]	4	2
Q.5(a)	Define the wet and dry process of biogas generation.	[5]	5	1
Q.5(b)	Explain the construction and working of Non-concentrating and concentrating solar collectors.	[5]	5	2

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