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

CLASS: M.Sc./IMSc **SEMESTER : IV/X**
BRANCH: PHYSICS **SESSION : SP/2024**

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)	Discuss the problems associated with conventional sources of energy. What are the advantages of Sun's Energy?	[5]	1	2
Q.1(b)	What is nuclear energy? Discuss the advantages and disadvantages of nuclear energy.	[5]	1	2
Q.2(a)	Define direct and indirect band gap semiconductors. Explain why direct band semiconductors are more appropriate for solar cell applications.	[5]	2	2
Q.2(b)	Draw an energy band diagram of a PN Junction solar cell and explain the generation of photovoltage and photocurrent.	[5]	2	4
Q.3(a)	Discuss fundamental and technological losses in solar cells.	[5]	3	2
Q.3(b)	What is quantum efficiency? Explain how the spectral response system is useful in determining solar cell properties.	[5]	3	2
Q.4(a)	Explain P N Junction formation in commercial silicon solar cells. Discuss the role of anti-reflection coatings in solar cells.	[5]	4	2
Q.4(b)	Discuss the generic advantages of thin film solar cell technology. Explain possible types of junctions in solar cells.	[5]	4	2
Q.5(a)	Discuss the advantages of Biogas technology. Define the process of biogas generation.	[5]	5	2
Q.5(b)	Explain the construction and working of horizontal and vertical windmills.	[5]	5	2

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