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Total Pages : 3

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May-2026

B.Sc. Physics, 2nd Semester

Renewable Energy and Energy Harvesting

(PHU-116-V)

Time : 3 Hours]

[Maximum Marks : 75

Instructions :

1. *It is compulsory to answer all the questions (1.5 marks each) of Part-A in short.*
2. *Answer any four questions from Part-B in detail.*
3. *Different sub-parts of a question are to be attempted adjacent to each other.*

PART – A

1. (a) Define renewable energy. (1.5)

   (b) What is fill factor in solar cell? (1.5)

   (c) What are the three types of tidal energy? (1.5)

   (d) How biogas is prepared? (1.5)

(e) Define Photovoltaic process and its application. (1.5)

(f) Explain Principal of water splitting. (1.5)

(g) What are the different Components of Solar PV System? (1.5)

(h) Define Human power. (1.5)

(i) Explain liquefaction of biomass. (1.5)

(j) Why is tidal power not used? (1.5)

PART – B

2. (a) Explain Non-conventional energy sources and their advantages. (10)

(b) Define types of Solar PV Systems. (5)

3. (a) How is hydroelectricity generated? What are hydroelectric energy advantages and disadvantages? (10)

(b) Explain solar greenhouses and its Features. (5)

4. What is Piezoelectric Material? How Piezoelectric Material Works? What are the parameters and characteristics of Piezo Sensors? (15)

5. (a) Explain electrical machines in wind turbines with diagram. (10)

(b) What are alternate Sources of energy and their limitations? (5)

6. (a) Define fossil fuels and its various sources. (10)

(b) Differentiate thermo chemical and biochemical processes. (5)

7. Explain following :

(i) Ocean Thermal Energy Conversion.

(ii) Grid interconnection Topologies in Wind Turbines.

(iii) Piezoelectric Energy harvesting applications. (3×5=15)