Reg. No. | | | | | | | | | |

PHE 455

II Semester M.Sc. Degree Examination, Sept./Oct. 2022
PHYSICS
Energy Studies (Open Elective)

Time : 3 Hours Max. Marks : 70

***Note** : Answer **any three** questions choosing **one each** from Part – **I** to Part – **III** and **four** questions from Part – **IV**.*

PART – I

1. a) How do you estimate the amount of solar energy reaching the upper atmosphere of the earth ? Explain. **8**
   b) Discuss any two forms of renewable energy resources. **5**
   c) Write a note on design aspects of solar passive systems. **5**

2. a) Explain the characteristics of a basic photovoltaic conversion system with the help of a block diagram. **8**
   b) Explain any one application of a photovoltaic conversion system with an example. **5**
   c) Discuss solar active and passive systems. **5**

PART – II

3. a) What do you mean by wind energy ? Discuss the basic principle of conversion of wind to energy, its origin and classification. **6**
   b) Explain advantages of hybrid wind energy system compared to routine wind energy system. **6**
   c) Explain various parameters of wind which affects the extraction of maximum power. **6**

4. a) Explain the Aerodynamics of a Windmill and how it influences the efficiency. **10**
   b) Differentiate between horizontal axis and vertical axis windmills and their performance. **8**

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PART – III

5. a) Explain the properties of a biogas as a fuel. **6**
   b) What is bio-digestion ? What are the factors affecting it ? **6**
   c) What is Biomass ? How it is converted into energy ? **6**

6. a) What is Gasification ? Explain its types. **8**
   b) Explain ethanol as a biofuel. **5**
   c) What are aerobic and anaerobic bioconversion processes ? Explain. **5**

PART – IV **(4×4=16)**

7. a) What is entropy ? What is its role in explaining the second law of thermodynamics ?
   b) Explain spectral distribution of extraterrestrial radiations.
   c) Basic principle of solar photovoltaic conversion.
   d) Enumerate limitations of wind energy conversions.
   e) Discuss any two types of biogas plants.
   f) Explain any two ways of converting solar energy into other forms.
