B.Sc. 3rd Semester (Honours) Examination, 2020-21

PHYSICS

Course ID: 32415 **Course Code: SH/PHS/305/SEC-1**

Course Title: Renewable Energy and Energy Harvesting

Time: 2 Hours Full Marks: 40

The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable

Section-I

Answer ***any five*** of the following: [2×5=10]

1. a) Explain the terms non-renewable and renewable energy sources with suitable examples.

   b) Why there is a need of energy conservation?

   c) What are 'syngas'?

   d) What is solar distillation?

   e) Mention the disadvantages of using non-renewable sources of energy.

   f) Are all renewable energy sources considered as clean? Answer with example.

   g) Write the name of two piezoelectric materials.

   h) Draw a schematic diagram for a method of harvesting electromagnetic energy.

Section-II

Answer ***any four*** of the following: [5×4=20]

2. a) What do you mean by geothermal energy? Briefly explain the method of generating electricity using this energy. [2+3]

   b) Discuss about the factors that may influence the efficiency of solar energy operated devices. Discuss the working of a solar cell with necessary diagrams. [2+3]

   c) What is nuclear reactor? Give some advantages of using nuclear energy. [1+4]

   d) Provide a schematic diagram of a Grid-connected PV system. [5]

   e) Why fossil fuels are still widely used particularly in developing nations? Indicate two major initiatives we should take to promote renewable energy in our country? [3+2]

   f) Write a short note on solar-tracker with proper diagram. [5]

P.T.O.

Section-III

Answer ***any one*** of the following: [10×1=10]

3. a) What do you mean by wind energy harvesting? Explain step by step operation of wind energy harvesting process. Compare wind energy harvesting and tidal energy harvesting. [2+5+3]

. b) Explain how piezo-electricity works and how it can be utilized. Write down the coupled equations relating the strain and charges in a piezoelectric material with proper explanation of the symbols. What is the use of Pyrheliometer? [5+3+2]