



M.Sc. III Semester Degree Examination, April/May - 2024

PHYSICS

Renewable Energy Physics

(NEP)

Time : 3 Hours

Maximum Marks : 70

Note : Answer **any five** of the following questions with Question No. **1 (Q.1) Compulsory**, each question carries **equal** marks.

1. (a) Describe the classification of energy resources into renewable and non-renewable categories. **8**
(b) Describe the current world energy scenario and the role of renewable energy sources. **6**
2. (a) Explain the challenges associated with the utilization of nuclear energy as a commercial energy source. **8**
(b) Outline the challenges associated with using nuclear energy as a commercial energy source. **6**
3. (a) Explain the construction and operating principle of a parabolic trough solar collector. **8**
(b) Explain the operation and benefits of solar water pumping systems. **6**
4. (a) Describe the classification of WECS based on their configuration and operation principles. Provide examples of each type. **8**
(b) Discuss the various components of a wind turbine, including the rotor, blades, gearbox, generator and tower. **6**
5. (a) How does photosynthesis convert solar energy into biomass fuels ? Explain. **8**
(b) Outline the steps involved in producing ethanol from biomass. **6**
6. (a) Evaluate the potential of ocean energy, including tidal and wave energy, as sustainable sources of electricity generation. **7**
(b) Discuss the advantages and disadvantages of solar thermal electric power generation. **7**



- 7.** (a) What strategies can be employed to mitigate the challenges posed by wind variability ? **7**
- (b) Explain the process of photosynthesis and its role in biomass energy production. **7**
- 8.** (a) Estimate the focal length of a parabolic trough with a length of 100 meters and a depth of 5 meters. **5**
- (b) Discuss the capacity factor of a wind energy system. **4**
- (c) Discuss the different types of biomass fuels commonly used for energy production. **5**

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