

2021

ELECTRONICS — GENERAL

Paper : SEC-A-2

(Renewable Energy and Energy Harvesting)

Full Marks : 80

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

Answer **question nos. 1 & 2** and **any four** questions from the rest.

1. Answer **any ten** questions : 2×10
- (a) What is meant by renewable energy sources?
 - (b) What is the main advantage of using a glass cover in a box type cooker?
 - (c) How is adequate supply of CO₂ maintained in a greenhouse?
 - (d) Define concentration ratio of a solar collector.
 - (e) What factors led to accelerated development of wind power?
 - (f) What is the origin of biomass energy?
 - (g) What do you understand by energy farming?
 - (h) What are the major applications of geothermal energy?
 - (i) What are the potential sites for tidal energy in India?
 - (j) What are the major advantages of micro-hydro resources?
 - (k) Mention two methods to harvest piezoelectric energy.
 - (l) A solar cell absorbs red light in the wavelength range 600 nm to 650 nm. What is its maximum output voltage?
2. Write short notes on **any four** of the following : 5×4
- (a) Solar Cooker
 - (b) Ocean Biomass
 - (c) Carbon capture technologies
 - (d) Geothermal Technologies
 - (e) Tidal energy.

Please Turn Over

3. (a) With the help of a schematic diagram explain the working of a solar water heating.
(b) Name three collectors requiring one axis sun tracking.
(c) What is solar house? (2+3)+3+2
4. (a) Describe the principle of solar photovoltaic (SPV) energy conversion.
(b) Illustrate the concept of load mismatch in an SVP load system.
(c) What is the effect of partial or complete shadowing of a cell in a module? 4+3+3
5. (a) What range of wind speed is considered favourable for wind power generation?
(b) Explain the mechanism of production of local winds.
(c) What do you understand by gust? 2+5+3
6. (a) What is the origin of biomass energy?
(b) What is its global potential?
(c) What is the average efficiency of photosynthetic conversion of solar energy into biomass? 3+3+4
7. (a) Explain various types of turbines considered for use in micro hydro-resources.
(b) Give few Environmental Impact of Hydro Power Sources. 5+5
8. (a) What is meant by OTEC? What are the types of OTEC plants?
(b) Explain two types of OTEC with diagram. (2+2)+(3+3)
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