

Roll No.

Total No. of Questions : 09]

[Total No. of Pages : 02

Paper ID [ME013]

(Please fill this Paper ID in OMR Sheet)

B.Tech. (Sem. - 7th/8th)

NON CONVENTIONAL ENERGY RESOURCES (DE/ME - 1.3)

Time : 03 Hours

Maximum Marks : 60

Instruction to Candidates:

- 1) Section - A is **Compulsory**.
- 2) Attempt any **Four** questions from Section - B.
- 3) Attempt any **Two** questions from Section - C.

Section - A

Q1)

(10 × 2 = 20)

- a) Enumerate criteria based on which Energy can be classified.
- b) Distinguish between Renewable and Non-renewable energy.
- c) Give reasons as to why solar photovoltaic power generation is not commercially viable.
- d) Give some major products (at least 5) based on solar thermal energy.
- e) Enumerate factors on which wind power generation depends and name states in India where wind power generation is harnessed.
- f) Give a block diagram of devices used for converting wave power into mechanical power.
- g) Name various sources of Geothermal energy and mention its types.
- h) Name materials suitably used for thermionic emission.
- i) What is a wind mill? Mention dynamic forces acting on wind mill blades?
- j) In short, explain the concept of bio-mass conversion.

Section - B

(4 × 5 = 20)

- Q2) What is meant by solar energy storage systems? Give their characteristics and discuss about their capacity.

- Q3)** Discuss design aspects of wind wheels and give their types. Also mention economic viability of wind mills. Power generated by in existing atmospheric condition is given by $P = 13.14 \times 10^{-6} A(V)^3$ kilowatts.
What are factors above that affect generation of power? Discuss.
- Q4)** What is meant by Direct Energy Conversion Systems? With the aim of a neat block diagram, discuss the principle of thermo-electric generator.
- Q5)** Discuss concept of bio-mass conversion. Briefly discuss the working of Bio gas Generation-Plant.
- Q6)** Discuss various precautions to be observed during operation of a Geothermal Power Plant. State requirements for economic viability of such plant.

Section - C

(2 × 10 = 20)

- Q7)** What is meant by concentrating collector and are its types? Discuss working of a flat-plate collector with plane reflectors and prove the expression

$$\psi = \frac{(\pi - \beta - 2\phi + 2\delta)}{3}$$

Where ψ is inclination of the reflectors and β is slope of collectors. ' ϕ ' and ' δ ' denote usual angles in concentrating collector scheme.

- Q8)** What is MHD - generation? Explain working principle of such a generator. Also discuss about MHD - materials and production of magnetic fields.
- Q9)** Write note on :
- Principle of working of a Solar Cell.
 - Working of a Tidal power plant.