

## Instructions

Read the instructions provided for every question properly before attempting the answer.

### 1. Section - A

5 marks per question

6 display questions

6 maximum answerable

Q1 MCQ - Single Answer 5 marks **CO1**

The cause of increase of CO<sub>2</sub> in environment is burning of

- Coal
- Oil
- Natural Gas
- All

Rubrics

Q2 MCQ - Single Answer 5 marks **CO1**

The renewable energy sources involve low capital cost investment and have high conversion efficiencies

- True
- False

Rubrics

Q3 MCQ - Single Answer 5 marks **CO1**

What is the best advantage of renewable energy sources?

- These are inexpensive
- These are sustainable
- These are highly energy efficient
- These are non-polluting

Rubrics

Q4 MCQ - Single Answer 5 marks **CO3**

Geothermal energy reservoirs are

Q5 MCQ - Single Answer 5 marks CO3

The expression for Carnot efficiency of OTEC is

- $\frac{\Delta T}{T_h}$
- $\frac{T_h}{\Delta T}$
- $\frac{\Delta T}{T_c}$
- $\Delta T$

Rubrics

Q6 MCQ - Single Answer 5 marks CO3

The motion of wave is

- Steady state
- Transient
- Periodic
- None of these

Rubrics

## 2. Section - B

10 marks per question

5 display questions

5 maximum answerable

Q1 Scan and/or Upload 10 marks CO2

Derive an expression for power developed due to wind.

Rubrics

Q2 Scan and/or Upload 10 marks CO2

Describe the different types of turbines used for small-scale hydroelectric plants.

Rubrics

Q3 Scan and/or Upload 10 marks CO3

In an estuary, which is being developed for tidal power generation during the tide cycle, the observed difference between high and low water of the tide was 5.5 m. It is estimated that the estuary's area 0.5 sq. km which can generate power for 3 hours in each cycle. Assuming the average available head to be 5 m and the overall efficiency of generation to be 75%, calculate i) the power in hp at any instant and ii) the total energy in the year. Seawater specific gravity = 1025 kg/m<sup>3</sup>.

Rubrics

Q4 Scan and/or Upload 10 marks CO4

The MHD generator has the following specifications.  
Plate area = 0.1 m<sup>2</sup>  
Distance between plates = 0.5 m  
Flux density = 3 Wb/m<sup>2</sup>  
Average gas velocity = 10<sup>3</sup> m/s  
Gaseous conductivity = 10 mho/m  
Calculate (i) open circuit voltage and (ii) maximum power output.

Rubrics

Q5

Scan and/or Upload

10 marks

CO4

What is a fuel cell? Describe the principle of working of a fuel cell with reference to H<sub>2</sub>-O<sub>2</sub> cell.

Rubrics

3. Section - C

20 marks per question

1 display questions

1 maximum answerable

Q1

Scan and/or Upload

20 marks

CO5

What are the different methods of hydrogen production? Explain in brief about any two methods.

Rubrics