

22661

21222

3 Hours / 70 Marks

Seat No.

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15 minutes extra for each hour

- Instructions :**
- (1) All Questions are *compulsory*.
 - (2) Illustrate your answers with neat sketches wherever necessary.
 - (3) Figures to the right indicate full marks.
 - (4) Assume suitable data, if necessary.
 - (5) Use of Non-programmable Electronic Pocket Calculator is permissible.
 - (6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Answer any FIVE :

10

- (a) Enlist any four solar thermal collectors and concentrators.
- (b) Which are the main constituents of bio-gas ?
- (c) State any four materials used for manufacturing of solar photovoltaic cells.
- (d) Write full forms of NIWE & IREDA.
- (e) State the range of power (kW) that can be produced by microhydro power stations.
- (f) State the types of batteries used in solar photovoltaic systems.
- (g) List any two types of hybrid renewable energy systems.

- 2. Answer any THREE :** **12**
- (a) Draw a labelled sketch of domestic water heating system using flat plate collector. Explain its principle of working.
 - (b) Describe maintenance procedure for solar roof top photovoltaic systems.
 - (c) Define cut-in & cut-out speed of wind turbine. State any two measurement devices used for measuring these speeds.
 - (d) Draw a labelled layout of micro-hydropower plant. Explain its principle of working.
- 3. Answer any THREE :** **12**
- (a) State any four commonly occurring faults & its remedies in commercial solar water heating systems.
 - (b) Draw layout of photovoltaic – micro grid system. Describe its principle of working.
 - (c) Draw a labelled schematic sketch of smokeless Chulha. Describe its working principle.
 - (d) Describe in brief the challenges for use of bio-gas plants.
- 4. Answer any THREE :** **12**
- (a) State the type of water turbine that can be used in microhydro power stations. Justify.
 - (b) State application and limitations of any one hybrid type renewable energy system.
 - (c) Define the terms ‘ROI’ and ‘Depreciation’ regarding financial feasibility of renewable energy systems. State the significance of these two terms.

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- (d) List any four locations in Maharashtra where large wind mill projects have been erected.
- (e) Enlist the parameters that are considered while selecting a site for micro hydropower station.

5. Answer any TWO :

12

- (a) Compare various solar concentrators on the basis of constructional features, applications & limitations. Draw schematic sketch of each.
- (b) Draw neat labelled sketch of vertical axis wind turbine. Explain its construction & working principle.
- (c) Describe various promotional schemes that are offered by central and state governments for solar photovoltaic systems.

6. Answer any TWO :

12

- (a) Enlist the parameters for selection of solar dryers for a given application with a suitable example.
- (b) Draw layout of any one type of hybrid power plant using renewable energy sources. Describe its construction and principle of working.
- (c) State various materials used as raw materials for producing bio-diesel. Justify the name 'bio-diesel'.

State which material (other than stated as answer to the above question) you think can be used as raw material, which is available in your region, for producing bio-diesel.
