

- (1) Question No.1 is compulsory
- (2) Attempt any three from the remaining
- (3) Figures to the right indicate full marks

- |  | <b>Marks</b> |
|--|--------------|
| <b>Q.1</b> Solve <b>ANY FOUR</b> questions from following. (Each question carries 5 marks)   | <b>(20)</b>  |
| a) State and explain the parameters related to batteries 1) C-rating 2) Depth of Discharge.  |              |
| b) What are different ways to use solar thermal energy? Summarize anyone in brief with the help of diagram.  |              |
| c) Discuss the working of micro-hydro power plant.   |              |
| d) Compare advantages and disadvantages of Horizontal axis wind turbine (HAWT).  |              |
| e) Summarize solid oxide fuel cell with the help of diagram.   |              |
| <b>Q.2</b> a) With neat diagram explain the working principle of solar concentrators.  | <b>(10)</b>  |
| b) Discuss Latent Thermal Energy storage. Demonstrate how solar power can be stored by using Latent heat energy storage.   | <b>(10)</b>  |
| <b>Q.3</b> a) Analyze the impact of change in solar radiation and temperature on solar PV Characteristics with a neat figure.  | <b>(10)</b>  |
| b) Discuss the mismatch in PV module and the phenomenon of hotspots.   | <b>(10)</b>  |
| <b>Q.4</b> a) Demonstrate India's reserves of Conventional and Non-Conventional energy resources. Draw the current generation status of different energy alternatives. What is the impact of CO <sub>2</sub> emissions in the environment? | <b>(10)</b>  |
| b) Interpret working of Wind energy system (WES) with its various components. What are different power converter topologies used for WES? Explain anyone in detail.  | <b>(10)</b>  |
| <b>Q.5</b> a) What are the different types of fuel cells available? Compare the features of each with neat diagrams.   | <b>(10)</b>  |
| b) Discuss the different topologies used in fuel cell power system.  | <b>(10)</b>  |
| <b>Q.6</b> a) Summarize the following technologies:<br>i) Wave energy ii) Tidal Energy   | <b>(10)</b>  |
| b) Interpret the working principle of geothermal energy conversion. Write its advantages and disadvantages   | <b>(10)</b>  |