



12244

21314

3 Hours/100 Marks

Seat No.

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- Instructions :** (1) **All** questions are **compulsory**.
(2) Answer **each** next main question on a **new** page.
(3) Illustrate your answers with **neat** sketches **wherever** necessary.
(4) Figures to the **right** indicate **full** marks.
(5) **Assume** suitable data, if **necessary**.
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MARKS

1. A) Solve **any three** of the following : 12
- a) What is the need to switch over alternate energy sources ?
 - b) List four renewable and non-renewable energy resources available in India.
 - c) State advantages and disadvantages of nuclear.
 - d) Name four factors deciding final cost of electricity purchased by customer.
- B) Solve **any one** of the following : 6
- a) Define (i) Declination angle (ii) Azimuth angle (iii) Incident angle.
 - b) Describe the transesterification process of bio-diesel production.
2. Solve **any four** of the following : 16
- a) What is "Energy Audit" ? Name two different types of energy audit.
 - b) Describe principle of wind energy conversion.
 - c) What are advantages and disadvantages of solar energy ?
 - d) Sketch and explain space heating by passive method.
 - e) Write down instruments required for energy audit.
 - f) Sketch and explain heat pipe.
3. Solve **any four** of the following : 16
- a) Define (i) Power in wind (ii) Maximum power.
 - b) What is Sankey diagram ? Explain for I.C .engine.

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- c) State four considerations of selecting a site for wind hills.
- d) Write down any four applications of biodiesel.
- e) Describe working of “Fluidised bed gasifier”.
4. A) Solve **any three** of the following : 12
- a) Describe with a labeled sketch working of parabolic dish collector.
- b) State advantages and disadvantages of renewable energy (atleast 2 each).
- c) State advantages and disadvantages of geothermal energy (atleast 2 each).
- d) Describe “Plug flow digester” with labelled sketch.
- B) Solve **any one** of the following : 6
- a) Describe working of air activated and reciprocating wind pump with labeled sketch.
- b) Describe the solar green house with a labelled sketch.
5. Solve **any four** of the following : 16
- a) What is OPEC ? Name the countries.
- b) What is power coefficient and Betz limit with respect to wind energy ?
- c) Define energy management. Write four objectives of it.
- d) Which species are used as biomass ?
- e) Explain solar pumping with a neat sketch.
- f) Explain combined cycle cogeneration with diagram.
6. Solve **any four** of the following : 16
- a) Describe the principle of energy conservation.
- b) State the purpose of insulation and define “Critical thickness”.
- c) What is “Return On Investment” (ROI) as regard energy conservation ?
- d) Describe the working procedure of energy management cells.
- e) Describe the working of regeneration and draw neat sketch.
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