

# 12244

**15116**

**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) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

**Marks**

1. a) **Attempt any THREE of the following:** **12**
- (i) What is Energy? How is it important in our life?
  - (ii) Enlist any four examples each of Renewable and Non Renewable source of energy.
  - (iii) Distinguish between primary and secondary source of energy.
  - (iv) State how costing of utilities play important role to analyse and reduce energy bill.
- b) **Attempt any ONE of the following:** **6**
- (i) Describe in brief Diffuse and Direct Solar radiation. Also enlist any four angles in solar radiation geometry.
  - (ii) Enlist sources of Bio-Diesel and describe importance of Bio-Diesel as compared to conventional petroleum fuels.

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- 2. Attempt any FOUR of the following:** **16**
- a) State how solar energy can be converted into heat.
  - b) Describe the construction and working of a solar cell.
  - c) Describe how Atmospheric wind are generated and how it can be converted into other form of energy.
  - d) What is the criteria for installing Waste Recovery Unit? Describe in brief.
  - e) What is energy audit? Write preliminary audit methodology in brief.
  - f) Explain combined cycle system with a neat sketch.
- 3. Attempt any FOUR of the following:** **16**
- a) Derive an expression for wind power density.
  - b) Distinguish between Horizontal axis and Vertical axis wind mills.
  - c) Enlist the methods of obtaining energy from bio-mass and describe any one in brief.
  - d) What are the applications of gasifier?
  - e) What is the life cycle cost of an equipment?
- 4. a) Attempt any THREE of the following:** **12**
- (i) Write advantages and disadvantages of renewable energy sources.
  - (ii) Describe need of Alternate Energy Sources in brief.
  - (iii) Describe the solar green house with a neat sketch.
  - (iv) Explain covered lagoon digester in brief.
- b) Attempt any ONE of the following:** **6**
- (i) Explain how solar energy can be used for space heating and cooling.
  - (ii) Describe the use of wind energy for pumping.

**5. Attempt any FOUR of the following: 16**

- a) Explain the composition of solar radiation in brief.
- b) State the advantages and limitations of wind energy conversion.
- c) List and explain common species recommended for biomass.
- d) What are the objectives of Energy Management?
- e) Explain the use of cogeneration in sugar factory.
- f) What is reuse? Enlist its advantages.

**6. Attempt any FOUR of the following: 16**

- a) Describe the importance of energy conservation techniques in Indian economy.
  - b) Which instruments are used for energy audit? Describe in brief.
  - c) Explain the concept of Energy Management Cell.
  - d) What is the role of insulation in thermal utilities?
  - e) State four techniques of energy conservation in fans.
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