

17559

21819

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.
 - (6) Use of Non-programmable Electronic Pocket Calculator is permissible.
 - (7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.
 - (8) Use of steam tables, logarithmic, Mollier's chart is permitted.

Marks

1. (A) Attempt any **THREE** of the following : **12**
- (a) Classify the types of energy with suitable example.
 - (b) What is geothermal energy ? Why it is called renewable energy ?
 - (c) Explain need of energy audit.
 - (d) Write down the components of a wind mill.
- (B) Attempt any **ONE** of the following : **6**
- (a) Describe the electricity generation from thermal power plant with block diagram.
 - (b) Explain power factor. A three phase induction 75 kW motor operates at 55 kW. The measured voltage is 415 V, current is 80 amperes. Calculate the power factor of the motor.

2. Attempt any FOUR of the following : 16

- (a) Explain energy benchmarking.
- (b) State the salient features of EC Act 2001.
- (c) State three modes of heat transfer with example.
- (d) List out energy conservation opportunities in pump. (any eight)
- (e) Explain energy security strategies.

3. Attempt any FOUR of the following : 16

- (a) What is biomass ? Why it is called as renewable energy ?
- (b) State advantage and disadvantage of direct method for boiler efficiency calculation.
- (c) State and describe the types of energy audit.
- (d) State the capacity factor of wind energy.
- (e) Explain energy conservation and state its importance.

4. (A) Attempt any THREE of the following : 12

- (a) List out any eight energy saving opportunities in cooling tower.
- (b) Write down the construction & working of parabolic solar cooker.
- (c) Explain three T's of combustion.
- (d) Differentiate between conventional and non-conventional energy sources.

- (B) Attempt any ONE of the following :** **6**
- (a) Define specific heat and latent heat. Steam at 100 °C is condensed and cooled upto 30 °C. Calculate heat given out in kJ.
(Latent heat of condensation of steam = 540 kcal/kg, sp heat = 1 kcal/kgk)
- (b) List down and describe energy audit instruments.
- 5. Attempt any TWO of the following :** **16**
- (a) Describe cross flow cooling tower with a neat sketch.
- (b) Explain ENCON recommendation.
- (c) Explain different parts of centrifugal pump with a neat sketch.
- 6. Attempt any TWO of the following :** **16**
- (a) Explain effect of speed variation & impeller trimming in pumps.
- (b) Explain construction and working of flat plate solar water heater.
- (c) List the steps to check performance assessment of boiler.
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