

**17559****21415**

3 Hours/100 Marks

Seat No.

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- 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) *Mobile Phone, Pager and **any other** Electronic Communication devices are **not** permissible in Examination Hall.*
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MARKS1. Attempt **any ten** of the following :**20**

- Define commercial and non-commercial energy sources.
- Give the names of different types of instruments used in Energy Audit (any 4).
- Write any four short term measures which can be taken for Energy Conservation.
- Enlist the names of Non-conventional Energy Sources (any six).
- What is N.P.S.H. ? Define it.
- Write the types of Biofuels used as Bio-mass Energy.
- Write the names of different types of Boilers used in Industries.
- What is power factor ? Write its formula.
- What is primary and secondary energy sources ?
- Write the names of different instruments used for obtaining solar energy.
- Define following :
 - Dew point.
 - Dry Bulb temperature.

P.T.O.

**MARKS**

- l) What is 'Range' and "Approach" in the cooling tower ?
- m) Define flash point and fire point of a fuel.
- n) Write the names of different components of a wind mill.

2. Attempt **any four** of the following :

16

- a) What is energy benchmarking ? Write benchmarking parameters related to Gross production and equipment (any six).
- b) Write the different strategies used for "Energy Security".
- c) Give the definitions of the following :
 - 1) D.C. Current
 - 2) A.C. Current
 - 3) Ampere
 - 4) Voltage.
- d) Give any eight energy saving opportunities in the cooling towers.
- e) Write about percentage of various energy sources used for power generation in India.
- f) Compare Conventional and Non-conventional energy on the following points :
 - a) Source
 - b) Availability
 - c) Types
 - d) Examples.

3. Attempt **any four** of the following :

16

- a) What are different types of Biomass ? How biomass is used for getting energy ?
- b) What is the effect of speed variation and impeller trimming in the centrifugal pumps to increase energy efficiency ?



MARKS

- c) Write energy conservation measures in Boiler.
- d) Explain different types of Energy Audit.
- e) Draw the diagram of Biogas plant with names.
- f) Write the salient features of Energy Conservation Act, 2001.

4. Attempt **any four** of the following :

16

- a) Explain cross flow type of the cooling tower with neat sketch.
- b) How the wind energy is produced ? Explain with its parts and diagram.
- c) Define the following :
 - 1) Latent Heat
 - 2) Specific Heat
 - 3) Humidity.
- d) Explain the working of solar water heaters.
- e) A 250 W sodium vapour lamp is installed on a street. The supply voltage for a street light is 230 V and it operates for around 12 hours in a day. Considering the current of 2 A mps. and power factor of 0.85, calculate the energy consumption per day.
- f) What are the contents of detailed Energy Audit Report ?

5. Attempt **any four** of the following :

16

- a) Draw a neat sketch of Shell and Tube Heat Exchanger.
- b) What is "Leak Detector" and "Lux Meter" used in Energy Audit ? Explain.
- c) Draw the diagram of centrifugal pump and give names to its parts.
- d) What is P.A.T. ? Explain in detail about it.
- e) Explain wind mill with neat sketch.
- f) Write medium term and long term measures of energy conservation.



6. Attempt **any four** of the following :

- a) Write energy saving opportunities in the cooling towers.
 - b) How the following type of energies are produced ? Explain.
 - 1) Wave and Tidal Energy
 - 2) Geothermal Energy.
 - c) Give the steps to check performance assessment of heat exchangers.
 - d) State three modes of heat transfer. Describe in brief with example.
 - e) How electricity is generated in Thermal power plant ? Explain with block diagram.
 - f) Draw the diagram of Parabolic Solar Cooker. Explain in brief.
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