

**M. ARCH. SEM- II (SUSTAINABLE ARCHITECTURE)**  
**(2014 COURSE) (CBCS) : WINTER - 2017**  
**SUBJECT: ENERGY SYSTEMS & UTILITIES**

Day: **Tuesday**  
Date: **07/11/2017**

**W-2017-3262**

Time: **10.00 A.M. TO 12.00 NOON**  
Max Marks. 60

**N.B.**

- 1) Solve any **THREE** questions from each section.
- 2) Figures to the right indicate **FULL** marks.
- 3) Answers to both the sections should be written in **SEPARATE** answer book.

**SECTION - I**

- Q.1** Define and describe in brief following terms (Any **FIVE**) **(10)**
- a) Flash Point and Pour Point of liquid fuel
  - b) Excess Air on Combustion of fuels.
  - c) Waste Heat Recovery
  - d) Saturation Temperature and Superheat in Boiler systems.
  - e) Economic Thickness of Insulation
  - f) High Grade and Low Grade Heat in Heat Recovery Systems
  - g) Boiler blow down and Air venting in Steam Systems
- Q.2** Write short notes of the following (Any **TWO**) : **(10)**
- a) Which characteristics of Steam make it a popular media for heating? What are the properties of steam?
  - b) Boiler Types & Classification and different 'Boiler Systems'.
  - c) Steam Distribution system, its Parameters and significance of Pipe sizing.
- Q.3** Describe the following : **(10)**
- a) Write a note on various Types and Applications of Insulating materials used and their temperature ranges.
  - b) Describe construction and functioning of Waste Heat Boilers and Heat Wheel and their applications.
- Q.4** Describe Energy Conservation Opportunities in Boilers / Boiler systems. **(10)**
- Q.5** Describe construction and functioning of any Three (3) Waste heat recovery systems. **(10)**

**SECTION - II**

- Q.6** Define and describe in brief following terms (Any **FIVE**) **(10)**
- a) Technical and Commercial losses in Transmission and Distribution systems.
  - b) Capacity, Range, Approach, Effectiveness and Evaporation loss in Cooling Towers
  - c) Power factor and Maximum Demand
  - d) Transformer and Electric Motor Efficiency
  - e) Electric Motor Characteristics
  - f) Vapour Compression Air Conditioning system and Vapour Absorption Air Conditioning system.

**P.T.O.**

- Q.7** Write short notes of the following (**Any TWO**) : (10)
- a) Concept of Power factor. Describe advantages and cost benefit of Power factor improvement.
  - b) Concept of Maximum Demand. Describe Construction and functioning of Maximum Demand Controller.
  - c) Star labeling of 3-phase Induction Motors and Transformers
  - d) Write Note on Design considerations and Performance of Energy Efficient Motors.
  - f) Speed control of Induction Motors and benefits of Variable frequency drives.
- Q.8** Compare special features of Construction and Performance characteristics of Energy Efficient Motor and Standard Electric Motor. (10)
- Q.9** Write down names of components of Cooling Tower and describe energy Conservation Opportunities in Cooling Towers. (10)
- Q.10** Describe ECBC compliance for - (10)
- a) Building envelope
  - b) HVAC
  - c) Hot Water System
  - d) Electric Motors
  - e) Transformers

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