

M. ARCH. SEM- II (SUSTAINABLE ARCHITECTURE) (2014
COURSE) (CBCS) : SUMMER - 2018

SUBJECT: ENERGY SYSTEMS & UTILITIES

Day: Monday
Date: 30/04/2018

S-2018-3332

10.00 A.M. TO 12.00
Time: 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 or describe in brief following terms (Any **FIVE**) (10)
- a) Gross and Net Calorific value of fuel
 - b) Specific Heat and Latent Heat of Vapourization
 - c) Natural and Mechanical Draft
 - d) Boiler Evaporation Ratio and Boiler Efficiency.
 - e) Saturation temperature and Superheat in Boiler systems.
 - f) Hot and Cold Insulation
 - g) High Grade and Low Grade Heat in Heat Recovery systems
- Q.2** Write short notes of the following (Any **TWO**) : (10)
- a) Write note on
 - i) Characteristics of steam
 - ii) Properties of Steam
 - iii) List down Names of various types of Steam Traps being used in industries
 - b) Excess Air in Combustion of fuels and Excess Air Control
 - c) List down the Specification of Boilers, Types of Boilers and Boilers systems.
- Q.3** Describe the following : (10)
- a) Write down names of at least Ten (10) Insulating materials and Refractories.
 - b) Describe Construction and Principle of operation of Heat Pipes and Heat Pumps
- Q.4** Write a note on Efficient utilization of Steam and List down at least Ten (10) Energy Conservation Opportunities in Steam System. (10)
- Q.5** Explain the Purpose and Benefits of using Insulation in Thermal Systems. Describe three types / classification of Insulation. (10)

SECTION - II

- Q.6** Define or describe in brief following terms (Any **FIVE**) (10)
- a) Apparent Power, Active Power and Reactive Power
 - b) Maximum Demand and Power Factor
 - c) Capacity, Range, Approach, Effectiveness and Evaporation loss in Cooling Towers
 - d) Demand Side Management
 - e) Transformer and Electric Motor Efficiency
 - f) Electric Motor Characteristics
 - g) 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)** Step by step approach for Electrical Load Management and Maximum Demand Control.
 - b)** Write note on Losses in 3-phase Induction Motors and Motor Efficiency
 - c)** Principles of operation of Vapour Compression system and Vapour Absorption system for Air conditioning /Refrigeration.
 - d)** Compare Merits and demerits of Conventional and Fanless Cooling Towers.
- Q.8** List down Energy Saving Opportunities for Electric Motors and Transformers. (10)
- Q.9** Describe Heat Transfer Loops in Air Conditioning/ Refrigeration Systems and Elaborate on various Energy Opportunities in Air conditioning System in a large Industry. (10)
- Q.10** Describe Scope and Coverage of ECBC-2007 & describe various stipulations in ECBC for Building Envelope, HVAC and Lighting. (10)

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