

M. Arch. Sem- II (Sustainable Architecture) (2014 Course) (CBCS)

: WINTER - 2018

SUBJECT: ENERGY SYSTEMS & UTILITIES

Day: Thursday
Date: 22/11/2018

W-2018-3472

Time: 02.00 PM To 04.00 PM
Max Marks : 60

N.B. :

- 1) Solve any **THREE** questions from each section.
 - 2) Answer to two sections should be written in **SEPARATE** Answer books.
 - 3) Figures to the right indicate **FULL** marks.
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SECTION - I

Q.1 Define or Describe in brief following terms (**Any Five**) **(10)**

- a) Natural and Mechanical Draft
- b) Gross and Net Calorific value of Fuel
- c) Flash point and Pour point of liquid fuels
- d) High grade and Low grade heat in Heat Recovery systems
- e) Economic Thickness of Insulation
- f) Specific Heat and Calorific value of Fuels
- g) Viscosity of liquid fuels

Q.2 Write Short Notes on following (**Any Two**) **(10)**

- a) Write note on (i) Characteristics of Steam and (ii) Properties of Steam. List down names of various types of Steam Traps used in Steam systems
- b) Describe Performance Evaluation of Boilers
- c) Which characteristics of Steam make it a popular media for heating? What are the properties of steam?

Q.3 Describe the following (**Any Two**) **(10)**

- a) Write down names of at least Ten (10) Insulation materials and Refractories
- b) Describe construction and functioning of any Two types of Boilers
- c) Describe construction and functioning of Waste Heat Boiler and Heat Wheel

Q.4 Long Question **(10)**

Write a note on efficient utilization of Steam. List down at least Ten (10) Energy Conservation Opportunities in Steam systems

Q.5 Long Question **(10)**

Explain the Purpose and Benefit of using Insulation in Thermal systems. Write a short note on Classification of Insulating materials and their temperature ranges. Give names of at least three materials in each type

SECTION – II

Q.6 Define or Describe in brief following terms (**Any Five**) **(10)**

- a) Demand curve and Daily load curve
- b) Apparent power, Active power and Reactive power
- c) Maximum Demand and Power Factor
- d) Range, Approach and Effectiveness in Cooling Towers.
- e) Electric motor losses and Electric motor efficiency
- f) Vapour Compression System
- g) Cascade efficiency in Electric Power Systems

P.T.O.

- Q.7** Write Short Notes on following (**Any Two**) **(10)**
- a) Step-by-step Approach for Electrical Load management and Maximum Demand Control
 - b) Concept of Maximum Demand. Describe construction and functioning of Maximum Demand Controller
 - c) Write note on types of Fans and Blowers
 - d) Compare merits and Demerits of Conventional and Fanless Cooling Towers
- Q.8** Describe the following (**Any Two**) **(10)**
- a) List down Energy Saving Opportunities for Electric motors and Transformers
 - b) Write note on Transformer losses and Energy Labeled Transformers
 - c) Describe Heat transfer loops in Air conditioning / Refrigeration systems
- Q.9** Long Question **(10)**
- Elaborate on Energy Saving Opportunities in Air conditioning system in an Industry
- Q.10** Long Question **(10)**
- Describe ECBC Compliance requirements for Building envelope, HVAC, Hot Water system, Motors and Electric Power

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