[Total No. of Questions - 9] [Total No. of Printed Pages - 2]

May-24-0493

CE-610 (Energy Efficient Buildings)

B.Tech. 6th (CBCS)

Time : 3 Hours Max. Marks : 60

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt five questions selecting one question each from sections A, B, C and D. Section E is compulsory.

SECTION - A

1. Describe the key principles of Heating, Ventilating, and Air Conditioning' (HVAC) systems in buildings. How do they contribute to energy efficiency and indoor comfort? (10)

2. What are green buildings? Explain their basic principles and broad design strategies using suitable examples. (10)

SECTION - B

3. Explain the principle behind Sunpath diagrams and its different forms. How are they used in functional design of buildings? Provide an example how Sunpath diagrams can inform building placement and shading. (10)

4. Explain the relationship between climate, building design and energy consumption. Provide examples of climate - specific building strategies. (10)

SECTION - C

5. Discuss the significance of analyzing the results of an energy audit. Provide examples of key findings that can result from such an analysis. (10)

6. Describe, in detail, the process of conducting an energy audit, including the various steps involved in this process. (10)

SECTION - D

7. Explain the energy - efficient applications and benefits of air conditioning systems in commercial buildings. (10)

8. Explain the concept of energy management of electrical equipment and its importance in building design. (10)

SECTION - E (Compulsory)

9. (a) List out the various energy production systems. Explain any one.

   (b) Differentiate between the embodied energy and operating energy in building design.

   (c) Give the primary function of a Trombe wall in a building.

   (d) Define and explain the term "Smart Buildings".

   (e) State two benefits of conducting regular energy audits.

   (f) Explain how energy consumption per unit production is calculated.

   (g) List two common energy saving practices in the operation of electric pumps and fans.

   (h) Give the advantages of power factor improvement.

   (i) How can building design optimize natural day lighting to reduce energy consumption?

   (j) Explain the term Airborne emissions. (10×2=20)