

Energy Conservation and Green Building (315316)

MSBTE Diploma · K-Scheme · Model Question Paper — Set C

Time: 3 Hours**Max. Marks: 70****Instructions:**

1. All questions are compulsory.
2. Answer each next main question on a new page.
3. Illustrate your answers with neat sketches wherever necessary.
4. Figures to the right indicate full marks.
5. Assume suitable data, if necessary.
6. Mobile phone, pager and any other electronic communication devices are not permissible in the examination hall.

Q.1 Attempt any FIVE of the following:**10**

- a) State any two points showing the importance of energy conservation.
- b) Define green building. Name any two green buildings in India.
- c) State any two salient features of a green building.
- d) List any four parameters of Indoor Environmental Quality (IEQ).
- e) Enlist any four green building materials.
- f) Define green building audit. State its scope.
- g) Write the full forms of GRIHA and LEED.

Q.2 Attempt any THREE of the following:**12**

- a) Describe how green buildings contribute to sustainable development.
- b) Explain the salient features of the Energy Conservation Act, 2001 along with its 2022 amendment.
- c) Explain the principles of green building with a neat diagram.
- d) Explain the economic considerations of green buildings: initial cost, long-term financial benefits and impact on stakeholders.

Q.3 Attempt any THREE of the following:**12**

- a) Describe the characteristics and uses of any four green building materials.
- b) Explain energy-efficient measures adopted in the HVAC system of a green building.
- c) Explain the need and benefits of conducting a green building audit (any four).
- d) Explain LED lighting and daylighting strategies used in green buildings with a neat sketch.

Q.4 Attempt any THREE of the following:**12**

- a) Compare GRIHA and IGBC rating systems (any four points).

- b) Explain the role of Ministry of New and Renewable Energy (MNRE).
- c) Discuss the LEED criteria for green building certification.
- d) Explain the role of MEDA in energy conservation in a city.
- e) Explain Building Management System (BMS) with a block diagram.

Q.5 Attempt any TWO of the following:

12

- a) Suggest simple ways to improve energy efficiency at your home. A house has 4 ceiling fans of 75 W used 10 h/day for 300 days a year and 6 tube lights of 40 W used 6 h/day throughout the year. They are replaced by 28 W BLDC fans (₹3,200 each) and 18 W LED tubes (₹350 each). Tariff is ₹8 per kWh. Find the annual saving and simple payback period.
- b) Explain the working of a thermosiphon solar water heater with a neat sketch. State its role in a green building.
- c) Explain the strategic implementation for ensuring continuous improvement after a green building audit is completed.

Q.6 Attempt any TWO of the following:

12

- a) Explain the functions of Bureau of Energy Efficiency (BEE) and state its benefits.
- b) Explain the benefits of IGBC green rating certification to a commercial office building.
- c) A school consumes 3,000 kWh of electricity per month. Apply the steps of green building audit to assess its energy efficiency, and estimate the roof-top solar PV capacity needed to meet this demand (assume peak sun hours = 5 h/day, performance ratio = 0.75, roof area $\approx 10 \text{ m}^2$ per kWp).

Note: This is a **model question paper prepared by Ananda Technologies** only for practice and exam preparation, based on the pattern of previous MSBTE question papers and the K-scheme syllabus. It is **not an official MSBTE paper**, and it does **not** mean that these questions will come in the exam. Answers follow standard textbook points; marks shown are indicative. Free for students — anandatechnologies.in