Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 91532

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2025.

Seventh Semester

Civil Engineering

OCH 353 – ENERGY TECHNOLOGY

(Common to : Aeronautical Engineering/Aerospace Engineering/Automobile Engineering/Biomedical Engineering/Computer Science and Design/Computer Science and Engineering/Computer Science and Engineering (Artificial Intelligence and Machine Learning)/Computer Science and Engineering (Cyber Security)/Computer and Communication Engineering/Electrical and Electronics Engineering/Electronics and Communication Engineering/Electronics and Instrumentation Engineering/Electronics and Telecommunication Engineering/Environmental Engineering/Geoinformatics Engineering/Industrial Engineering/ Industrial Engineering and Management/Instrumentation and Control Engineering/Manufacturing Engineering/Marine Engineering/Materials Science and Engineering/Mechanical Engineering/ Mechanical and Automation Engineering/Mechatronics Engineering/Medical Electronics/Petrochemical Engineering/Production Engineering/Robotics and Automation/Safety and Fire Engineering/Agricultural Engineering/Artificial Engineering/ Artificial Intelligence and Data Science/Biotechnology/Biotechnology and Biochemical Engineering/Computer Science and Business Systems/Fashion Technology/Food Technology/Handloom and Textile Technology/Information Technology/Petrochemical Technology/Petroleum Engineering/Pharmaceutical Technology/Plastic Technology/Textile Chemistry/Textile Technology)

(Regulations 2021)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — ($10 \times 2 = 20$ marks)

1. Give a brief introduction to clean energy technologies.

2. Write a note on energy crisis.

3. What are the limitations of conventional energy resources?

4. Distinguish between Pressurized Water and Boiling Water nuclear reactors.

5. Write a note on solar constant.

6. What is Betz limit?

7. What are the various types of biomass gasifiers?

8. What are the functions of an electrolyte in a fuel cell?

9. How heat exchangers can save energy? Brief on any one type.

10. Write the importance of energy audit.

PART B — (5 × 13 = 65 marks)

11. (a) Discuss the present world energy resources and per capita energy consumption.

Or

(b) Explain the present energy scenario in India and the various consumption sectors when compared to the rest of the world.

12. (a) (i) Explain the construction and working of a thermal power plant. (10)

(ii) Write a note on combustion process. (3)

Or

(b) (i) Explain the construction and working of a nuclear power plant. (10)

(ii) Write a note on fluidized bed combustion. (3)

13. (a) (i) Explain the working principles of (5+5)

(1) solar distillation

(2) solar pond with neat diagrams.

(ii) Distinguish between concentrating and non-concentrating collectors. (3)

Or

(b) (i) Discuss about the principle of wind energy conversion. How is wind data collected and energy estimated? (10)

(ii) Distinguish between wave energy and tidal energy. (3)

14. (a) (i) Discuss the factors that affect the production of biogas plant. (7)

(ii) With a neat diagram explain the working of solid polymer electrolyte fuel cell. (6)

Or

(b) (i) Discuss the open and closed cycle MHD systems in detail. (7)

(ii) With a neat diagram explain the working of an alkaline fuel cell. (6)

15. (a) Discuss the various strategies to achieve energy conservation in chemical plants.

Or

(b) Discuss the ways to enhance the thermal efficiency of distillation columns in detail.

PART C — ($1 \times 15 = 15$ marks)

16. (a) Distinguish between:

(i) PEMFC and PAFC (5)

(ii) Drag and lift type blades (5)

(iii) Flat plate and concentrating collectors (5)

Or

(b) Distinguish between:

(i) SOFC and MCFC (5)

(ii) HAWT and VAWT (5)

(iii) Imaging and non-imaging concentrators. (5)