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

Question Paper Code : 91021

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2022.

Fifth/Seventh Semester

OCE 551 – AIR POLLUTION AND CONTROL ENGINEERING

(Common to: Aeronautical Engineering/Aerospace Engineering/Agriculture Engineering/Automobile Engineering/Biomedical Engineering/Computer Science and Engineering/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/Material Science and Engineering/Mechanical Engineering/ Mechanical Engineering (Sandwich)/Mechanical and Automation Engineering/ Mechatronics Engineering/ Medical Electronics/Petrochemical Engineering/Production Engineering/Robotics and Automation/Artificial Intelligence and Data Science/Bio Technology/Chemical Engineering/Chemical and Electrochemical Engineering/Fashion Technology/Food Technology/Handloom and Textile Technology/Information Technology/Petrochemical Technology/Petroleum Engineering/Pharmaceutical Technology/Textile Chemistry/Textile Technology)

(Regulations 2017)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Write the effects of photochemical smog.

2. List out the sources of Air pollution emissions.

3. Define lapse rate.

4. Define box model dispersion.

5. State the principle of cyclone filter.

6. List the control equipment used to remove fine particulate matter.

7. Mention the environmental legislation for air pollution control.

8. Define Pollution Standard Index (PSI).

9. State the noise standards.

10. Write a short note on Indoor Air Pollution.

PART B — (5 × 13 = 65 marks)

11. (a) Discuss in detail the effects of air pollution on human being and vegetation. (8+5)

Or

(b) Classify and briefly explain the various types of air pollutants.

12. (a) Explain with a neat sketch the types of Plume behaviour.

Or

(b) Explain the meteorological factors affecting air pollution.

13. (a) (i) What are the advantages and disadvantages of electrostatic precipitators? (5)

(ii) Write short note on the settling chamber. (8)

Or

(b) Design a parallel plate ESP with an efficiency of 90, 99 and 99.9% of removal of $0.75\mu m$ sized fly ash from a cement industry with gas flow rate of $10 m^3/sec$. Pilot plant studies showed that drift velocity $V_p = 2.5 \times 10^5 dp$ m/sec.

14. (a) (i) Write the general principle involved in absorption. (6)

(ii) Explain in brief the principle behind Condensation. (7)

Or

(b) Explain briefly the methods of the biological air treatment system.

15. (a) Make a note of pollution control measures in a thermal power plant.

Or

(b) List out the control measures carried out in the petroleum refining unit.

PART C — (1 × 15 = 15 marks)

16. (a) Explain the significance of the wind rose diagram. (15)

Or

(b) Explain how different atmospheric conditions give rise to a different kind of plume. (15)

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