Reg. No. : ☐☐☐☐☐☐☐☐☐☐☐☐☐

Question Paper Code : 40992

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2021.

Fifth/Seventh Semester

Mechanical Engineering

OCE 551 – AIR POLLUTION AND CONTROL ENGINEERING

(Common to Aeronautical Engineering/Aerospace Engineering/
Agriculture Engineering/Automobile Engineering/Electrical and Electronics
Engineering/Industrial Engineering/ Industrial Engineering and
Management/Materials Science and Engineering/ Mechanical Engineering
(Sandwich)/ Medical Electronics/Robotics and Automation Engineering/
Chemical Engineering /Chemical and Electrochemical Engineering/
Fashion Technology/Food Technology/Handloom and Textile Technology/
Information Technology/Pharmaceutical Technology/Textile Chemistry/
Textile Technology/Biomedical Engineering/Computer Science and Engineering/
Computer and Communication Engineering/Electronics and Communication
Engineering/Electronics and Instrumentation Engineering/
Electronics and Telecommunication Engineering/Environmental
Engineering/Geoinformatics Engineering/Instrumentation and Control
Engineering/Manufacturing Engineering/Marine Engineering/Mechanical and
Automation Engineering/ Mechatronics Engineering/
Petrochemical Engineering/Production Engineering/
Bio-Technology/Petrochemical Technology/Petroleum Engineering)

(Regulations 2017)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define secondary air pollutants.

2. Draw the layers of the atmosphere.

3. Define atmospheric stability.

4. Write the purpose of stack sampling.

5. Write the formula to calculate the efficiency of a gravity separator.

6. Write the principle involved in centrifugal separator.

7.   Mention any four control equipment for removing gaseous contaminants.

8.   What are bio filters?

9.   Write the sources of indoor air pollution.

10. Define sick building syndrome.

PART B — (5 × 13 = 65 marks)

11. (a) (i)   Explain the scales of air pollution.   (8)

         (ii) Write the effects of air pollution on vegetation.   (5)

                              Or

     (b) (i)   Define air pollution and briefly explain the various sources of air pollution.   (8)

         (ii) Write the national air quality standards for residential, industrial and sensitive areas.   (5)

12. (a) (i)   Explain subsidence inversion and radiation inversion.   (9)

         (ii) Write the assumptions of Gaussian Plume model.   (4)

                              Or

     (b) (i)   Describe with neat sketch the Plume dispersion under different stability classes.   (8)

         (ii) Explain the significance of wind rose diagram in air pollution study.   (5)

13. (a) (i)   Explain with neat sketch working principle of an Electrostatic precipitator.   (8)

         (ii) Enumerate the factors affecting selection of particulate matter control equipment.   (5)

                              Or

     (b) Discuss the functioning and operating problems associated with cyclone separator.   (13)

14. (a) Explain with neat sketch of the working principle and monitoring of an incinerator.   (13)

                              Or

     (b) (i)   Discuss the general principle involved in adsorption and condensation.   (8)

         (ii) Explain the criteria to achieve high performance in a gas absorption equipment.   (5)

15. (a) Explain the control methods and preventive measures undertaken for noise pollution. (13)

Or

(b) (i) Write the sources and types of indoor air pollutants. (5)

(ii) Enumerate the effects of noise pollution. (8)

PART C — (1 × 15 = 15 marks)

16. (a) Discuss the sources of pollutants and its control in a cement industry. (15)

Or

(b) Explain the air pollution control acts and regulation in India. (15)

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