

Reg. No. :

Question Paper Code : 21018

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2022.

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 and distinguish between primary and secondary air pollutants.
2. Name any two air pollutants and state their effect on materials.
3. What do you mean by plume?
4. What are the meteorological parameters influencing air pollutants in ambient air?
5. State any two advantages and disadvantages of gravity separators.

6. Write the components of an electrostatic precipitator and state the purpose of each.
7. List the factors influencing the efficiency of absorption process.
8. What is the use of activated carbon in air pollution control?
9. Define Indoor air pollution.
10. What is meant by sick building syndrome?

PART B — (5 × 13 = 65 marks)

11. (a) (i) Briefly explain the effects of air pollutants on plants. (7)
(ii) What are ambient air quality standards? Enumerate their importance. (6)

Or

- (b) (i) Describe the structure and composition of atmosphere. (7)
(ii) What is high volume air sampler and make a note on how the ambient air quality sampling is done using it. (6)

12. (a) Explain with neat sketches the plume behavior from a stack with respect to the different prevailing lapse rate conditions.

Or

- (b) (i) Describe the Gaussian plume model with a neat sketch. (7)
(ii) What is adiabatic lapse rate? Discuss the types of adiabatic lapse rate. (6)

13. (a) (i) Explain the different factors influencing the selection of air pollutant control equipment. (8)
(ii) Compare the bag house filters and cyclone as particulate pollutants control equipment. (5)

Or

- (b) Describe on the construction, working of any three SPM control equipments with neat sketches. (13)

14. (a) Explain the different absorption methods of controlling the gaseous contaminants. (13)

Or

- (b) (i) What are bio-filters? Explain their application in air pollution control. (7)
- (ii) Write a note on condensation process starting examples. (6)
15. (a) (i) What is noise pollution? Make a note on noise sources and state their noise levels. (7)
- (ii) Discuss how does noise pollution impact on human beings and their prevention methods. (6)

Or

- (b) (i) Make a note on how could noise control be achieved at the source by design and also in the transmission path of noise. (7)
- (ii) Define and distinguish between continuous, intermittent and impulsive noise and state their relative impacts and examples for each. (6)

PART C — (1 × 15 = 15 marks)

16. (a) Make a detailed discussion on the global environmental impacts of air pollution referring to the pollutants responsible, effects and corrective measures to control them. (15)

Or

- (b) Discuss the air pollutant control measures adopted in a
- (i) cement industry and
- (ii) textile ginning mill. (15)