# Question Paper Code : X10832

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2020

Fifth/Seventh Semester

Electrical and Electronics Engineering

OCE 551 – AIR POLLUTION AND CONTROL ENGINEERING

(Common to Agriculture Engineering/Automobile Engineering/Industrial Engineering and Management/Materials Science and Engineering/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/Civil Engineering/Computer Science and Engineering/Computer and Communication Engineering/Electronics and Communication Engineering/Environmental Engineering/Manufacturing Engineering/Marine Engineering/Mechanical Engineering/Mechatronics Engineering/Petrochemical Engineering/Production Engineering/Biotechnology/Petrochemical Technology/Petroleum Engineering/ Electronics and Instrumentation Engineering/Instrumentation and Control Engineering/Aerospace Engineering/Geo-Informatics Engineering/ Aeronautical Engineering)

(Regulations 2017)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions

PART – A                                                    (10×2=20 Marks)

1. Distinguish between "Ambient Air Quality Standards" and "Emission Standards".

2. List the various elements of atmosphere.

3. How to calculate effective stack height ?

4. Define plume rise.

5. Name any four principles by which particulate removal is carried out.

6. What is the impact of SPM in air ?

7. Differentiate adsorption and absorption.

8. When are bio filtration used to control air pollution ?

9. Suggest two important steps to control indoor air quality.

10. What is LN and Leqn ?

PART – B                                                                 **(5×13=65 Marks)**

11. a) Tabulate the ambient air quality standards and mention the objectives. Also Write the steps taken to control air pollution in India.

(OR)

    b) Classify various sources of air pollutants and discuss the control methods for each of them with examples.

12. a) i) Explain the Gaussian Dispersion model and state its application.                    **(7)**

    ii) Compare the plume behaviors under different conditions of atmospheric stability.                                                                 **(6)**

(OR)

    b) i) Explain the importance of meteorology on atmospheric diffusion.              **(8)**

    ii) What are the conditions that determine atmospheric stability ?                      **(5)**

13. a) With a neat sketch explain the principle, construction and working of an electrostatic precipitator along with its advantages and disadvantages.

(OR)

    b) i) A fabric filter has 2000 $m^2$ of filter area and treats $15 m^3$/s of air carrying a dust of concentration 0.015 kg/$m^3$. Assume $K_1$ =25 kPa-s/m and $K_2 = 10^{-5}$ $s^{-1}$. If filter must be cleaned when pressure drop reaches 3.0 kPa, after what period must cleaning occur ?                                                    **(9)**

    ii) Compare the operation and performance of Bag Filters and Electrostatic Precipitator.                                                          **(4)**

14. a) List few air pollution control equipment applied to industrial applications which remove or reduce air pollutants through Combustion, Conversion and Collection and explain the working principle of any two in brief.

(OR)

    b) i) Write a short note about Incineration process and its type.                         **(8)**

    ii) Define adsorption and differentiate between physical and chemical adsorption.                                                                 **(5)**

15. a) Define IAQ. What causes Indoor Air Pollution ? List few Indoor Air Pollutants and their Health Effects. What are the Parameters that affect IAQ ?

(OR)

    b) Discuss in brief the various sources of noise and their typical noise levels, in a modern society. Explain the control and preventive measures undertaken for noise pollution.

PART – C                                                                 **(1×15=15 Marks)**

16. a) Discuss the impact and underlying mechanism of air pollution-related health impairments of metropolitan city residents and suggest an air pollutant control plan for.

(OR)

    b) Explain the causes and impacts of Ozone Layer depletion along with associated control efforts.

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