



# CBCS SCHEME

17CV/CT551

## Fifth Semester B.E. Degree Examination, Aug./Sept.2020 Air Pollution and Control

Time: 3 hrs.

Max. Marks: 100

**Note: Answer any FIVE full questions, choosing ONE full question from each module.**

### Module-1

- 1 a. Define Air Pollution. Explain different categories of air pollutants indicating their sources. (10 Marks)
- b. What is Smog? Discuss its causes and effect. (10 Marks)

OR

- 2 a. Explain the following with respect to air pollution :  
i) Point sources    ii) Area sources    iii) Line sources. (10 Marks)
- b. Illustrate with sketch, the formation of photo chemical smog. (10 Marks)

### Module-2

- 3 a. Explain the effects of air pollution on human health. (10 Marks)
- b. Explain stable, unstable and inversion of the atmosphere. (10 Marks)

OR

- 4 a. Explain the various meteorological factors that influence air pollution. (10 Marks)
- b. A large power plant has a 250m stack with inside radius 2m. The exit velocity of the stack gases is estimated at 15m/s at a temperature of 140°C. Ambient temperature is 25°C and winds at stack height are estimated to be 5m/s. Estimate the effective height of the stack if  
i) the atmosphere is stable with temperature increasing at the rate of 2°C/km.  
ii) the atmosphere is slightly unstable class C. (10 Marks)

### Module-3

- 5 a. What is Isokinetic sampling? Explain preliminary considerations and stages of sampling. (10 Marks)
- b. Explain the gravitational methods of estimating particulate matter. (10 Marks)

OR

- 6 a. Explain the procedure for the collection of suspended particulates by high volume samples. (10 Marks)
- b. Enumerate various analytical methods available for monitoring air pollution. (10 Marks)

### Module-4

- 7 a. With a neat sketch, explain the principle, construction and working of an electrostatic precipitator. (10 Marks)
- b. A cement plant was emitting the gas at the rate of 19500m<sup>3</sup>/h. Assuming the inlet gas velocities of 1.8 m/s. Design a tubular ESP with 0.15 diameter with 7 cylinders to achieve the efficiency of 90% to 95%. (10 Marks)

OR

- 8 a. List the different types of scrubbers and with a neat sketch, explain any one of them. (10 Marks)
- b. Calculate the 50% cutoff diameter for particles of CaO suspended in an airstream at  $100^{\circ}\text{C}$  and at atmospheric pressure for a gravitational settling chamber is 1m/s. 50% cutoff diameter is defined as the particle diameter at which  $\eta_g = 50\%$  (i.e 50% of the particles of this dia, are collected and 50% are lost). (10 Marks)

**Module-5**

- 9 a. Discuss the different control measures adopted to check the air pollutants emitted by automobiles. (10 Marks)
- b. List out the effects of noise pollution. Explain the control and preventive measures of noise pollution. (10 Marks)

**OR**

- 10 a. What is green house effect? Explain briefly the effect of green house on environment. (10 Marks)
- b. What is Acid rain? What are the causes for acid rain? Explain briefly the effects of acid rain on vegetation. (10 Marks)

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