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15CV551

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

Time: 3 hrs.

Max. Marks: 80

**Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.  
2. Assume any suitable missing data.**

### Module-1

- 1 a. Define Air Pollution. Give the composition of clean and dry Air. (08 Marks)  
 b. Classify Air pollution sources along with the examples. (08 Marks)

**OR**

- 2 a. Explain the effects of Air pollutants on : i) Rubber ii) Paper. (04 Marks)  
 b. What are the Primary and Secondary air pollutants? Explain. (04 Marks)  
 c. Elaborate what do you understand by photochemical smog, with chemical reactions. (08 Marks)

### Module-2

- 3 a. Explain Super adiabatic and sub adiabatic stability conditions of the environment. (04 Marks)  
 b. Write about application of Windrose diagram. (05 Marks)  
 c. Determine the plume rise and the effective height of the stack for the following data : (07 Marks)  
     i) Physical stack height = 200m      ii) Inside dia of stack at exit = 1m  
     iii) Wind velocity = 3 m/s            iv) Air Temperature = 25<sup>0</sup>C .  
     v) Barometric pressure = 1000 milli bars      vi) Stack gas velocity = 12m/s  
     vii) Stack gas exit temperature = 150<sup>0</sup>C.

**OR**

- 4 a. List out the meteorological variables. Explain how they are measured? (08 Marks)  
 b. Justify the importance of the following types of plume behaviours : (08 Marks)  
     i) Lofting                      ii) Fumigation.

### Module-3

- 5 a. Describe the sampling methods adopted for collecting Gaseous pollutants. (08 Marks)  
 b. With the aid of neat sketch, elaborate working procedure of High Volume Air samples. (08 Marks)

**OR**

- 6 a. Write the analytical procedure for the measurement of NO<sub>x</sub> in the laboratory. (06 Marks)  
 b. Following are the field data pertaining to determination of suspended particulate matter using High Volume Air Sampler. Calculate the concentration in µg/cum : (07 Marks)  
     i) Final weight of the filter paper = 2.3487g.  
     ii) Initial weight of the filter paper = 3.0886 g.  
     iii) Initial sampling rate = 950 lpm      iv) Final sampling rate = 550 lpm  
     v) Sampling time = 24 hrs. (07 Marks)  
 c. What do you mean by Isokinetic Sampling? (03 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.



**Module-4**

- 7 a. Brief out the construction and working of settling chambers. (08 Marks)  
b. How do you control the generation of air pollutants in general? Explain. (04 Marks)  
c. Elaborate the operating problems that may encounter during operating fabric filters. (04 Marks)

**OR**

- 8 a. A cement plant was emitting at the rate of 20,000 m<sup>3</sup>/h. Assuming inlet gas velocity of 2m/s, design a tubular Electro static precipitator with 0.2m diameter with 7 cylinders to achieve the efficiency of i) 90% and ii) 95%. (08 Marks)  
b. Enumerate the design aspects of cyclone separators along with working principle. (08 Marks)

**Module-5**

- 9 a. Define Noise Pollution. Explain the sources of noise pollution and its control measures. (08 Marks)  
b. Write a note on Montreal Protocol and Kyoto protocol. (08 Marks)

**OR**

- 10 a. What do you mean by Green House effect? What measures will you adopt to control it? (08 Marks)  
b. List out control measures for the Automobile Air Pollution. (04 Marks)  
c. Write a note on Bhopal Gas Tragedy in India. (04 Marks)

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