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Fifth Semester B.E. Degree Examination, Dec.2018/Jan.2019 Air Pollution and Control

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. Define air pollution and briefly explain the various sources of air pollution. (06 Marks)
b. Explain the subsidence inversion and radiation inversions in detail. (06 Marks)
c. What are the effects of photo chemical smog? (04 Marks)

OR

- 2 a. Distinguish between primary and secondary air pollutants with examples. (08 Marks)
b. Explain the effects of air pollutants on human health along with a neat sketch. (08 Marks)

Module-2

- 3 a. Explain the important meteorological parameters that influence air pollution. (08 Marks)
b. Explain the various types of Plume behavior, with a neat sketch showing temperature gradient. (08 Marks)

OR

- 4 a. Explain wind rose with neat sketch in detail. (08 Marks)
b. Calculate the effective stack height from the following data using:
(i) Inner diameter of stack = 0.6 m
(ii) Constructed stack height = 30 m
(iii) Wind velocity = 4 m/sec
(iv) Barometric pressure = 900 millibar
(v) Stack gas velocity = 8.2 m/sec
(vi) Stack gas temperature = 110°C
(vii) Atmospheric air temperature = 23°C (08 Marks)

Module-3

- 5 a. With a neat sketch, describe the methods of gaseous sampling by sampling train. (10 Marks)
b. Write a brief note on indoor air pollution. (06 Marks)

OR

- 6 a. Explain the analysis of following air pollutants:
(i) SO_x (ii) NO_x (iii) CO (08 Marks)
b. The following data were obtained in an ambient air quality monitoring in a residential area. Find the concentration of suspended particulate matter.
(i) Duration of sampling = 8 hrs.
(ii) Initial weight of filter paper = 1.6978 gms.
(iii) Final weight of filter paper = 1.7120 gms.
(iv) Atmospheric temperature = 28°.
(v) Atmospheric pressure = 690 mm of Hg.
(vi) Sampling rate (initial) = 1.4 m³/min.
(vii) Sampling rate (final) = 1.2 m³/min (08 Marks)

Module-4

- 7 a. With a neat sketch, explain the principle, construction and working of an ESP. (10 Marks)
b. Explain with a neat sketch, settling chamber. (06 Marks)

OR

- 8 a. List the different types of scrubbers and explain any one of them with a neat sketch. (10 Marks)
b. Calculate the size of the particle which can be collected in a cyclone having 50% collection from the following data:
(i) Inlet width = 30 cm
(ii) Inlet gas velocity = 3.2 m/sec.
(iii) Particle density = 1.6 gm/cc
(iv) Temperature of gas = 23°C
(v) Dynamic viscosity of gas = 0.181×10 poise at 23°C
(vi) Effective turns = 8. (06 Marks)

Module-5

- 9 a. Briefly discuss the different control measures adopted to check the air pollutants emitted by automobiles. (10 Marks)
b. What is noise pollution? What are sources of noise pollution? (06 Marks)

OR

- 10 a. What is green house effect? Explain briefly effect of green house on environment. (08 Marks)
b. Explain the Bhopal gas Tragedy in detail. (08 Marks)
