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Code No: 127AG

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech IV Year I Semester Examinations, November/December - 2018

AIR POLLUTION AND CONTROL

(Common to CE, CEE)

Time: 3 Hours **Max. Marks: 75**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART- A

(25 Marks)

1.a) What are primary air pollutants? Give two examples. [2]
b) Differentiate point sources and area sources of air pollutants. [3]
c) Explain the causes of inversion of atmosphere. [2]
d) If the temperature of the atmosphere is 16^0C at 40 m, what type of plume would you expect if the stack was 20 m tall and 35 m tall? [3]
e) What are the main principles of pollution abatement? [2]
f) What are the advantages of using collectors in series? [3]
g) What are the sources of odour? [2]
h) Explain NO_x emissions do occur even if the fuel does not contain nitrogen. [3]
i) What is a sample train? [2]
j) Write a short note on dry gas meters. [3]

PART-B

(50 Marks)

2.a) Define air pollution and differentiate between natural and anthropogenic air pollution.
b) What are the effects of acid rain on soil micronutrients and aquatic ecosystems? [5+5]

OR

3. Discuss the photo chemistry of ozone in the upper atmosphere using the pertinent chemical reactions. Discuss the hypothesized effect of chlorofluorocarbons on these reactions. [10]

4. What are the various instruments used for meteorological parameters? Illustrate their working principles with sketches. [10]

OR

5. It is proposed to establish a 750 MW power plant using 4% S coal and 32564 kJ/kg heat content. The plant emits SO_2 at 64860 kg/d from an effective stack height of 250 m. Estimate the ground level concentration of SO_2 at a downward distance of 4 km, if the wind speed at 10 m height is 3.5 m/s on a cloudy summer day. Take σ_y as 359 m and σ_z as 216 m at 4 km distance from the stack. [10]

6. What are the methods available to control air pollution by equipment modification? Illustrate with examples. [10]

OR

7. Enumerate the factors dependent upon the collection efficiency of a cyclone separator? How does the efficiency change from conventional to high efficiency cyclones? [10]

8. What are the different techniques employed to change the NOx emissions without using any additional chemical reactants? [10]

OR

9. What is meant by "in plant control of pollutants"? Explain with the help of examples.[10]

10. What are the devices used for sampling gases and vapours? Describe any one in detail. [10]

OR

11. Explain the following:
a) Gravimetric method of analysis
b) Volumetric method of analysis. [5+5]

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