

M.E. Third Semester (Environmental Engg.) (P.T.) (CBS)
13397 : Air Pollution and Control
3 SCEE 2

P. Pages : 2

Time : Three Hours



AW - 3667

Max. Marks : 80

- Notes :
1. All question carry equal marks.
 2. Answer **three** question from Section A and **three** question from Section B.
 3. Due credit will be given to neatness and adequate dimensions.
 4. Assume suitable data wherever necessary.

SECTION - A

1. a) What are the types and sources of particulate matter causing air pollution ? Briefly explain them. 7
b) Explain the importance of averaging time in air pollution studies. 7
2. a) Identify the various pollution sources of the following air contaminants. 7
i) Sulphur dioxide ii) Hydrogen sulphide
iii) Hydrogen fluoride iv) Carbon monoxide
b) Describe various air pollution sources in an industrialized city. 7
3. a) Explain with sketch the mechanism action of air pollutants on human beings. 6
b) List the air pollutants affecting plants. Briefly explain the various kinds of injury to plants due to air pollutants. 7
4. a) Describe the effect of air pollution on various materials we use, such as rubber, marble, paper, cloth ext. 6
b) What do you mean by air pollution episodes ? Explain any two. 7
5. a) list out the various methods of sampling of particulate pollutants and describe any one in detail. 6
b) Calculate the mass concentration of suspended particulates of the following data : 7
i) Average pressure of the day at station level = 712.59 mm of Hg
ii) Average temperature = 30.6°C or 303.6 abs.
iii) Actual sampling time = 24 h
iv) Sampling rate = Clean filter : 1.6 cum/min
v) Filter after exposure = 1.5 cum/min
vi) Tare weight of filter before and after exposure = 3.417 g and 3.925 g.

SECTION - B

6. a) What is wind rose ? What is the significance of wind rose with respect to air pollution ?

- b) Explain the role of metrological elements, in the dispersion of air pollutants in the atmosphere.
7. A power plant burns 5.45 tonnes of coal per hour and discharge combustion products through a stack that has an effective height of 75 m. The coal has sulphur content of 4.2% and wind velocity at top of stack is 6 m/s. The atmospheric conditions are moderately to slightly unstable. Determine the maximum ground level concentration of SO_2 and distance from the stack at which the maximum occurs.
For $\sigma_z = 53 \text{ m}$ $X_{\text{max}} = 850 \text{ m}$ and $\sigma_y = 88 \text{ m}$ from above data, Determine also the ground level concentration at a distance 3 km downward -
a) At the centerline of the plume and
b) At crosswind distance of 0.4 km on either side of centerline
(Use $\sigma_z = 170 \text{ m}$, $\sigma_y = 280 \text{ m}$)
8. a) What are the guide lines prescribed by the central board for minimum stack height in polluting industries.
b) State the National Ambient Air Quality Standards (NAAQS) prescribed by CPCB.
9. a) With neat sketch, explain the principle, construction working and operation problem of cyclone.
b) Differentiate conventional and high efficiency cyclones.
10. a) Describe considerations in selecting particulate matter removal equipment. Discuss the advantages and limitations for various equipments available.
b) What are the various approaches to minimized exhaust emissions ?
