

RCE-077 (Air & Noise Pollution Control)
UNIT-3 (Assignment Sheet)

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Questions:

1. Highlight the importance of the Tall Stack Dispersion.
2. Describe National Ambient Air Quality Standards (**NAAQS**) of India in detail.
3. Write short note on:
 - i. Particulate Contaminants
 - ii. Gaseous Contaminants
4. Define various air sampling techniques.
5. Describe Stack Sampling.

6. Give the various categories of particulate air pollutants.
7. Discuss sources and effects of various types of particulate air pollutants.
8. Which six mechanisms are responsible for particulate collection?
9. Enlist various particulate removal mechanisms & explain any one in detail.
10. List five basic classes of particulate collection equipment and describe which mechanism of collection is prevalent in each case.
11. Discuss selection criteria for particulate control equipment.

12. Explain the working principle of Gravity Settling Chamber with neat sketch.
13. A multi tray settling chamber having 6 trays including the bottom surface, handles $6 \text{ m}^3/\text{sec}$ of air at 20°C . The trays are spaced 0.25 m apart and the chamber is to be 1 m wide and 4 m long. What is the minimum particle size of density 1500 Kg/m^3 that can be collected with 100% efficiency?
What will be the efficiency of settling chamber if $50\mu\text{m}$ particles are to be removed? Assume μ at $20^\circ\text{C} = 1.81 \times 10^{-5} \text{ Kg/m-s}$.

14. Draw neat sketch of cyclone separator. Label & explain importance of each components of it.
15. List various factors affecting efficiency of cyclone separator.
16. What is the relation of radius of cyclone to centrifugal force?

17. Enlist the cleaning mechanisms of bag filter and explain each in detail with diagram.
18. Define “Air-to-cloth Ratio” & explain Pulse Jet type bag filter with neat diagram.
19. Give no. of filter bags required from the following data:
 - i. Diameter of filter = 0.3 m

- ii. Length of filter = 6 m
 - iii. Flow of air = $10 \text{ m}^3/\text{sec}$
 - iv. Flow velocity to be maintained through filter = 2 m/min
20. Discuss the working of electrostatic precipitator (ESP) with its advantages, disadvantages and applications.
21. Describe the performance parameters of Electrostatic Precipitator and explain each in detail.
22. A plate type electrostatic precipitator for use in cement plant for removing dust particles consists of 12 equal channels. The spacing between plates are 2 m high and 2 m long. The unit handles $10,000 \text{ m}^3/\text{hr}$ of gas. What is the efficiency of collection? What should be the length of the plates for achieving 99% collection efficiency if other conditions are same? Take particulate migration velocity as 0.1 m/sec for pulverized coal fly ash.
23. Describe wet scrubber along with diagram.
24. Enlist various types of wet scrubbers. Write a detail note on cyclonic scrubber.
25. Which scrubber is efficiently removing particulate matter? Draw a neat sketch of that scrubber.
26. Give name of any two wet collectors.
27. What are the advantages of “wet scrubber” over “fabric filters”?