



(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 197405

Roll No.

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B. Tech.

(SEM. IV) THEORY EXAMINATION, 2014-15
AIR POLLUTION AND CONTROL ENGINEERING

Time : 3 Hours]

[Total Marks : 100

- Note :** (i) Attempt **ALL** questions.
(ii) **All** questions carry **EQUAL** marks.

1 Attempt any TWO of the following : (2×10=20)

- Explain composition and structure of atmosphere with the help of diagram.
- Discuss major episodes of air pollution.
- Give sources and effects of gaseous air pollutants.

2 Attempt any TWO of the following : (2×10=20)

- Discuss meteorological aspects of air pollution.
- Discuss various types of temperature lapse rate and atmospheric stability.
- Estimate concentration of sulphur dioxide in $\mu\text{g}/\text{m}^3$ i.e., $\langle P \text{ SO}_2 \rangle$ (1000, 0, 0,200) by given data.
(i) Amount of coal burnt = 8 ton per hour with sulphur content = 0.4%; (ii) $x = 1000$ m; (iii) $A = 0.295$;
(iv) $B = 0.119$; (v) $p = 0.986$; (vi) Average wind velocity, $\bar{u} = 6$ m/s; (vii) $H = 200$ m.

3 Attempt any FOUR of the following: (4×5=20)

- (a) Give note on national ambient air quality standards.
- (b) Discuss any four methods for collection of gaseous air pollutants during ambient air sampling.
- (c) Explain any two methods for collection of particulate air pollutant during ambient air sampling.
- (d) Explain isokinetic sampling.
- (e) Discuss sampling train used during stack sampling.
- (f) Determine settling velocity of particle by given data-Density of Particle, $\rho_p = 2 \times 1.0^3 \text{ kg/m}^3$, Particle Dia. $d_p = 1.2 \mu$, Viscosity of Air, $\mu = 1.85 \times 10^{-5} \text{ k /m.s}$, density of air $\rho_a = 1.2 \text{ kg/m}^3$.

4 Attempt any TWO of the following : (2×10=20)

- (a) Explain working of wet cyclone with the help of diagram. What are its merits and demerits ?
- (b) Discuss working of Spray Tower with the help of diagram along with merits and demerits.
- (c) Determine total number of filter bags required from following data- (i) Filter bags dia = 0.5 m, (ii) Length of filter bags = 6 m, (iii) Air flow to be received =10 m³/s, (iv) filtering velocity to be maintained =1.8 m/min

5 Attempt any TWO of the following : (2×10=20)

- (a) Discuss Absorption and Adsorption for control of gaseous contaminants.
- (b) Explain various strategies for control of sulphur dioxide.
- (c) Give a note on various automotive emission control technologies.