

Total No. of Questions : 4]

SEAT No. :

**P8463**

[Total No. of Pages : 2

**Oct-22/BE/Insem-35**

**B.E. (Civil)**

**AIR POLLUTION AND CONTROL**

**(2019 Pattern) (Semester-VII) (401004A) (Elective - IV)**

*Time : 1 Hour]*

*[Max. Marks : 30*

*Instructions to the candidates:*

- 1) Answer Q1 or Q2, and Q3 or Q4.
- 2) Figures to the right indicates full marks.
- 3) Draw neat figures wherever necessary.

**Q1) a)** Classify air pollutants based on sources and origin with examples. **[4]**

b) Calculate carbon footprint for house in tons per year for the consumption of following resources. **[6]**

Resources	Consumption per year	CO <sub>2</sub> emission factor
Electricity	850 KWh	0.85kg/KWh
Petrol	340 liters	2.296kg/l
Diesel	220 liters	2.653 kg/l
LPG	168kg	2.983 kg/l

c) Explain the important provisions made in Environment (Protection) Act 1986. **[5]**

**OR**

**Q2) a)** List the zones of atmosphere? Explain Troposphere. **[4]**

b) Calculate the carbon footprint in tons per year for a vehicle that has travelled for 50 km per day. The vehicle requires 8.5 liter of petrol for 100 km. Assume the CO<sub>2</sub> emission rate of 2.296 kg/L. **[6]**

c) Define air quality index (AQI) and explain the significance of it. **[5]**

**P.T.O.**

- Q3)** a) Explain radiation and subsidence inversion. [4]
- b) An industry utilizes 0.3 ML (million liters) of oil fuel per month. It has also been estimated that for every 1 ML fuel oil burnt in the factory, per year, the quantities of various pollutants emitted are given as: PM = 2.9 t/yr, SO<sub>2</sub> = 60 t/yr, NO<sub>x</sub> = 8 t/yr, HC = 0.4 t/yr, CO = 0.5 t/yr. Calculate height of chimney required to be provided for safe dispersion of pollutants assuming 300 working days in a year. [6]
- c) Explain Coning plume behaviour with the help of neat sketch. [5]

OR

- Q4)** a) Write the Gaussian model equation and explain each term of it. [4]
- b) A stack in an urban area is emitting 80 g/s of NO. It has an effective stack height of 100 m. The wind speed at stack height is 5.65 m/s. It is a clear summer day with the sun nearly overhead (stability class B).  $\sigma_y = 290$  m,  $\sigma_z = 220$  m. [6]
- Estimate the ground level concentration at:
- i) 2 km downwind on the centreline and
- ii) 2 km downwind, 0.1 km off the centreline
- c) Define stability of the atmosphere. Explain various stability conditions. [5]

