**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 | $CO_2$ 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 $CO_2$ 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, $SO_2$ = 60 t/yr, $NO_x$ = 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]**

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