

Total No. of Questions : 8]

SEAT No. :

PA-1659

[Total No. of Pages : 2

[5927]-336

B.E. (Civil)

AIR POLLUTION AND CONTROL

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

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.
- 2) Figures to the right indicates full marks.
- 3) Draw neat figures wherever necessary.
- 4) Assume suitable data, if necessary.
- 5) Use of scientific calculators is allowed.

Q1) a) State the objectives of ambient air monitoring. **[6]**

b) Convert $80 \mu\text{g}/\text{m}^3$ of SO_2 in ppm. Assume temperature 25°C and pressure at 103.193 kPa. **[6]**

c) Discuss the components of air quality standards. **[6]**

OR

Q2) a) Discuss basis and statistical considerations of sampling sites. **[6]**

b) Convert $120 \mu\text{g}/\text{m}^3$ of SO_2 in ppm. Assume temperature 25°C and pressure at 103.193 kPa. **[6]**

c) Compare national ambient air quality standards, 2009 and WHO air quality guidelines 2021. **[6]**

Q3) a) Explain the role of emission inventory in air quality management. **[6]**

b) Classify air quality models based on time period, pollutant type and level of sophistication. **[6]**

c) State the basic equation of emission estimation and describe its terminologies. **[5]**

OR

Q4) a) Discuss the utilization of emission inventory. **[6]**

b) Deliberate the strengths and limitations of AERMOD model USEPA. **[6]**

c) Explain activity data in emission estimation with examples. **[5]**

P.T.O.

- Q5)** a) Explain the natural self-cleansing properties of environment in respect of air pollution control. [6]
- b) Calculate the minimum size of the particle that will be removed with 100 percent efficiency from gravitational settling chamber under the following conditions. (i) Air: Horizontal velocity - 1.2 m/s, temperature — 75°C (ii) Particle: SP. Gr. — 1.5 (iii) Chamber: Length — 10 m, height — 1.5 m (iv) At 75°C, viscosity of air — 2.1×10^{-5} kg/ms. [6]
- c) Describe the factors responsible for selection of particulate control equipment. [6]

OR

- Q6)** a) State the principle mechanism, advantages and applications of cyclone as a particulate control equipment. [6]
- b) Find the collection efficiency of a horizontal flow, single stage electrostatic precipitator consisting of two sections formed by plates 4 m wide and 6 m high on 25 cm centers, handling a gas flow of 2.5 m³/s. Assume that a migration velocity is 12 cm/s. [6]
- c) Discuss the measures taken to control the emissions from vehicles. [6]

- Q7)** a) List and explain the sources of contaminants in indoor air pollution. [5]
- b) Explain sick building syndrome and its solution. [6]
- c) Discuss the causes and mitigation technologies for indoor air pollution. [6]

OR

- Q8)** a) List and explain the factors affecting indoor air quality. [5]
- b) Discuss the practical considerations using portable and in-duct air cleaners. [6]
- c) Explain the sources and remedial measures to control odour. [6]

