P538

[6004]-460

B.E. (Civil)

AIR POLLUTION AND CONTROL

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

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 side indicate full marks.*
3) *Draw neat figures wherever necessary.*
4) *Assume suitable data if necessary.*
5) *Use of scientific calculators is allowed.*

Q1) a) Explain the purpose of ambient air and stack gas sampling. **[6]**

b) Convert 100 µg/m³ of SO_2 in ppm. Assume temperature 25°C and pressure at 103.193 kPa. **[6]**

c) List the devices and methods used for air pollutant sampling. **[6]**

OR

Q2) a) Explain with a neat sketch location of sampling ports and traverse points in case of stack sampling. **[6]**

b) Convert 140 µg/m³ of SO_2 in ppm. Assume temperature 25°C and pressure at 103.193 kPa. **[6]**

c) Explain with a neat sketch working of high volume sampler. **[6]**

Q3) a) Define emission factor and relate its significance in preparation of emission inventory. **[6]**

b) Describe the steps involved in preparation of gridded emission inventory. **[6]**

c) Compare the physical, statistical and deterministic air quality models. **[5]**

OR

Q4) a) Enumerate and discuss the basic components and importance of air quality modelling. **[6]**

b) State the basic equation of emission estimation and describe its terminologies. **[6]**

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

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Q5) a) Describe the control of air pollution at source by process modification, change of raw material and equipment modification. **[6]**

b) Determine the migration velocity for an existing ESP having collection plate area of 110 m², gas flow rate 2.5 m³/s and collection efficiency 99.5%. **[6]**

c) Explain the measures to be taken to control gaseous air pollutants. **[6]**

OR

Q6) a) State and explain the carbon sequestration. **[6]**

b) Find the collecting plate area and number of plates to be used in a horizontal flow single stage Electrostatic precipitator handling an average gas flow of 2.5 m³/s from a pulverized coal fired boiler. Consider the plate of 4 m wide and 5.2 m high. The required collection efficiency of ESP is 98%. Take the drift velocity as 12 cm/s. **[6]**

c) Describe the factors responsible for selection of particulate control equipment. **[6]**

Q7) a) Relate improved ventilation to indoor air quality. **[5]**

b) Describe the use of plants for control of indoor air pollution. **[6]**

c) Discuss the causes and mitigation technologies for indoor air pollution.**[6]**

OR

Q8) a) Explain sick building syndrome and its solution. **[5]**

b) Explain the radon removal technique. **[6]**

c) Enumerate the odorous materials with respect to following industries.**[6]**

  i) Petroleum

  ii) Pharmaceutical

  iii) Paper and Pulp

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