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SARDAR PATEL UNIVERSITY

M. Sc. (Industrial Chemistry), Second (2nd) Semester Examination
April - 2016

PS02EICH06—Air Pollution Control Technology

Tuesday, 12th April, 2016

Time: 10:30 a.m. to 01:30 p.m.

Total Marks: 70

- Note: i) Attempt all the questions.
 ii) Figures to right indicate full marks.
 iii) Draw neat diagrams wherever it requires.

Q-1 Answer the following Multiple Choice Questions. (08)

- As per NAAQs the annual average of SO₂ concentration in residential area is _____ μgm/m³.
 a) 60 c) 1.0
 b) 80 d) 80
- The NAAQs sampling frequency guideline is typically for 24 hrs at least twice a week making about _____ sample a year.
 a) 104 c) 6
 b) 150 d) 80
- _____ enters the atmosphere and scatters the incoming sunlight.
 a) Organic vapour c) CO₂
 b) Ozone d) Particulate matter
- _____ refers to the dispersion of solid or liquid particles of microscopic size in gaseous media.
 a) Aerosols c) Air-borne
 b) Pollen d) Mists
- _____ refers to visible aerosols in which the dispersed phase is liquid.
 a) Mists c) Smoke
 b) Fog d) Grains
- London smog was caused by _____ combustion during the winter.
 a) atomic c) heavy coal
 b) fossil fuel d) all of these
- Photochemical smog forms primarily as a result of interactions among _____.
 a) sulphur c) nitrogen
 b) phosphorous d) carbon
- A carbon _____ is a measure of the impact our activities have on the environment, and in particular climate change.
 a) Introduction c) footprint
 b) Decline d) Growth

Q-2 Answer the following short questions. Each question carries equal mark. (Any Seven) (14)

1. What is air pollution?
2. List out the air pollutants that affect plants.
3. Write the classification of sampling methods for air pollution.
4. What is the remedy for acid rain?
5. Define: primary meteorological parameter 'Mixing Height'.
6. Write the sulphur dioxide photochemical reaction.
7. What is photochemical smog?
8. When does fanning plume occur?
9. What is stack sampling?

Q-3 (a) What are the effects of air pollution on human health? (06)

Q-3 (b) What is aero allergen? Describe its sources and health effects. (06)

OR

Q-3 (b) Write a note on oxides of nitrogen. (06)

Q-4 (a) Write a note on plume behavior. (06)

Q-4 (b) 1) Discuss atmospheric stability and temperature inversions. (03)

2) Enlist various difficulties encountered during air sampling. (03)

OR

Q-4 (b) Discuss in brief the sampling and analytical technique for SO₂ pollutant. (06)

Q-5 (a) Briefly explain the causes and effects of 'London smog disaster'. (06)

Q-5 (b) 1) Describe the methods to mitigate carbon footprint. (03)

2) Discuss nitrogen dioxide photochemical reaction. (03)

OR

Q-5 (b) Briefly explain the causes and effects of 'Bhopal gas disaster'. (06)

Q-6 (a) Discuss natural and artificial carbon sequestration. (06)

Q-6 (b) 1) Data for SO₂ emission in ppm for UK from 1970 to 2015 are given below. Calculate the mean of SO₂ emission. (03)

Year	1970	1975	1980	1985	1990	1995	2000	2005	2010	2015
SO ₂	100	105	111	119	138	140	100	90	80	75

2) Explain with illustration the distinction between qualitative and quantitative data. (03)

OR

Q-6 (b) 1) Explain with suitable example frequency distribution. (03)

2) The following mass concentrations, q , of PM₁₀ (in $\mu\text{g}/\text{m}^3$) were measured in Los Angeles. Find the mean and standard deviation concentration of PM₁₀. (03)

80.2	105.2	94.2	89.2	94.1	112.4	101.7	83.5	100.2	98.2
96.5	116.1	112.4	97.3	101.5	118.9	100.3	89.0	87.2	84.8