

B.Tech 7th Semester Exam., 2018

AIR POLLUTION ENGINEERING

Time : 3 hours

Full Marks : 70

Instructions :

- (i) The marks are indicated in the right-hand margin.
- (ii) There are **NINE** questions in this paper.
- (iii) Attempt **FIVE** questions in all.
- (iv) Question No. 1 is compulsory.

1. Choose the correct answer (any seven) :

2×7=14

- (a) Ozone is found in
 - (i) mesosphere
 - (ii) ionosphere
 - (iii) stratosphere
 - (iv) exosphere
- (b) The environmental lapse rate is found to be
 - (i) -6.5 °C/km
 - (ii) 8.6 °C/km
 - (iii) 6.5 °C/km
 - (iv) 5.6 °C/km

- (c) The major photochemical oxidant is
 - (i) ozone
 - (ii) hydrogen peroxide
 - (iii) nitrogen oxide
 - (iv) peroxy acetyl nitrate (PAN)
- (d) Which of the following devices is suitable for the removal of gaseous pollutants?
 - (i) Wet scrubber
 - (ii) Cyclone separator
 - (iii) Electrostatic precipitator
 - (iv) Fabric filter
- (e) Which of the following on inhalation dissolves in the blood hemoglobin more rapidly than oxygen?
 - (i) Sulphur dioxide
 - (ii) Carbon monoxide
 - (iii) Ozone
 - (iv) Nitrous oxide
- (f) The ozone hole appears in Antarctica during
 - (i) early winter
 - (ii) peak summer
 - (iii) late winter
 - (iv) autumn

(3)

- (g) The possible substitutes of CFCs are
- (i) HCFs
 - (ii) ODSs
 - (iii) Halons
 - (iv) All of the above
- (h) The greenhouse effect causes
- (i) cooling of the earth
 - (ii) warming of the earth
 - (iii) Both (i) and (ii) depending upon the season
 - (iv) None of the above
- (i) The international treaty which aims at reducing global warming is
- (i) Montreal Protocol
 - (ii) Kyoto Protocol
 - (iii) Ramsar Convention
 - (iv) CITES
- (j) Longer exposure to NO_2 even in small concentrations may cause disease pertaining to
- (i) liver
 - (ii) kidneys
 - (iii) lung
 - (iv) heart

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(Turn Over)

(4)

2. (a) What is Ozone Hole? Discuss the causes, effects and solution for the problem. 7
- (b) What is greenhouse effect? Discuss the impact of greenhouse gases on climate change. 7
3. (a) Define air pollution. What are the harmful effects of carbon monoxide on human being, plants and materials? 7
- (b) Briefly discuss different control measures adopted to check the air pollutants emitted by automobiles. 7
4. Explain different environmental lapse rates and their effects on dispersion of air pollutants. 14
5. With neat sketch, explain the principle, construction and working of fabric filter. Explain the various methods of cleaning a fabric filter. Also, write the advantage and disadvantage of fabric filter. 14
6. (a) Describe with a neat sketch, the principle and working of a wet scrubber. What are the advantages of 'wet scrubbers' over 'fabric filters'? 7

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(Continued)

(5)

- (b) Discuss the emission standards for air quality management. 7
7. Explain in detail the working of high volume sampler with a neat sketch. 14
8. What do you mean by automobile pollution. Describe suitable methods for minimization of exhaust and evaporative emission from automobiles. 14
9. Write short notes on (any four) : $3\frac{1}{2} \times 4 = 14$
- (a) Inversion
 - (b) Wind rose
 - (c) Catalytic converter
 - (d) Harmful effects of SO_x
 - (e) PM₁₀ and PM_{2.5}
