

B.Tech 1st Semester Exam., 2015

ENVIRONMENTAL SCIENCE

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) The primary air pollutants are
  - ~~(i)~~ sulphur dioxide and nitrogen oxide
  - (ii) ozone and carbon monoxide
  - (iii) sulphur dioxide and ozone
  - (iv) nitrogen oxide and ozone
- (b) Electrostatic precipitator is used as pollution controller for the separation of
  - (i) SO<sub>2</sub>
  - ~~(ii)~~ NO<sub>x</sub>
  - (iii) hydrocarbon
  - (iv) particulate matter

- (c) The most common cause of acidity in water is
  - ~~(i)~~ CO<sub>2</sub>
  - (ii) O<sub>2</sub>
  - ~~(iii)~~ H<sub>2</sub>
  - (iv) N<sub>2</sub>
- (d) The process in which chlorination is done beyond the breakpoint is
  - (i) pre-chlorination
  - (ii) post-chlorination
  - (iii) super-chlorination
  - (iv) breakpoint chlorination
- (e) The process of corrosion is enhanced by
  - (i) air and moisture
  - (ii) electrolytes in water
  - (iii) metallic impurities and gases like CO<sub>2</sub> and SO<sub>2</sub>
  - ~~(iv)~~ All of the above
- (f) Pollutant is
  - ~~(i)~~ undesirable foreign matter
  - (ii) desirable foreign matter
  - (iii) required foreign matter
  - (iv) useful foreign matter

- (g) Smog is mixture of fog and  
 (i) gases  
 (ii) smoke  
 (iii) pollutants  
 (iv) oxides
- (h) From the following, identify the metal which cannot pollute environment  
 (i) As  
 (ii) Pb  
 (iii) Pt  
 (iv) Hg
- (i) Effect of increasing CO<sub>2</sub> in air is  
 (i) heating  
 (ii) cooling  
 (iii) increasing pollution  
 (iv) None of the above
- (j) The depth, in soil below which soil particles are filled with water only, is known as  
 (i) water table  
 (ii) water layer  
 (iii) water quantity  
 (iv) depth of water

2. (a) Define water pollution. Describe different kinds of water pollution and their ecological effects on aquatic life and also on man. 7
- (b) Discuss control of water pollution. Distinguish between point and non-point sources of water pollution. What are major water pollutants and what effect do they have on water quality? 7
3. (a) What are air pollutants? Define air pollution. List five air pollutants commonly released in air. How air pollution affects the life on earth? 4
- (b) Discuss indoor air pollutants with their harmful effects. 3
- (c) Describe briefly how air pollution can be checked. Describe electrostatic precipitator with a neat sketch, with respect to its principle, and mode of operation. 7
4. (a) Define solid waste. Discuss the classification of solid wastes. 3

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- (b) Mention the most significant property of the city refuse which guides the adoption of each of the following methods of refuse disposal : 4
- (i) Incineration
  - (ii) Sanitary landfill
  - (iii) Composting
- (c) Explain the term composting. Give the different types of composting in use, and describe with the aid of sketches, their working. 7
5. (a) Define noise and explain as to how and why it should be regarded as an environmental pollutant. 4
- (b) Mention typical values of acceptable sound levels as per IS code for the following : 4
- (i) Rural areas
  - (ii) Urban residential areas
  - (iii) City areas
  - (iv) Industrial areas
- (c) Differentiate between continuous noise, intermittent noise and the impulse noise. Explain in brief the major factors and actions that may help in noise abatement in a modern society. 6

( Turn Over )

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6. (a) What do you mean by groundwater? Briefly mention the various zones of groundwater, and point out the importance of the zone of saturation in this connection. 5
- (b) Differentiate between confined and unconfined aquifers. 3
- (c) What are the pollutants, which cause groundwater pollution? Discuss the various mechanisms by which pollutants get transported within. How can groundwater pollution be controlled? 6
7. (a) Differentiate between renewable and non-renewable energy sources. Give suitable examples. 3
- (b) With a suitable sketch, describe the thermal energy generation process. 4
- (c) Describe thermodynamic laws of energy. Give a detailed note of solar energy trapping and its applications. 7
- ~~8.~~ (a) Define soil and give a neat sketch of soil profile. Give classification of Indian soils. 5
- (b) Discuss desertification and its causes. Describe food problems in India. What are the main causes of food shortage in India? How can food crisis be prevented? 9

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( Continued )

9. (a) Describe the salient features of Environmental Protection Act, 1986. 4
- (b) What do you understand by ecosystem? Describe the various components of an ecosystem, giving suitable example. 5
- (c) Describe toxicological chemistry. Discuss different toxic materials and their effects on human health. 5

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