(b) Discuss incineration process mentioning advantages and disadvantages.

(c) What is meant by noise exposure index? Give an expression mentioning the terms involved.

(d) Various effects of noise pollution on human being.

3 + (1 + 2) + (1 + 2) + 3 = 12

9. (a) What is meant by hazardous wastes? Discuss briefly about their effects on Environment.

(b) How does sanitary land filling differ from open dumping?

(c) What is noise threshold limit value? What is the difference between noise and sound?

(d) Calculate the intensity of 101dB sound. (Reference intensity $= 1 \times 10^{-12}$ W/m^2).

(2 + 2) + 3 + (1 + 2) + 2 = 12

ENVIRONMENTAL SCIENCES
(EVSC 2016)

Time Allotted : 3 hrs **Full Marks : 70**

Figures out of the right margin indicate full marks.

Candidates are required to answer Group A and
any 5 (five) from Group B to E, taking at least one from each group.

Candidates are required to give answer in their own words as far as practicable.

Group – A
(Multiple Choice Type Questions)

1. Choose the correct alternative for the following: **10 × 1 = 10**

   (i) Which gas out of following is found highest by volume in Air?
   (a) Carbon di oxide   (b) Nitrogen
   (c) Methane   (d) Oxygen.

   (ii) Which of the following can be used for disinfection of water?
   (a) Bleaching powder   (b) Hydrogen peroxide
   (c) Blue vitriol   (d) potassium permanganate.

   (iii) Which method kills the pathogen
   (a) incineration   (b) secure landfill
   (c) open dumping   (d) sanitary landfill.

   (iv) The attribute of population growth is
   (a) birth rate   (b) immigration rate
   (c) emigration rate   (d) none of these.

   (v) The best method of disposal of clinical wastes
   (a) open dumping   (b) sanitary land filling
   (c) incineration   (d) composting.

   (vi) The components of environmental auditing are
   (a) assessment   (b) verification
   (c) the audit process   (d) all of the above.

   (vii) The unit of intensity of sound is
   (a) watt/m^2 (b) N/m^2
   (c) decibel   (d) none of these.

(viii) The saturated value of DO is approximately
(a) 9 mg/l (b) 5 mg/l
(c) 20 mg/l (d) 6 mg/l.

(ix) Itai-Itai disease is associated with
(a) mercury (b) arsenic
(c) cadmium (d) lead pollution.

(x) The coldest region of the atmosphere is
(a) mesosphere (b) thermosphere
(c) troposphere (d) stratosphere.

Group – B

2. (a) Define environment. Mention the main factors of environment.

(b) Following logistic growth of population, derive the expression for logistic growth rate constant $r = \frac{1}{t^*} ln\left(\frac{K}{N_0}-1\right)$ where, all the terms have their usual meaning.

(c) Write short note on "Bhopal gas tragedy".

(d) Write the various aspects of Environmental Impact Assessment.
$$(1 + 2) + 3 + 3 + 3 = 12$$

3. (a) Prove that, when population follows logistic function then the maximum sustainable yield will be obtained when population is half the carrying capacity.

(b) Define renewable and non-renewable resources with examples.

(c) What is sustainable development? Explain the effect of excessive use of natural resources on sustainable development.

(d) What are the main objectives of Environment Protection Act, 1986 of India?

(e) What is homeostatic mechanism related to natural environment.
$$3 + 2 + (1 + 2) + 3 + 1 = 12$$

Group – C

4. (a) On the basis of global temperature model (including earth's ALBEDO), prove that the earth's surface temperature is -19 °C.

(b) Write down the differences between photochemical smog and sulphurous smog.

(c) Deduce the chemical formula of CFC-11.

(d) Write short note on (i) Bag house filter (ii) Secondary pollutant.
$$3 + 3 + 2 + (2 + 2) = 12$$

5. (a) How acid rain is formed? What is the effect of acid rain on terrestrial ecosystem?

(b) Deduce the chemical formula of CFC-113.

(c) Why thermosphere and magnetosphere are so hot?

(d) What are criteria pollutants? What is the difference between pollutants contaminants?
$$(3 + 2) + 2 + 2 + (2 + 1) = 12$$

Group – D

6. (a) Write down the sources of generation of Cadmium (Cd) in water and describe its biochemical effects.

(b) Prove that $BOD_t = C_0(1-e^{-kt})$ where, C_0 is the initial concentration of dissolved oxygen, k is the rate of degradation of organic waste and t is the time period. What is the necessity of a 5-day BOD test?

(c) What do you mean by thermal pollution in water? Write down the effects of thermal pollution of water?
$$(1 + 2) + (3 + 2) + (1 + 3) = 12$$

7. (a) What do you mean by hardness of water and how does it affect the water quality?

(b) What are the various processes involved in surface water treatment?

(c) What are the sources of Hg contamination in water? Write down the biochemical effects of Hg?

(d) What are pestrisides? Why are they so dangerous for living organisms?
$$(1 + 2) + 3 + (1 + 2) + (1 + 2) = 12$$

Group – E

8. (a) What are the major sources of land pollution?