Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/MCA/SEM-4/HU (MCA)-401/2011

2011

ENVIRONMENT & ECOLOGY

Time Allotted : 3 Hours *Full Marks :* 70

The figures in the margin indicate full marks.

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

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following : $10 \times 1 = 10$

   i) Air pollutant, which reduces oxygen carrying capacity of haemoglobin, is

      a) carbon monoxide

      b) ammonia

      c) hydrogen sulphide

      d) none of these.

   ii) The decomposers could be

      a) amoeba b) fungi

      c) earthworm d) all of these.

iii) Earth hour is celebrated to create consciousness about

a) water pollution b) noise pollution

c) global warming d) deforestation.

iv) The saturated value of DO is approximately

a) 9 mg/L b) 20 mg/L

c) 6 mg/L d) 5 mg/L.

v) The noise threshold limit value of sound level 110 dB is

a) 30 minutes b) 15 minutes

c) 2 hrs d) 8 hrs.

vi) Ozone is an essential component of

a) troposphere b) stratosphere

c) mesosphere d) ionosphere.

vii) In a seeded BOD test the dilution water contains

a) distilled water

b) distilled water containing some microorganisms

c) distilled water containing some waste

d) none of these.

viii) Minamata disease occurs due to

a) arsenic pollution

b) lead pollution

c) mercury pollution

d) cadmium pollution.

ix) Which of the following can be used for disinfection of water ?

a) Ozone b) Hydrogen peroxide

c) Chlorine d) None of these.

x) Blue baby syndrome is related to

a) nitrate b) sulphate

c) phosphate d) carbonate.

xi) Biotic factor of ecosystem is

a) plants & animals b) solar energy

c) temperature d) soil.

xii) Incineration is a disposal method of

a) water pollutants b) solid wastes

c) air pollutants d) none of these.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. Define environment. How are environmental components classified ?

3. Define the term 'ecology'. Describe oxygen cycle.

4. Name two hazardous chemicals present in waste water. Write down their source and biochemical effects.

5. What is greenhouse effect ? How does it affect global warming ?

6. What do you mean by hardness of water ? Can hard water be used in boilers and laundries ?

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

7. a) What is noise pollution ? Discuss the adverse effects of noise on human health. 1 + 2

   b) Define noise threshold limit value. 2

   c) In a work area the noise levels are read as 95 dBA for 2 hrs a day, 90 dBA for 4 hrs a day, 80 dBA for remaining 2 hrs a day and permissible duration of each noise level is 95 dBA for 2 hrs, 90 dBA for 4 hrs and 80 dBA for 16 hrs. Find out the noise threshold limit value and predict whether the noise level is within permissible limit or not. 5

   d) Briefly explain control measures at receiver's end to reduce noise pollution. 5

8. a) Name four air pollutants emitted from IC engine. 3

b) Why do CO is taken as major air pollutant ? What is its source ? Write its effect on living being. How can its emission be controlled ? 2 + 2 + 2 + 2

c) Compare photochemical smog and London smog. 4

9. a) Define "Energy Flow" in eco-systems. In an eco-system, although the inorganic nutrients are recycled, the flow of energy is not. Justify. 1 + 3

b) State the composition of lithosphere. Mention the different types of solid wastes. 2 + 2

c) Write down the disadvantages of Land-filling. 2

d) Define the terms Habitat, Population, Bio-community, Ecological Niche and Species. 5

10. a) What is Biochemical Oxygen Demand (BOD) ? 2

b) State the importance of adding azide in water samples before estimation of BOD. 3

c) Derive the equation

$$\text{BOD}_w = \frac{\left(DO_i - DO_f\right) - \left(B_i - B_f\right)(1 - P)}{P}$$

where, DO_i = initial dissolved oxygen of the mixture of waste water and seeded dilution water

DO_f = final dissolved oxygen of the mixture of waste water and seeded dilution water after 5 day period

B_i = Initial dissolved oxygen in the seeded dilution water (Blank)

B_f = Final dissolved oxygen in the seeded dilution water (Blank). 5

d) Why is the value of COD greater than the value of BOD for a given water sample ? Why is the value of BOD less than theoretical oxygen demand ? 2 + 3

11. Write short notes on any *three* of the following : 3 × 5

a) Confined and unconfined aquifer

b) Mufflers

c) Harmful effects of CO and SO_2

d) Catalytic converter

e) Ecological balance and instability.