

B.Tech/BT/CHE/CSE/IT/3rd Sem/CHEM-2001/2015

2015

BASIC ENVIRONMENTAL ENGINEERING AND ECOLOGY
(CHEM 2001)

Time Alloted : 3 Hours

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 alternatives for the following : [10×1=10]
- i) The coldest region of atmosphere is
(a) Troposphere (b) Stratosphere
(c) Mesosphere (d) Thermosphere
- ii) Air pollutant which reduces the oxygen carrying capacity of haemoglobin is
(a) oxygen (b) nitrogen
(c) carbon monoxide (d) sulphur di oxide
- iii) Minamata disease is associated with
(a) mercury (b) lead
(c) cadmium (d) arsenic

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- iv) Which of the following is not biodegradable?
(a) polythene (b) cotton
(c) vegetable waste (d) wood
- v) Incineration is a disposal method of
(a) solid waste (b) air pollutants
(c) water pollutants (d) none of these
- vi) Nitrification means conversion of
(a) N_2 to NO_3^- (b) NH_4^+ to N_2
(c) NO_2^- to NO_3^- (d) NH_4^+ to NO_3^-
- vii) The unit of loudness of noise is
(a) meter (b) candela
(c) newton (d) decibel
- viii) Temporary hardness of water is due to the presence of
(a) Cl^- (b) SO_4^{2-}
(c) PO_4^{3-} (d) HCO_3^-
- ix) In parasitic food chain the nature of pyramid is
(a) upright
(b) inverted
(c) can be upright and inverted
(d) none of these
- x) Medha Patekar is related with
(a) Narmada Bachao Andolan
(b) Ganga Bachao Andolan
(c) Cauvery Bachao Andolan
(d) None of the Above

GROUP - B

2. (a) What is maximum sustainable yield? Prove that maximum sustainable yield following logistic growth of population is $(dN/dt)_{\max} = rK/4$, the terms have their usual meaning.

(b) What is sustainable development?

(c) Briefly discuss with example in situ and ex situ conservation of biodiversity.

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

3. (a) Define food chain. Discuss grazing food chain with example. Write nitrogen cycle with diagram.

(b) What are symbionts? Give example.

$$(2+3+4)+(2+1) = 12$$

GROUP - C

4. (a) What is global warming? What are the steps necessary to control global warming? What is atmospheric radiation window?

(b) Show that for unit mass of air the temperature of the atmosphere falls by a rate $r = -g/C_p$

where, r = rate of change of temperature with altitude;
 g = gravitational acceleration; C_p = specific heat at constant pressure.

$$(2+3+3)+(4) = 12$$

5. (a) Distinguish between photochemical smog and sulphurous smog.

(b) What are the causes and effects of ozone layer depletion? What is the importance of the 'Montreal protocol'?

(c) Which device is used for control of emissions from automobile engine? How does it control emissions?

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

Group - D

6. (a) What is 'eutrophication'? How eutrophication can be controlled?

(b) Write differences between BOD and COD method.

(c) Discuss the sources and biochemical effects of mercury pollution in water.

(d) Discuss the harmful effects of noise pollution on human being.

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

7. (a) Discuss the sequential method of waste water treatment.

(b) What is the difference between sound and noise?

(c) What is noise threshold limit value? Define L_{10} (18 hrs) noise index and equivalent perceived noise level.

$$5+2+(1+2+2) = 12$$

GROUP - E

8. (a) What do you mean by solid waste management? How can the waste be reduced and reused to cut off waste treatment cost?

(b) Give a brief account of different types of hazardous wastes mentioning their sources.

(c) Write a short note on Chernobyl Disaster.

$$(2+4)+(3)+(3) = 12$$

9. (a) What are carcinogen, teratogen and mutagen? What are the concepts of green catalyst and green solvents in chemical reaction?

(b) Give a brief idea of Environment Impact Assessment(EIA).

$$(2+2+2+1+1)+4 = 12$$