

Name :
Roll No. :
Invigilator's Signature :

CS/B.Tech(NEW)(ECE/EE/EEE/EIE/ICE/PWE/BME)/SEM-4/CH-401/2012

2012

**BASIC ENVIRONMENTAL ENGINEERING &
ELEMENTARY BIOLOGY**

Time Allotted : 3 Hours

Full Marks : 70

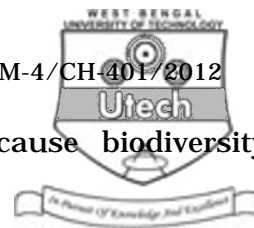
The figures in the margin indicate full marks.

*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 × 1 = 10
- i) Which one of the following is a renewable source of energy ?
 - a) Thermal
 - b) Hydroelectric
 - c) Nuclear
 - d) Solar.
 - ii) Ozone is a pollutant when present in
 - a) stratosphere
 - b) troposphere
 - c) mesosphere
 - d) ionosphere.
 - iii) The unit of intensity level of noise is
 - a) metre
 - b) candela
 - c) newton
 - d) decibel.
 - iv) A greenhouse gas is
 - a) CO
 - b) H₂S
 - c) SO₂
 - d) H₂O-vap.
 - v) Which of the following is an example of *in situ* conservation ?
 - a) Deer park
 - b) Seed bank
 - c) Wildlife sanctuary
 - d) Aquarium.



- vi) Which of the following does not cause biodiversity loss ?
- Habitat destruction
 - Creating safari parks
 - Introduction of new species
 - Trading on living beings.
- vii) Montreal Protocol is adopted to reduce
- greenhouse gas emission
 - ozone depletion
 - automobile emission
 - deforestation.
- viii) There are two samples of waste water. Sample-I has BOD 300 mg/l and Sample-II has BOD mg/l,
- the degree of pollution is same in both the samples
 - sample-I is more polluted than Sample-II
 - sample-II is more polluted than Sample-I
 - no inference can be drawn on the degree of pollution.
- ix) Sulfur cycle is
- hydrologic cycle
 - gaseous cycle
 - sedimentary cycle
 - none of these.
- x) Temporary hardness of water is due to the presence of
- NO_3^-
 - SO_4^{2-}
 - Cl^-
 - HCO_3^- .
- xi) Methyl isocyanate can be called
- contaminant
 - pollutant
 - both contaminant and pollutant
 - none of these.
- xii) The law of minimum is proposed by
- Woodbury
 - Odum
 - Krebs
 - Liebig.



GROUP - B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. What is photochemical smog ? Briefly describe the formation mechanism of PAN. $2 + 3$
3. Explain on the various causes of flood and landslide. $2 + 3$
4. Write down the phosphorus cycle in nature with the help of suitable diagram.
5. Discuss in detail the structure, function and importance of mangrove ecosystem.
6. Name two hazardous chemicals present in waste water. Write down their source(s) and biochemical effects. $1 + 4$

GROUP - C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. a) What do you by environmental degradation ? What is aerosol ?
b) Give a view on EIA.
c) Define food chain. State the principal types of food chain with example.
8. a) What is bio-diversity ? Discuss various conservation methods in brief.
b) Describe various modes of downstream self-purification of a river from a waste disposal site.
c) Explain how CFC decreases ozone concentration in the stratosphere. $(5 + 2) + 4 + 4$
9. a) What is meant by hardness of water ?
b) Can hard water be used in boilers or in laundries ? Justify your answer.
c) Discuss the sequential methods of raw water treatment.



- d) A sample of ground water has 140 mg/litre of Ca^{2+} ions. Express its hardness in units of mg/litre of CaCO_3 .
- e) State Darcy's law.
- f) What do you mean by water softening? What are the methods of water softening? 1 + 2 + 4 + 2 + 1 + 5
10. Write short notes on any *three* of the following : 3 × 5
- Montreal Protocol
 - Acid rain
 - Advantages & disadvantages of cyclone separator and beghouse
 - Logistic model for estimation of population
 - Adverse effects of nuclear pollution.
11. a) Define BOD and COD.
- b) Discuss the principle of 5 days BOD test.
- c) Prove that, the relation $\text{BOD}_t = C_0 (1 - e^{-kt})$ where the terms indicates their usual meaning. 5 + 5 + 5
12. a) What are the objectives of environmental management? What are the steps involved in it?
- b) How environmental audit is done? What is its utility?
- c) Compare and contrast the advantages of 'activated sludge' and 'trickling filter'.
- d) What is solid waste management? Discuss the effect of noise pollution on public health. 4 + 4 + 4 + 3