CS/B.TECH/EE/ECE/EIE/EEE/ICE/PWE/BME/EVEN/
SEM-4/CH-401/2018-19

MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY, WEST BENGAL
Paper Code : CH-401
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) The value of EIU is

      a) EQI × PIU   b) EQI + PIU

      c) EQI – PIU   d) EQI / PIU.

   ii) Which of the following is likely to be present in photochemical smog ?

      a) Alcohol   b) Aldehyde

      c) Acetone   d) Ether.

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iii) Niche refers to

    a) Habitat of a number of aquatic species

    b) Habitat of a number of land species

    c) Habitat of a single species

    d) None of these.

iv) The best method for disposal of non-hazardous solid waste is

    a) open dumping   b) sanitary land filling

    c) incineration   d) composting.

v) Tree hugging movement is

    a) silent valley movement

    b) green movement

    c) Chipko andolan

    d) none of these.

vi) DO_{min} for aquatic life is

    a) 3 ppm   b) 1 ppm

    c) 7 ppm   d) 5 ppm.

vii) In road traffic area, noise is measured by

    a) L_{eq} b) L_{10} (18 hours index)

    c) $L_e P_n$ d) none of these.

viii) An air pollutant that reduces oxygen carrying capacity of hemoglobin is

  a) ammonia   b) hydrogen sulfide

  c) carbon monoxide   d) carbon dioxide.

ix) Ozone is a pollutant when present in the

  a) troposphere   b) stratosphere

  c) mesosphere   d) thermosphere.

x) Pollutant that affects the oxygen transport blood is

  a) CO_2 b) SO_2

  c) CO   d) Hydrocarbons.

xi) Which of the following does not cause biodiversity loss ? http://www.makaut.com

  a) Habitant destruction

  b) Introduction of genetically modified new species

  c) Trading on living organism

  d) None of these.

xii) The demarcation line between crust and mantle is

  a) Conrad discontinuity

  b) Moho discontinuity

  c) Gutenberg discontinuity

  d) None of these.

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GROUP – B

(Short Answer Type Questions)

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

2. Write what do you meant by : Aquifer, Hydraulic Gradient and Darcy's law. $1 + 2 + 2$

3. What do you understand by carrying capacity and maximum sustainable yield ? Prove that $N = K/2$ for maximum sustainable yield.

4. Define the term EIA. The following data are given in a dam construction project :

Parameter	Original value	Present value
SPM	120µg/cc	100000 µg/cc
TDS	100 mg/L	20000 mg/L
DO	8 mg/L	3 mg/L
Noise level	40 dB	120 dB

Find out the total EIU value considering the parameter importance unit as 4, 3, 2 and 4 respectively for the parameters mentioned above.

$1 + 4$

5. Noise in an area measures 90 (dBA) for two hours, 80 (dBA) for 3 hours and 75 (dBA) for 1 hour. Find out whether the permissible limit has exceeded or not and also state if the condition is good for the health of a worker or not. Given the permissible duration for each noise level is 90 (dB) for 4 hours, 80 (dBA) for 16 hours and 75 (dBA) for any period of time.

6. Using global temperature model how can we find the average temperature of earth surface ?

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GROUP – C

(Long Answer Type Questions)

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

7. a) Explain Stack and Plumes.   3

    b) How many types of plumes can be observed ?   3

    c) How does Antarctica ozone hole formation take place ? What is its impact ?   5

    d) What do you understand by earth albedo ?   4

8. a) Describe activated sludge process for treatment of waste water.   5

    b) What do you mean by biotreatability ? Discuss the advantages of Biological Towers over conventional Trickling filters. $1 + 4$

    c) If the 5-day, 20°C BOD of waste water is 210 mg/L, what will be the ultimate BOD and 10-day BOD ? Had the sample been incubated at 30°C, what would the 5-day BOD have been ? (Given : $k_1 = 0·23$/day, $\theta = 1·047$)   5

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9. a) Discuss the hydrological cycle showing the water balance of the Earth. What role is played by man in the hydrological cycle ?   4 + 1

b) Distinguish between an aquifer and an aquitard.   2

c) State Darcy's law for groundwater flow and also define hydraulic conductivity.   2 + 2

d) A confined aquifer 30 m thick has two monitoring wells placed 600 m apart along the direction of groundwater flow. The difference in piezometric head in the wells is 2·0 m. The hydraulic conductivity is 50 m/day. Calculate the flow rate per metre of distance perpendicular to the flow.   4

10. a) What is BOD ?   2

b) Define Eutrophication.   3

c) What is the difference between BOD and COD method ? http://www.makaut.com   5

d) A BOD test is run using 50 ml of wastewater mixed with 100 ml of pure water. The initial DO of the mixture is 8·0 mg/L, and after 5 days it becomes 3·0 mg/L. After a long time, the DO remains fixed at 1·0 mg/L.

i) What is BOD_5 of waste water ?

ii) What is the ultimate BOD ?

iii) What is the remaining BOD after 5 days ?

iv) What is the reaction rate constant measured at
20°C ? 5

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

a) Arsenic pollution

b) Catalytic converter

c) Montreol Protocol

d) Biodiversity

e) Weathering.