

M. Sc. Environmental Science
FIRST SEMESTER
ENVIRONMENTAL CHEMISTRY
MEV - 102

Duration: 3 Hrs.

Marks: 70

PART : A (OBJECTIVE) = 20
PART : B (DESCRIPTIVE) = 50

[PART-B : Descriptive]

Duration: 2 Hrs. 40 Mins.

Marks: 50

[Answer question no. One (1) & any four (4) from the rest]

1. What do you mean by Green Chemistry? Write about the principles of Green Chemistry. 4+6 = 10
2. What are different water quality parameters? Write about sources, impacts and measurements of hardness and alkalinity of water. 2+8 = 10
3. Write the reactions of Ozone formation and Ozone depletion in the Stratosphere. What are Freons? Why are they significant? 5+2+3 = 10
4. What is acid deposition? What are the causes? What are the impacts of acid rain on environment? 2+2+6 = 10
5. What do you mean by soil structure? Write about the other physico-chemical properties of soil. 2+4+4 = 10
6. Tests for common ions are run on a sample of water and the results are shown below.
Ca²⁺ = 98 mg/L
Cl⁻ = 89 mg/L
HCO₃⁻ = 317 mg/L
Mg²⁺ = 22 mg/L
Na⁺ = 71 mg/L
SO₄²⁻ = 125 mg/L
(C) What is the percent error in the cation-anion balance?
(D) Draw a bar diagram for the water. 6+4 = 10
7. What are soaps and detergents? Write about their cleaning mechanisms. What are the differences between soaps and detergents? 2+3+5 = 10
8. Write short note on (any two) 5x2= 10
 - d) Beer Lambert law
 - e) Biochemical Oxygen Demand
 - f) Application of Bragg's law in XRD

M. Sc. Environmental Science
FIRST SEMESTER
ENVIRONMENTAL CHEMISTRY
MEV - 102
[PART-A : Objective]

Choose the correct answer from the following :

1×20 = 20

- Photochemical smog was first discovered in
 - London
 - Paris
 - Los Angeles
 - New Delhi
- Maximum density of water is at
 - 0 °C
 - 4 °C
 - 100 °C
 - 273 °C
- The conjugate acid of HF is
 - H₂F⁺
 - F⁻
 - HF₂⁻
 - F⁺
- Which is called atmospheric detergents
 - Cl⁻ radical
 - OH radical
 - Bleaching powder
 - Ozone
- Trace metals are determined by
 - HPLC
 - AAS
 - Flame photometry
 - None of above
- Beer Lambert law defines
 - Degree of absorption of light by a homogeneous medium
 - AAS
 - Both the above
 - None of above
- Amount of water present in rivers of the globe
 - 70%
 - 2.4%
 - 0.001%
 - 0.0001%
- COD is always
 - Equal or higher than BOD
 - Equal to BOD
 - 1.8 times of BOD
 - Lower than BOD
- If an acid is strong, its conjugate base will be
 - Strong
 - Weak
 - Can not be determined
 - Depend upon the chemical structure
- Which of the following is capable of functioning both as a Bronsted acid and Bronsted base
 - F⁻
 - CO₃²⁻
 - HS⁻
 - S²⁻
- Ozone is a powerful oxidant, it oxidizes most metals and non-metals except
 - Platinum
 - Gold
 - diamond
 - Both Platinum and Gold
- When a solid melts, there is
 - No change in enthalpy
 - No change in entropy
 - Decreasing in enthalpy
 - Increasing in enthalpy
- The halogens exhibit the oxidation number from
 - 2 to +6
 - 1 to +7
 - 3 to +4
 - 1 to +1
- The active mass (for a substance A) is usually denoted by
 - A
 - (A)
 - [A]
 - <A>

UNIVERSITY OF SCIENCE & TECHNOLOGY, MEGHALAYA



[PART (A) : OBJECTIVE]

Duration : 20 Minutes

Serial no. of the main Answer sheet

Empty box for serial number

- 15. Which is at the upper layer of soil
a. A horizon
b. B horizon
c. O horizon
d. R horizon
16. Loamy soil contains
a. 40% silt, 40% sand, 20% clay
b. 50% silt and sand, 50% clay
c. 50% sand, 25% silt, 25% clay
d. None of above
17. Chemical formula of PAN is
a. RCO5N
b. RCOON2
c. RCOONa
d. None of above
18. Which of the following is true regarding solubility of gases in water
a. Solubility does not depend upon the temperature
b. Liquified gases are difficult to dissolve in water
c. A saturated solution can dissolve more solute
d. Increase in temperature after a certain level inhibits dissolving reaction
19. The chemical composition of CFC-11 is
a. CCl3F
b. CCl2F2
c. CClF3
d. None of the above
20. Hardness is commonly measured in terms of
a. CaSO4 equivalents
b. CaCO3 equivalents
c. MgSO4 equivalents
d. MgCO3 equivalents

==***==

Course :

Semester : Roll No :

Enrollment No : Course code :

Course Title :

Session : 2017-18 Date :

.....

Instructions / Guidelines

- > The paper contains twenty (20) / ten (10) questions.
> Students shall tick (✓) the correct answer.
> No marks shall be given for overwrite / erasing.
> Students have to submit the Objective Part (Part-A) to the invigilator just after completion of the allotted time from the starting of examination.

Table with 2 columns: Full Marks, Marks Obtained. Row 1: 20, (empty)

Scrutinizer's Signature

Examiner's Signature

Invigilator's Signature