

M.Sc. ENVIRONMENTAL SCIENCE
FIRST SEMESTER
ENVIRONMENTAL CHEMISTRY
MEV – 102

**SET
A**

[USE OMR FOR OBJECTIVE PART]

Duration: 3 hrs.

Full Marks: 70

Time: 30 min.

(Objective)

Marks: 20

Choose the correct answer from the following:

1×20=20

- Most productive soil in India is,
 - Regur soil
 - Alluvial soil
 - Acidic soil
 - Red soil
- Reagents used in estimation of DO
 - Manganese sulphate, alkali iodide-azide, starch solution
 - Calcium carbonate, KI, Starch
 - Magnesium sulphate, KI
 - None of above
- Which of the following is not a physical water quality parameter?
 - Suspended solids
 - Turbidity
 - Taste
 - Metals
- Cultivation is very difficult in which type of soil ?
 - Alluvial soil
 - Red soil
 - Black soil
 - Sandy soil
- Which of the following is a non-toxic metal found in natural water?
 - Silver
 - Sodium
 - Barium
 - Cadmium
- Which type of soil water available for plant?
 - Gravitational water
 - Hygroscopic water
 - Capillary water
 - None of the above
- The Troposphere contains ---% mass of the atmosphere
 - 50
 - 70
 - 90
 - 95
- Important technique that enables the separation, identification, and purification of the components of a mixture for qualitative and quantitative analysis
 - Chromatography
 - Titrimetry
 - Spectroscopy
 - Electrophoresis
- Other name of Regur soil is,
 - Black soil
 - Red soil
 - yellow soil
 - Sandy soil

10. A thermodynamic state function is a quantity
- | | |
|---|--|
| a. used to determine heat changes | b. whose value is independent of the path |
| c. used to determine pressure-volume work | d. whose value depends on temperature only |
11. Greenhouse gases causing a rise of 3°C rise in the overall global temperature in the past century are CFCs. The CFC used in refrigerators is
- | | |
|------------|-------------|
| a. Ammonia | b. Chlorine |
| c. Methane | d. Freon |
12. Cloudiness or haziness of a fluid caused by large numbers of individual particles that are generally invisible to the naked eye is called,
- | | |
|--------------------|-------------------------|
| a. BOD | b. Turbidity |
| c. Surface tension | d. solids, conductivity |
13. Enthalpy of an endothermic reaction is
- | | |
|-------------|--------------------------------|
| a. Positive | b. Negative |
| c. Zero | d. May be positive or negative |
14. River side soil is
- | | |
|----------------|------------------|
| a. Black soil | b. Red soil |
| c. Saline soil | d. Alluvial soil |
15. For the process to occur under adiabatic conditions, the correct condition is
- | | |
|-------------------|-------------------|
| a. $\Delta T = 0$ | b. $\Delta p = 0$ |
| c. $q = 0$ | d. $W = 0$ |
16. Hollow cathode lamp is a part of
- | | |
|-------------------|------------------|
| a. HPLC | b. AAS |
| c. Chromatography | d. None of above |
17. Reddish colour in red soil due to
- | | |
|-----------------------|---------------------|
| a. Overgrazing | b. Presence of iron |
| c. Presence of potash | d. Presence of zinc |
18. Bragg's law is related to
- | | |
|--|--------------------------|
| a. Atomic Absorption Spectrophotometer | b. X-ray crystallography |
| c. Flame photometer | d. All of above |
19. The conjugate base of H_2O is
- | | |
|-------------|------------------|
| a. H_3O^+ | b. OH^- |
| c. H_2O | d. None of above |
20. Following form(s) of oxygen is/are involved in ozone-oxygen cycle
- | | |
|----------------------|--------------------|
| a. Triatomic oxygen | b. Diatomic oxygen |
| c. Monoatomic oxygen | d. All of above |

(Descriptive)

Time : 2 hrs. 30 min.

Marks : 50

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

1. What is Green Chemistry? Write the principles of Green Chemistry. 2+8=10
2. What is soil organic matter? Write an account on the role of microorganisms in decomposition process in soil. 3+7=10
3. What are water quality parameters? Write about causes, impacts and measurements of any two water quality parameters. 2+4+4=10
4. Differentiate between (any four): 2.5x4=10
 - i) Order and Molecularity
 - ii) Soaps and Detergents
 - iii) Extensive properties and Intensive Properties
 - iv) First order reaction and Second order reaction
 - v) Classical smog & Photochemical smog
5. Discuss formation and decomposition of Ozone in the atmosphere. 10
6. Discuss principles of any two analytical methods in water chemistry. 5+5=10
7. Discuss causes, consequences and preventive measures of acid rain. 10
8. Write notes on (any two) 5+5=10
 - a. Micro and macro nutrients
 - b. Soil profile
 - c. Cleaning action of soaps and detergents

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