REV-01
BSC/19/24

2023/12

SET A

B.Sc. CHEMISTRY
FIFTH SEMESTER
INDUSTRIAL CHEMICALS & ENVIRONMENT
BSC - 507B

[USE OMR FOR OBJECTIVE PART]

Duration: 3 hrs. **Full Marks: 70**

Objective

Time: 30 min. **Marks: 20**

Choose the correct answer from the following: ***1×20=20***

1. Photochemical smog does not possess
   a. Ozone b. CO_2
   c. NO_2 d. PAN

2. Which oxide of nitrogen is not a common pollutant introduced into the atmosphere both due to natural and human activity-
   a. N_2O_5 b. NO_2
   c. N_2O d. NO

3. Which of the following atmosphere pollutants is not produced by the exhaust of motor vehicle in Meghalaya
   a. SO_2 b. Hydrocarbon gases
   c. Fly ash d. CO

4. Which one of the chemical is responsible for Bhopal disaster
   a. Methyl isocyanate b. CO
   c. Dioxin d. TDCC

5. Kyoto Protocol is negotiated by UNFCCC to reduce
   a. Air pollution b. Climate action
   c. Green house emission d. Particulate emission

6. The Potassium permanganate oxidizes Oxalate ion into
   a. Oxalic acid b. Carbon dioxide
   c. Carbon monoxide d. All of the above

7. Which of the following gas used in oxy-acetylene flames for cutting mild steel
   a. Hydrogen b. Acetylene
   c. CO_2 d. CO

8. Which of the following gas is used in various mechanical equipment
   a. F_2 b. N_2
   c. O_2 d. He

9. Which of the following gas is manufactured by the electrolysis of water
   a. N_2 b. H_2
   c. CO d. CO_2

10. When work is done on air, by compressing it
    a. It becomes hotter
    b. It becomes cooler
    c. Does not any change
    d. None of the above

11. Which of the following is not a part of the water cycle?
    a. Evapotranspiration
    b. Condensation
    c. Precipitation
    d. None of the above

12. The principal gaseous products of waste incineration is/are
    a. Carbon dioxide
    b. Water vapour
    c. Both a and b
    d. Carbon monoxide

13. Water can be deionized by
    a. Electrodialysis method
    b. Ion exchange method
    c. Both a and b
    d. None of the above

14. Which of the following chemical/s can be used as coagulants for water treatment?
    a. Aluminium sulphate
    b. Ferrous sulphate
    c. Ferric chloride
    d. All of the above

15. Which oxidant is used for COD treatment of water sample?
    a. $KMnO_4$
    b. $K_2Cr_2O_7$
    c. $FeCl_3$
    d. None of the above

16. Which of the following fuel is a Primary Energy Resource?
    a. Petrol
    b. Electric Energy from combustion of coal.
    c. Natural Gas
    d. None of the above.

17. Solar Energy originates from
    a. Solar heating system.
    b. Thermonuclear fission.
    c. Thermonuclear nuclear fusion.
    d. None of the above.

18. Reactivity Excursion is
    a. Presence of excess coolents.
    b. Controlled fission
    c. Uncontrolled fission
    d. None of the above

19. Manmade source of Pollutant is
    a. Cosmic radiation
    b. Nuclear reactor for power generation
    c. Radioactive minerals
    d. None of the above.

20. **Synrock is a**
    a. Titanic ceramic material.
    b. Natural mineral
    c. Occurs in moon
    d. None of the above

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Descriptive

Time : 2 hrs. 30 min. **Marks : 50**

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

1. **a.** What are primary pollutants? Discuss their sources and relative contribution to air pollution? **3+3+2+2 =10**
   b. Write the principles involved in the fractional distillation of air.
   c. What are the functions of aquatic ecosystem?
   d. What is a photovoltaic cell? Discuss the mechanism of storage of Solar Energy in this cell.

2. **a.** What is ozone layer depletion? Write the name of two ozone depleting substance (ODS). **1.5+6+ 2.5 =10**
   b. Define the following terms: (i) Flyash (ii) Green house effect (iii) Carbon foot Print.
   c. Explain the reactions of $Pb(C_2H_5)_4$ on combustion of gasoline?

3. **a.** Define the term Photochemical smog? How do you control of photochemical smog? **4+6=10**
   b. What is wind power? How is it harnessed? What are it's limitations?

4. **a.** Give an account of Inorganic particulate matter? **3+2+5 =10**
   b. Explain the electrolysis process of water with chemical reactions.
   c. Write the uses of the following industrial gases
   (i) Nitrogen (ii) Oxygen (iii) Hydrogen

5. **a.** Write the manufacturing process and chemical reactions of sulphuric acid. **4+3+3 =10**
   b. How permanganate ion oxidises Fe^{2+} and NO_2^- in acidic medium? Explain with chemical reactions.
   c. Write the synthesis process and uses of potash alum.

6. a. What are the different types of aquatic ecosystem? Write in detail. 5+5=10
   b. Explain what are the methods for monitoring and measuring water pollution?

7. a. Write short notes on i) DO ii) BOD iii) COD 2×3+2+2
   b. Write about all the methods used to disinfect water? =10
   c. What is Geothermal Energy?How is it utilised?

8. a. What are the causes of nuclear reactor accidents? 4+4+3
   b. Explain with brief reference to "Chernobyl' and 'Three Mile Island' Disasters. =10
   c. How such disasters are prevented?

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