P P SAVANI UNIVERSITY

Fifth Semester of B.Sc. Examination

Dec.-Jan.-2020-2021

SSES3150–Environmental Chemistry

07.01.2021, Thursday Time: 10:00am. to 12:30p.m. Maximum Marks: 60

Section-A (Total Marks - 20)

Q.1 **Objectives (20 MCQ Compulsory-1 mark each)** (20)

1 The theory of ionization stems from a doctoral dissertation completed by

- A Svanstrom in 1993
- B Arrhenius in 1887
- C Amedeo Avagadro in 1889
- D Jacob Berzilius 1848

2 Fundamental concept of solubility product is

- A All solids, no matter how insoluble, are soluble to some degree.
- B All solids, no matter how insoluble, are insoluble to some degree.
- C All liquids, no matter how insoluble, are soluble to some degree.
- D All liquids, no matter how insoluble, are insoluble to some degree.

3 The adverse effect that unrelated ions often have upon solubility of some relatively insoluble substances is

- A Binary mixture
- B Tyndall effect
- C Common ion effect
- D Diverse ion effect

4 At certain mole ratios have vapor pressures less than either of the components and, consequently, at these ratios have boiling points that are greater than either of the components. This property is exhibited by which class binary mixtures?

- A Class I binary mixtures
- B Class II binary mixtures
- C Class III binary mixtures
- D Class IV binary mixtures

5 Finely divided $CaSO_4$ dissolves to the extent of

- A 2.15 g/L at 25°C
- B 2.08 g/L at 25°C
- C 2.54 g/L at 25°C
- D 2.67 g/L at 25°C

6 The movement of a solvent through a membrane that is impermeable to a solute is:

- A Ionization product
- B Solvent extraction
- C Dialysis
- D Osmosis

7 The equilibrium constant, K is known as

- A Distribution coefficient
- B Substitution coefficient
- C Molar ratio
- D None of the above

8 Butane occurs in how many isomeric forms

- A 1
- B 2
- C 4
- D 6

9 Ozonides react readily with water to form:

- A Aldehydes

B Ketones
C Alcohols
D Ozone

10 Pyrrole and pyrrolidine are examples of compounds having
A 2 membered ring containing N
B 3 membered ring containing N
C 4 membered ring containing N
D 5 membered ring containing N

11 In COD, which of the following is used as an indicator?
A Ferroin
B Starch
C Phenolphthalein
D Methyl orange

12 The colloidal particles are in the size range of
A 1 to 1000 nm
B 10 to 100 nm
C 0.001 to 1 nm
D 1 to 10 nm

13 Which basic ingredient of detergents has property of being "surface active" in solution?
A Organic materials
B Sulphur compounds
C Inorganic compounds
D All of the above

14 Which method is used to determine the concentration Dissolved oxygen in water sample?
A Mohr method
B Open reflux method
C Complexometric method
D Azide modification of Winkler's method

15 Malathion belongs to which category of pesticides?
A Organic phosphorus pesticide
B Natural pesticide
C Carbamate pesticide
D Organic chloride pesticide

16 What are the esters of long-chain monohydroxy alcohols called?
A Fats
B Waxes
C Oils
D Detergents

17 Which of the following water parameters is estimated by turbidimetric method?
A Nitrogen
B Oil and Grease
C Sulphate
D None of the above

18 Which phenomenon is used to determine the nature of the charge on colloidal particle?
A Electrophoresis
B Brownian motion
C Solubility
D Tyndall effect

19 Which of the following is a major interference in Dissolved oxygen estimation?
A Nitrite
B Nitrate
C Sulphate
D Phosphate

20 Which of the following pesticides are effective for the control of grasses?

A IPC
B DDT
C Parathion
D Malathion

Section-B (Total Marks - 40)

Q.1 Short Notes (attempt all four compulsory- 3 marks each) (12)

A Explain the principles of solvent extraction.

B What are heterocyclic compounds? Give example along with chemical structure.

C Explain the environmental significance of the estimation of dissolved oxygen.

D What are fats, oils and waxes?

Q.2 Explain in detail (attempt any four-7 marks each) (28)

A Define binary mixtures. Explain class I binary mixtures with the help of diagram

B What are hydroxyacids? Give 2 examples. How lactic acid is optically active? Explain.

C What are complex sugars or disaccharides? Explain the chemical structure and properties of sucrose, maltose and lactose.

D What are colloidal dispersions? Explain various properties of colloidal dispersions.

E Explain nitrogen cycle.