2024

(CBCS)

(1st Semester)

HOME SCIENCE

(Chemistry)

Full Marks : 75

Time : 3 hours

The figures in the margin indicate full marks for the questions

(SECTION : A—OBJECTIVE)

(*Marks* : 10)

Tick (✓) the correct answer in the brackets provided : 1×10=10

1. Normal pH refers to

(a) 0 ( )

(b) 5 ( )

(c) 6 ( )

(d) 7 ( )

2. The particle that can exist in free state is

(a) molecule ( ) *(b)* atom ( )

(c) proton ( ) *(d)* neutron ( )

3. The general formula for alkane is

(a) C_nH_{2n} ( ) *(b)* $C_nH_{2n\ 2}$ ( )

(c) $C_nH_{2n\ 2}$ ( ) *(d)* $C_{2n}H_n$ ( )

4. 'Marsh gas' is

(a) methane ( ) *(b)* propane ( )

(c) ethane ( ) *(d)* butane ( )

5. The general formula of alkyl halides is

(a) R—X ( ) *(b)* R—H ( )

(c) H—X ( ) *(d)* X—X ( )

6. Alcohols are class of compound containing

(a) COOH ( ) *(b)* HOH ( )

(c) KOH ( ) *(d)* OH ( )

7. Aldehyde contains the functional group

(a) —CHO ( ) *(b)* $—CH_2OH$ ( )

(c) —CHOH ( ) *(d)* $—CH_2O$ ( )

8. Acetone is also known as

(a) alkanol ( ) *(b)* diethyl ketone ( )

(c) dimethyl ketone ( ) *(d)* trimethyl ketone ( )

9. The acid which is most abundantly present in lemon juice is

(a) acetic acid ( )

(b) formic acid ( )

(c) tartaric acid ( )

(d) citric acid ( )

10. Vinegar contains

(a) citric acid ( )

(b) formic acid ( )

(c) acetic acid ( )

(d) oxalic acid ( )

(SECTION : B—SHORT ANSWERS)

(*Marks* : 15)

Answer/Write on the following : 3×5=15

UNIT—I

1. Define atom.

OR

2. Define pH.

UNIT—II

3. Uses of methane

OR

4. Structural formula of ethane

UNIT—III

5. Structural formula of methyl iodide

OR

6. Physical properties of glycerol

UNIT—IV

7. Uses of formaldehyde

OR

8. Physical properties of acetone

UNIT—V

9. Structural formula of citric acid

OR

10. Uses of oxalic acid

(SECTION : C—DESCRIPTIVE)

(*Marks* : 50)

Answer the following questions : 10×5=50

UNIT—I

1. *(a)* Define the following : 1×4=4

(i) Molecule

(ii) Valency

(iii) Buffer solution

(iv) Chemical equation

(b) An organic substance on analysis found to contain 10·06% carbon, 0·84% hydrogen and 89·10% chlorine. Calculate its empirical formula (atomic weight of carbon = 12, hydrogen = 1, chlorine = 35·5). 4

(c) What do you mean by diffusion? 2

OR

2. *(a)* Distinguish between normality and molarity giving examples. 2+2=4

(b) Describe oxidizing agents and reducing agents giving examples. 2+2=4

(c) Calculate the amount of sulphuric acid (H_2SO_4) required to prepare 0·1*N* solution of sulphuric acid solution in 200 ml. 2

UNIT—II

3. *(a)* Describe saturated and unsaturated hydrocarbons giving examples in each. 2+2=4

(b) How will you detect nitrogen in organic compound? 2

(c) Describe laboratory method for the preparation of methane with diagram. 4

OR

4. *(a)* How will you detect sulphur in organic compound? 3

(b) Write three important uses of ethane. 3

(c) What happens when—

(i) methane burns in air or O_2;

(ii) ethane reacts with nitric acid vapour? 2+2=4

UNIT—III

5. *(a)* What are alkyl halides? Describe the laboratory method for the preparation of methyl iodide with diagram and equation. 1+4=5

(b) What is ethyl iodide? Describe the structural formula of ethyl iodide. 1+2=3

(c) Write two important physical properties of methyl iodide. 2

OR

6. *(a)* Describe, with equation, how ethyl alcohol is manufactured by fermentation of sugars. 4

(b) Write three important uses of glycerol. 3

(c) Write three important physical properties of methyl alcohol. 3

UNIT—IV

7. *(a)* What do you mean by carbonyl group? Differentiate between aldehydes and ketones with examples. 1+3=4

(b) What is formaldehyde? Describe the structural formula of formaldehyde. 1+2=3

(c) Write three important physical properties of formaldehyde. 3

OR

8. *(a)* What is acetone? How is acetone can be prepared by general method? 1+3=4

(b) Write three important uses of acetone. 3

(c) What is acetone? Describe the structural formula of acetone. 3

UNIT—V

9. *(a)* What is carboxylic acid? Describe one method for the preparation of oxalic acid. 1+3=4

(b) Write three important uses of formic acid. 3

(c) What is acetic acid? Describe the structural formula of acetic acid. 1+2=3

OR

10. *(a)* What is tartaric acid? Describe the preparation of tartaric acid from grape juice. 1+3=4

(b) Mention three important uses of citric acid. 3

(c) Write three important physical properties of tartaric acid. 3

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