K20U 0458

Reg. No. : .....

Name : .....

II Semester B.Sc. Degree CBCSS (OBE) – Regular Examination, April 2020
(2019 Admission)
COMPLEMENTARY ELECTIVE COURSE IN CHEMISTRY/POLYMER CHEMISTRY
2C02CHE/PCH : Chemistry (For Physical and Biological Sciences)

Time : 3 Hours Total Marks : 32

Instruction *: Answer the questions in* ***English only****.*

SECTION – A

Answer **all** questions. **Each** question carries **1** mark :

1. If half of HI in a vessel decomposes, at a certain temperature, K_c = _____.
2. The emission of radiation due to the transition from singlet excited state to ground state is called _____.
3. A colloidal system in which both dispersed phase and the dispersion medium are liquids is known as _____.
4. The erratic zig-zag movement of colloidal particles is known as _____.
5. An indicator that can be used for a weak acid-strong base titration is _____. **(5×1=5)**

SECTION – B

Answer **any four** questions. **Each** question carries **2** marks :

6. Give the IUPAC names of :
   i) $ClCH_2 - CH_2 - CH(CH_3) - COOH$
   ii) $CH_3 - CH(OH) - CH = CH_2$.
7. What is meant by carbocations ?
8. Give any four reasons for low quantum yield.

P.T.O.

9. Lyophilic sols show weak Tyndall effect. Why ?

10. Calculate the mass of sodium carbonate, to be dissolved, to prepare 500 ml of 0.1 M solution.

11. Write a note on common ion effect. **(4×2=8)**

SECTION – C

Answer **any three** questions. **Each** question carries **3** marks :

12. Illustrate Huckel's rule using cyclopropenyl cation and cyclopentadienyl anion as examples.

13. Calculate K_p for a reaction $A_{(g)} + B_{(g)} \rightleftharpoons C_{(g)} + D_{(g)}$; $\Delta G^\circ = -3435$ kJ mol^{-1}.

14. State and explain Beer-Lambert's law.

15. Distinguish between lyophilic colloids and lyophobic colloids.

16. Write a note on permanganometry. **(3×3=9)**

SECTION – D

Answer **any two** questions. **Each** question carries **5** marks :

17. With the help of hybridization concept, predict the shapes of methane and ethylene.

18. State Le Chatelier principle. On the basis of this principle, discuss the effect of pressure and temperature on the equilibrium in the Haber Process.

19. Write a note on electrical double layer and zeta potential.

20. Briefly outline the application of the principles of solubility product and common ion effect in the separation of cations in qualitative analysis. **(2×5=10)**

K21U 3458

Reg. No. : .....

Name : .....

II Semester B.Sc. Degree (CBCSS-OBE-Reg./Sup./Imp.) Examination, April 2021
(2019 Admission Onwards)
COMPLEMENTARY ELECTIVE COURSE IN CHEMISTRY/POLYMER CHEMISTRY
2C02CHE/PCH : Chemistry (For Physical and Biological Sciences)

Time : 3 Hours Total Marks : 32

Instruction : *Answer the questions in* ***English*** *only.*

SECTION – A

Answer **all** questions. **Each** question carries **1** mark.

1. Give the relation between K_x and K_p.
2. The energy of one mole of photons is known as _____
3. If the dispersed phase is liquid and the dispersion medium is solid, the colloidal system is called _____
4. The substance which stabilizes an emulsion is called _____
5. In inorganic qualitative analysis, group III cations are precipitated as their _____ **(5×1=5)**

SECTION – B

Answer **any four** questions. **Each** question carries **2** marks.

6. Write the structural formula of ethyl methyl ketone and give its IUPAC name.
7. State and explain Huckel's rule of aromaticity.
8. What is meant by photosensitization ?

P.T.O.

9. Define flocculation value of a sol.

10. Calculate the molality of a solution obtained by dissolving 18 g of glucose in 4 kg of water.

11. What is meant by iodometric titrations ? **(4×2=8)**

SECTION – C

Answer **any three** questions. **Each** question carries **3** marks.

12. Arrange the following ions in the increasing order of their stability and explain the reason.
    i) $(CH_3)_3C^+$
    ii) $CH_3CH_2^+$
    iii) $(CH_3)_2CH^+$
    iv) CH_3^+

13. State and explain law of mass action.

14. Distinguish between fluorescence and phosphorescence.

15. What are the reasons for the stability of lyophilic sols ?

16. Describe the principle of colorimetry. **(3×3=9)**

SECTION – D

Answer **any two** questions. **Each** question carries **5** marks.

17. Discuss the structure and stability of benzene on the basis of Molecular Orbital theory.

18. On the basis of Le Chatelier principle, discuss the effect of pressure, temperature and concentration on the equilibrium : $N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$; $\Delta H = -93.74$ kJ.

19. Write a note on different classes of colloidal systems.

20. Briefly outline the application of the principles of solubility product and common ion effect in the separation of cations in qualitative analysis. **(2×5=10)**
