

U.G. 1st Semester Examination - 2021

CHEMISTRY

[HONOURS]

Course Code : CHEM-H-CC-P-1

[PRACTICAL]

Full Marks : 20

Time : 2 Hours

The figures in the right-hand margin indicate marks.

Group-A

(Inorganic Chemistry)

1. Answer any **one** from the following: 10×1=10
- a) Draw the titration curves (pH vs volume of acid added) for i) strong acid-strong base and ii) weak acid-weak base titrations. Show the equivalence point for each case. Draw the structure of methyl red in acidic and basic medium. Calculate equivalent weight of NaHCO₃. 4+2+2+2
- b) Why Na₂CO₃ is used as primary standard for standardization of HCl? Write the principle for the estimation of Na₂CO₃ and NaOH in a mixture. What is acid-base indicator? How do you prepare 900 ml 2(N) H₂SO₄ starting from

[Turn over]

conc. H₂SO₄? During titration of 10 ml 1(N) Na₂CO₃ solution using 1(N) HCl solution, methyl orange shows end point after addition of 10 ml HCl, but phenolphthalein shows end point after addition of 5 ml HCl-why?

2+3+1+2+2

Group-B

(Physical Chemistry)

2. Answer any **one** question: 10×1=10
- a) What do you mean by buffer capacity? If NaOH solution is gradually added to a solution of acetic acid, what will be the buffer capacity just at the end of the neutralization point and why? Describe the working principle to determine the pH for a given unknown buffer solution using methyl red/bromocresol green indicator. 2+3+5
- b) What do you understand by enthalpy of solution and enthalpy of hydration? Describe the working principles and methodologies to study the determination of heat of solution of oxalic acid from solubility measurement. How do you calculate calorimeter constant? 2+3+3+2