U.G. 1st Semester Examination - 2020

CHEMISTRY

[HONOURS]

Course Code : CHEM-H-CC-P-01

[PRACTICAL]

Full Marks : 20 Time : 2 Hours

The figures in the right-hand margin indicate marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP–A

(Inorganic Chemistry)

1. Answer any **one** from the following: 10×1=10

a) What do you mean by primary and secondary standard solution? Give examples. $NaHCO_3$ is primary standard or secondary standard? Justify your answer. Why phenolphthalein is used for the estimation of Na_2CO_3 and NaOH in a mixture? What is indicator constant (K_{in})? Write the structures of Phenolphthalein and methyl orange in both acidic and alkaline medium. (1+1)+2+3+1+(1+1)=10

b) Before any quantitative estimation,why calibration of burette, pipette and volumetric flask is necessary? Calculate the equivalent weight of Na_2CO_3. What is pH range for the colour transition of an indicator? For titration of weak acid and strong base, which indicator you will use and why? Write the principle for the estimation of Na_2CO_3 and $NaHCO_3$ in a mixture. 3+1+1+2+3=10

GROUP–B

(Physical Chemistry)

Answer any **two** questions: 5×2=10

1. a) What are buffer solutions?

   b) Write Henderson equation.

   c) Define buffer capacity and when is buffer capacity of a buffer is maximum? 2+1+2

2. a) Define heat of neutralization.

   b) "Heat of neutralization of strong acid vs. strong base in dilute solution is constant"– explain.

   c) "For weak acid vs. a weak base, the heat of neutralization is not same but less than strong acid vs. strong base"– explain. 2+1+2

3. Write the theory for the determination of the heat of solution of oxalic acid at its saturation from the solubility measurements at different temperatures. 5

4. Write the theory for the determination of pH of unknown solution by color matching method. 5

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