CARMEL COLLEGE OF ARTS, SCIENCE & COMMERCE FOR WOMEN

SEMESTER END EXAMINATION JANUARY 2021

SEMESTER III OF B.SC

PHYSICAL AND ORGANIC CHEMISTRY (CHC103)

Time: 2 hr [10.00-12.00 pm]   **Date: 4/1/2021**   **Marks: 40**

*Instructions:.1) Figures to the right indicate **full** marks.*

2)Signature and roll number should be on all the pages.

3) Upload the answer papers in PDF format before 1.00pm.

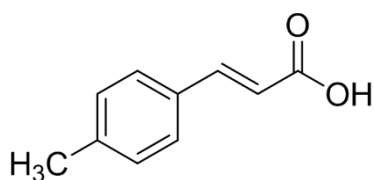**Q. I Answer *any 5* questions from the following**   **(2 mks each)**

1. Why is Solid CO_2 known as Dry Ice?

2. What do you understand by CST?

3. Calculate the reduction potential of the following electrode

   $Pt \mid Sn^{+2}(a=0.01), Sn^{+4}(a=0.02)$

   Given std reduction potential of the above electrode is 0.15V

4. Identify the type of electrodes used and write the cell reaction for the following cell:

   $Ag \mid AgCl_{(s)}, Cl^- \parallel Fe^{+3}, Fe^{+2} \mid Pt$

5. Why does Acetylchloride get hydrolysed more reactive than Ethyl acetate?

6. What are amino protecting groups? Give two examples

7. A 0.02M solution of a compound transmits 30% of the radiation in a container with path length equal to 1.5 cm. calculate the molar extinction coefficient of the compound.

8. Outline the synthesis of butanamine using Gabriel Phthalimide synthesis.

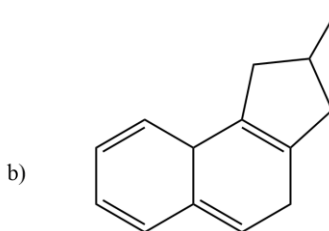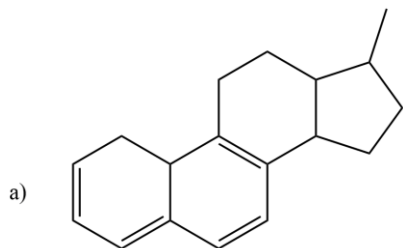**QII. Answer *any 6* questions from the following**   **(5 mks each)**

1. (a) Give Suitable example of the following: (2)

    (i)   Triple Point
    (ii)   Invariant system
    (iii)   Cryohydric Point
    (iv)   Eutectic point

(b) Sketch and explain Congruent Melting Point & Eutectic points for the suitable

system. (3)

2. (a) Distinguish between Ideal and Non Ideal solution (2)

(b) The Vapour pressure of water at 293 K is 17.51 mm, lowering of (3)

vapour pressure of sugar solution is 0.0614 mm. Calculate

(i) Relative lowering of vapour Pressure

(ii) Vapour pressure of the Solution

(iii) Mole Fraction of water

3. a) Given $E^o_{Cu+2/Cu} = 0.337V$, (2)

$E^o_{Ag+1/Ag} = 0.799V$,

$E^o_{Fe+2/Fe} = -0.44V$

Answer the following using the above data from the EMF series.

i) Can we store 1M $AgNO_3$ solution in Cu vessel? Why?

ii) Why the blue colour of $CuSO_4$ solution gets discharged when iron rod is dipped in it.

b) Calculate the emf of the following cell at 298 K

Zn| $ZnSO_4$ (m= 0.01, γ = 0.30) || $ZnSO_4$ (m= 0.1, γ = 0.1) | Zn (3)

4. a) How will you find out the end point of an acid base titration

using conductometry ? Explain using suitable example. (2)

b) Explain with a neat diagram the moving boundary method to

determine transport number of an ion (3)

5. How would you prepare the following compound? Provide a reasonable arrow (5)
pushing mechanism to account for the transformation.

6. Using suitable amino acids explain the preparation of Gly-Ala. (5)

7. Apply Woodward-Fieser rules and calculate absorption maxima of the following compounds. (5)

a)

b)

8. Complete the following reactions: (5)

a)

b)

c)

d)

e)