

Total Page - 3

UG/2nd Sem/Chem/H/19

2019

B.Sc.

2nd Semester Examination
CHEMISTRY (Honours)

Paper - GE2P

Full Marks : 20

Time : 2 Hours

*The figures in the margin indicate full marks.
Candidates are required to give their answers
in their own words as far as practicable.
Illustrate the answers wherever necessary.*

Section - A

1. Carry out the experiment to be allotted to you from the set of experiments given below.

(Allotment of experiment to a candidate will be made by drawing lots at the commencement of examination on the date of examination) 8

- (a) Finding the surface tension of the supplied unknown solution by using a stalagmometer.

[Turn Over]

(2)

- (b) Finding the absolute viscosity of the supplied unknown solution by using an Ostwald's viscometer.
- (c) With the help of integrated rate method finding the rate constant of the reaction of hydrolysis of methyl acetate in presence of 1.0N HCl solution.

Total marks of 8 are divided among the items given below :

Theory :

For experiments (a) and (b), Marks : $2\frac{1}{2}$

For experiment (c), Marks : 2

[Theory for the allotted experiment must be written in brief; however, it must contain the working formula of the experiment (no derivation for the working formula is required)

Reporting data in tabular form, doing calculation and plotting graph (if any)

For experiment (a) and (b) :

Reporting data (in tabular form) + calculation,
Marks : 2+2

For experiment (c) :

(3)

Reporting data (in tabular form) + Calculation +
plotting graph, Marks : $1\frac{1}{2}+1\frac{1}{2}+1\frac{1}{2}$

Results : For each of the experiments (a), (b)
and (c) Marks : $1\frac{1}{2}$

Section - B

2. Detect qualitatively the radicals present in the supplied
sample marked by 'I'. 7
 3. Viva Voce. 3
 4. Laboratory Note book. 2
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Instruction to the examination

Section - A

1. Examiner are requested to

- (a) Make an allotment of the experiments per batch in the proportion gives below —

Measurement of surface tension (experiment - a) :
40%

Measurement of varicosity (experiment - b) :
40%

Kinetic study of acid hydrolysis of methyl acetate : 20%

- (b) Prepare two stock solutions of acetic acid with different concentrations (say 12% and 10%) for the experiment-a. Label them as SA and SB.

[Turn Over]

Supply a volume of 60ml of either SA or SB to a candidate who has been allotted the experiment-a. Solutions of SA or SB that are to be given to candidates must be marked with different labels such as SA₁, SA₂,...for the solution SA and SB₁, SB₂,...for the solution SB.

(c) Prepare two stock solutions of acetic acid with different concentrations (say 12% and 10%) for the experiment-b. Label them as VA and VB. Supply a volume of 60 ml of either VA or VB to a candidate having been allotted the experiment-b. Solutions of VA and VB that are to be given to candidate must be marked with different labels such as VA₁, VA₂,... for the solution VA and VB₁, VB₂,...for the solution VB.

(d) Supply 50 ml of 1N HCl solution to a candidate who has been allotted the experiment-c. Also supply necessary volume of $\frac{N}{10}$ NaOH solution that the candidate will require for titration.

2. Awarding Marks :

(a) Marks on the result of experiments (a) and (b) will have to be awarded on the basis of the result that examiners will get from their experiments.

(3)

If the result of the examiners and that reported by a candidate differ by

5%, then award marks $1\frac{1}{2}$

$>5\%$ – $<8\%$, then award marks 1

$>8\%$ – $<10\%$, then award mark $\frac{1}{2}$

> 10 then award mark 0

- (b) Marks on the result of experiment (c) will have to be awarded on the basis of the value available in literature at the temperature of experiment. If the value of rate constant available in literature has an order of 10^{-x} and that reported by a candidate has an order of 10^{-y} , then award.

Marks $1\frac{1}{2}$ if $x = y$

Marks 1 if $y = x + 1$

Marks 0 if $y > x + 1$

Section - B

1. (a) Following are the acid and basic radicals on the basis of which examiners are requested to prepare inorganic samples containing three radicals each.

[Turn Over]

(4)

Acid radicals : Cl^- , Br^- , I^- , NO_2^- , NO_3^- , S^{2-} ,
 SO_4^{2-} , PO_4^{3-} , BO_3^{3-} , H_3BO_3

Basic radicals :

Na^+ , K^+ , Ca^{2+} , Sr^{2+} , Ba^{2+} , Cr^{3+} , Mn^{2+}
 Fe^{3+} , Ni^{2+} , Cu^{2+} , NH_4^+

(b) Examiners are requested to mark each sample with the letter 'I' (e.g., I_1 , I_2 and so on)

2. Awarding Marks :

(a) For correct reporting of each radical : 2 Marks.

(b) For correct reporting of composition : 1 Marks of the sample.
