NEW

Part-II 3-Tier

2015

CHEMISTRY

(General)

PAPER—III

(PRACTICAL)

Full Marks : 100

Time : 6 Hours

The figures in the right-hand margin indicate full marks.

Group—A

1. Carry out any *one* of the following two experiments — (*Experiment should be selected by lottery*) :

(a) Detect any *three* radicals (acid/base/interfering acid) in the supplied inorganic sample marked "I". (Ignore CO_3^{2-} radical present in the sample.)

(i) Physical properties. 3

(ii) Dry tests for acid and basic radicals (*only positive tests*). 6

(iii) Dry test for interfering acid radicals. 6

(iv) Wet tests for acid and basic radicals (*only positive tests*). 12

(v) Confirmative tests for three radicals. 3

(vi) Correct naming of three radicals in ionic form. 3

Or

(b) Prepare 250 ml. approx. $\left(\frac{N}{10}\right)$ standard solution of oxalic acid by accurate weighing in an analytical balance. Mention the type of balance used for weighing.

Standarised the unknown $\left(\frac{N}{10}\right)$ $KMnO_4$ solution using the standard oxalic acid solution.

Find out the amount of Fe^{++} ions in gm / litre in the supplied unknown Mohr salt solution in the bottle marked "V" using the $KMnO_4$ solution :

(i) Weighing in chemical balance. 8

(ii) Volumetric results upto four decimal places. 25

Group—B

2. Make a systematic qualitative analysis of the organic compound supplied in the container marked "O".

(i) Give the name and procedure of the experiment and detect the presence or absence of the special elements namely — nitrogen (N), sulphur (S) and halogens (Cl, Br, I) in the supplied compound. 10

(ii) Detect the presence or absence of the following functional groups :

— COOH, — OH (Phenolic), >C = O (Ketonic), — CHO (Aldehyde), — NH_2 (Aromatic) and — NO_2 (Aromatic). 18

(iii) Give the confirmative test of any one of the functional groups present in the supplied compound. 3

(iv) Naming of the functional group(s) detected. 2

Group—C

4.	Laboratory Note Book.	12
5.	Internal performance / Attitude / Attendance.	10
6.	Viva-Voce.	12

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[Instructions to the Examiners]

1. All the Principals/Teacher-in-charges/Head of the Department of different Colleges are requested that before commencement of the Practical examination a copy of the examination schedule with the names of internal and external examiners should be sent to the Head Examiner for his record.
2. Examiners are requested to give instructions to examinees about questions and marks distributions.
3. Each practical examination batch should consist of 18–20 examinee.
4. Key of the samples (Inorganic and Organic) with full signatures of both examiners should be kept in a sealed cover and are to be opened jointly by the examiners after the examination of the centre is completed.

5. Examiners are requested to prepare at least four different Mohr salt solution roughly $\left(\frac{N}{10}\right)$ strength. At least 150 ml — 200 ml of the unknown Mohr salt solution to be supplied by container marked "V" to each examinee for Question No. 1 (b). A bulk solution of appriximate $\left(\frac{N}{10}\right)$ $KMnO_4$ solution have to be supplied for oxalic acid and Mohr salt solution titration.

6. Examiners are directed to set up atleast 25% Quanlitative / Quantitative Experiments (Question No. 1) in a batch of examinees.

7. During the practical examination, Head Examiner may visit the Examination Centre without giving any prior intimation.

8. Two unknown solutions may be repeated in two consecutive batches. Fresh unknown solutions with altered strength should be supplied in the next two batches and so on.

9. Data for three titrations should be properly tabulated by the candidate and should be signed by the examiner. Titre values differing by more than 0.2 m*l* should not be accepted.

10. Examiners should titrate the unknown solutions after the examinations of a batch is over using similar sets of apparatus and same chemicals as supplied to the candidates.

11. Care should be taken to check the Examiners's signature in the examined-scripts and award-lists.

12. T.A. bill for the External Examiners and remuneration vouchers for both the examiners may be sent to H.E. in separate envelopes as early as possible after completion of the practical examination.

13. Examiners are requested to send the examined scripts along with keys, award-lists, distribution-record and top-sheets showing the candidates presence and absence, to the H.E. positively within 7 days after the examination of the centre is over, personally / through a messenger of his Ramnagar College, P.O.-Depal, Dist.-Purba Medinipur, Pin-721453, Mob. No.-9733531538.

14. Co-operation of all the examiners is earnestly solicited for the smooth conducting of the said Practical examination in scheduled time.

Evaluation of answer scripts :

1. (a) (i) Physical properties — State, colour and solubility. 3

(ii) Specify the name of the test & only positive test. 6

(iii) For absence or presence. 6

(iv) Description of making of solution for acid and basic radicals. 2+2

(v) In wet method only positive tests are to be performed for acid and basic radicals. 8

(vi) Confirmative test can be shown during the course of analysis or separately. 3

(vii) Correct naming of three radicals in ionic form. 3

Or

(b) (i) Weighing upto decimal mark (1·575 ± 0·1000) and name of the balance used. 6+2

(*Weight recorded should be checked and signed by the examiner during the experiment*).

(ii) Estimation of Fe^{++} ion in unknown Mohr salt solution of container marked "V" :

Results : Calculation upto four decimal places :

Error upto	3%	25
"	> 3% and upto 4%	20
"	> 4% and upto 5%	15
"	> 5% and upto 6%	10
"	> 6%	00

[**N.B.** : *Minimum one titre value should be signed by the examiners, if not signed the titre value, award zero mark for 1. b.(ii) section.*]

2. (i) Name of the experiment and procedure. 1+2

Detection of elements (N, S, Cl, Br, I) :

— Presence or absence. 2+2+3

(ii) Marks to be awarded separately for each functional groups.

Award no credit for wrong detection of functional groups.

(iii) Confirmative test can be shown during the course of detection or separately.

(iv) Naming with formula of the functional group / groups detected.

[Direction for Inorganic and Organic Sample Preparation]

A. List of Samples for detection of Inorganic Qualitative Analysis :

1. Sodium sulphate + Sodium sulphide
2. Sodium nitrate + Sodium chloride
3. Sodium sulphide + Sodium nitrate
4. Sodium sulphide + Sodium chloride
5. Sodium bromide + Sodium chloride
6. Potassium nitrate + Potassium chloride
7. Ammonium sulphate + Boric acid
8. Boric acid + Sodium chloride
9. Potassium iodide + Potassium nitrate
10. Zinc phosphate + Zinc sulphate
11. Ferric chloride + Boric acid
12. Nickel sulphate + Nickel phosphate
13. Copper nitrate + Copper borate
14. Boric acid + Ammonium chloride
15. Boric acid + Calcium chloride
16. Copper sulphate + Copper nitrate
17. Copper borate + Copper chloride
18. Zinc phosphate + Zinc sulphide
19. Nickel sulphate + Boric acid
20. Ferric phosphate + Ferric chloride
21. Sodium chloride + Sodium nitrite

B. List of samples for detection of Organic Qualitative Analysis (*Question No. 2*) :

1. Benzoic acid
2. Citric acid
3. Salicyclic acid
4. Oxalic acid
5. Anthranilic acid
6. Succinic acid
7. Sulphanilic acid
8. Cinnamic acid
9. p-Hydroxy benzoic acid
10. p-Amino benzoic acid
11. Aniline hydrochloride
12. Resorcinol
13. Vaniline
14. Benzophenone
15. β-Naphthol
16. m-Nitroaniline
17. m-Dinitrobenzene
18. p-Toluidine
19. o-Nitrophenol
20. α-Naphthyl amine
21. p-Nitrophenol
