NEW

Part-III 3-Tier

2017

CHEMISTRY

PAPER—IVA

(General)

Full Marks : 45

Time : 2 Hours

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

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

Illustrate the answers wherever necessary.

Group—A

Answer any *one* of the following : 1×15

1. (a) What is LPG ? How is it prepared from petrol ? How any leakage of LPG cylinder can be detected ?

   (b) What is Cetane number ?

(c) Define nitrification and denitrification of glass.

(d) Write notes on :

(i) Vulcanization of rubber ;

(ii) Catalytic Cracking.

$(1+2+1)+2+(2+2)+(2\frac{1}{2}\times2)$

2. (a) What is Portland Cement ? How this cement is manufactured ?

(b) What is meant by NPK fertiliser ? How Ammonium sulphate is manufactured from Gypsum ? Write down the chemical reactions in this process.

(c) What is R_f factor ? How TLC is used for identification of a compound ?

$(1+4)+(1+2+2)+(2+3)$

3. (a) How is urea prepared by industrial process ? Give a flow diagram of the process.

(b) What is understood by hydrogenation of an oil ? What type of chemical change takes place during hydrogenation ? What type of impurities affect catalytic activity in hydrogenation.

(c) What is understood by the term 'refining of glass'.

(d) What is difference between optical glass and ordinary glass. Name specific colouring oxide to produce blue colour in glass ?

5+(2+1+2)+2+(2+1)

Group—B

Answer any *two* of the following : 2×10

4. (a) What is standard deviation ? What are its advantages ?

(b) Write the reaction for synthesis of Aspirin. Mention its important uses. Does it possess any toxicity ?

(c) Why aldrin has a limited use ?

(2+2)+(2+1+1)+2

5. (a) What is artificial rubber ? Why compounding of artificial rubber is done ?

(b) What are the natural food flavouring substances ? Give two examples.

(c) Why colouring of food is needed — Explain. What is antioxidant ?

(1+2)+(2+2)+(2+1)

6. (a) What is detergent ? What are cationic, anionic and neutral detergent ? Give examples of each class.

(b) What is carbon black ? Give the reactions for its preparation.

(c) What is emulsifier ?

(1+3)+(2+2)+2

7. (a) Name the different types of RNA molecules. What are their functions ?

(b) What are nucleotides and nucleosides ?

(c) What is denaturation of protein ?

(d) What is PVC ? (2+2)+2+2+2

Group—C

8. Write notes on any *two* of the following : 2×5

(i) Methyl orange ;

(ii) Artificial sweeteners ;

(iii) Chloroquinone ;

(iv) Peptide bond.

বঙ্গানুবাদ

দক্ষিণ প্রান্তস্থ সংখ্যাগুলি প্রশ্নমান নির্দেশক।

পরীক্ষার্থীদের যথাসম্ভব নিজের ভাষায় উত্তর দেওয়া প্রয়োজন।

বিভাগ—ক

যে-কোনো *একটি* প্রশ্নের উত্তর দাও ঃ ১×১৫

১। (ক) LPG কি? পেট্রোলিয়াম থেকে কিভাবে এটি পাওয়া যায়? LPG সিলিণ্ডারে গ্যাস লিক্ কিভাবে সনাক্ত করা হয়?

(খ) সিটেন সংখ্যা কি?

(গ) কাঁচের 'nitrification' এবং 'denitrification'-এর সংজ্ঞা দাও।

(ঘ) টীকা লেখ ঃ

(অ) রাবারের ভলকানাইজেশন ;

(আ) Catalytic Cracking.

(১+২+১)+২+(২+২)+(২×২½)

২। (ক) Portland সিমেন্ট কি? কিভাবে ইহা প্রস্তুত করা হয়?

(খ) NPK সার কাকে বলে? জিপসাম থেকে কিভাবে অ্যামোনিয়াম সালফেট্ প্রস্তুত করা হয়? এই পদ্ধতির রাসায়ণিক বিক্রিয়াগুলি লেখ।

(গ) R_f গুণক কি? T.L.C. পদ্ধতিতে কিভাবে যৌগকে সনাক্ত করা হয়?

(১+৪)+(১+২+২)+(২+৩)

৩। (ক) শিল্পে কিভাবে ইউরিয়া প্রস্তুত করা হয়? পদ্ধতির একটি রেখাচিত্র দাও।

(খ) 'Hydrogenation of oil' বলতে কি বোঝ? এতে কি ধরনের রাসায়নিক পরিবর্তন ঘটে? এই পদ্ধতিতে অনুঘটকের সক্রিয়তা অশুদ্ধি দ্বারা কিভাবে নিয়ন্ত্রিত হয়?

(গ) কাঁচের 'refining' বলতে কি বোঝ?

(ঘ) 'Optical glass' ও 'Ordinary glass' মধ্যে পার্থক্য কি? নীল বর্ণের কাঁচে কি ধরনের অক্সাইড থাকে?

৫+(২+১+২)+২+(২+:

বিভাগ—খ

যে-কোনো *দুইটি* প্রশ্নের উত্তর দাও ঃ ২×১০

৪। (ক) 'Standard deviation' কি? এর সুবিধাগুলি কি কি?

(খ) 'Aspirin' প্রস্তুতির বিক্রিয়াগুলি লেখ। এর ব্যবহারগুলি উল্লেখ কর। এর কোন বিষক্রিয়া আছে কি?

(গ) 'Aldrin' এর ব্যবহার সীমিত কেন?

(২+২)+(২+১+১)+২

৫। (ক) কৃত্রিম রবার কি? এই রকমের Compounding কেন করা হয়?

(খ) প্রাকৃতিক 'food flavouring' দ্রব্যগুলি কি? এর দুটি উদাহরণ দাও।

(গ) খাদ্যকে রঙিন করার প্রয়োজন কি? 'Antioxidant' কি?

(১+২)+(২+২)+(২+১)

৬। (ক) Detergent কি? Cationic, anionic এবং neutral detergent কি? প্রত্যেক প্রকারের উদাহরণ দাও।

(খ) 'কার্বন ব্ল্যাক' কি? এটি প্রস্তুতির বিক্রিয়াগুলি লেখ।

(গ) 'Emulsifier' কি? (১+৩)+(২+২)+২

৭। (ক) বিভিন্ন ধরনের RNA অণুগুলির নাম লেখ। এদের কার্যকারিতা উল্লেখ কর।

(খ) 'Nucleotides' এবং 'Nucleosides' কি?

(গ) প্রোটিনের 'denaturation' বলতে কি বোঝ?

(ঘ) 'PVC' কি? (২+২)+২+২+২

বিভাগ—গ

৮। যে-কোনো *দুইটির* উপর টীকা লেখ ঃ ২×৫

(অ) মিথাইল অরেঞ্জ ;

(আ) Artificial Sweeteners ;

(ই) ক্লোরোকুইন ;

(ঈ) পেপটাইড্ বন্ধন।

NEW

Part-III 3-Tier

2017

CHEMISTRY

(General)

PAPER—IVB

(PRACTICAL)

Full Marks : 50

Time : 4 Hours

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

Answer any *one* question from *Q.1. to Q.4.* through lottery.

1. (a) Prepare a 250 ml standard $\left(\frac{N}{10}\right)$ $K_2Cr_2O_7$ solution by weighing a chemical balance. 5

(b) Determine the strength of a given $Na_2S_2O_3$ solution with standard $K_2Cr_2O_7$ solution. 5

(c) Estimate the percentage (%) of copper in the supplied sample of brass with standard $Na_2S_2O_3$ solution. 20

2. (a) Prepare a 250 ml standard $\left(\frac{M}{50}\right)$ $ZnSO_4.7H_20$ solution in a chemical / digital balance. 5

(b) Standardise the supplied EDTA solution with standard $ZnSO_4.7H_2O$ solution. 5

(c) Estimate the total hardness of water in ppm in a supplied unknown hard water marked 'V' by titration with standard EDTA solution. 20

3. (a) Prepare a 250ml approx. 0.1(N) standard Sodium Oxalate solution by accurate weighing in a chemical / digital balance. 5

(b) Weigh accurately 0·2 gm pyrolusite supplied to you in a chemical balance. 5

(c) Estimate the percentage (%) of available oxygen in the pyrolusite sample by titration with standard $KMnO_4$ solution. 20

4. (a) Prepare a 250 ml 0.05(N) $K_2Cr_2O_7$ solution by accurate weighing in an analytical balance. 6

(b) Weigh out accurately 1gm cement supplied to you in an analytical balance. 4

(c) Find out the percentage of Fe_2O_3 in the supplied cement sample by titration with standard $K_2Cr_2O_7$ solution. 20

5. Laboratory Note Book. 10

6. Viva-Voce. 10

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CHEMISTRY

(General)

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(PRACTICAL)

Full Marks : 50

Time : 4 Hours

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[Instructions to the Examiners for the evaluation of the answer scripts]

1. Accurate weight should be taken upto four decimal places. Deduct one mark for weight taken > ± 0·1000 gm. Type of balance used must be mentioned.

   (Weight recorded should be checked and signed by one examiner.)

   The Mark should be distributed as :

   (a) Name of the balance — 01

   (b) Weight taken — Rest amount of marks noted in Question Paper.

2. Results (Calculate upto four decimal places) :

Error upto ± 1%	—	20 Marks
Error upto > 1–2%	—	17 "
" " > 2–3%	—	14 "
" " > 3–4%	—	10 "
" " > 4–6%	—	8 "
" Error > 6%	—	0 "

[for wrong or no calculation deduct two marks]

3. Viva-voce should be taken on five questions from practical course and that should be recorded inside the answer scripts. Special care may be taken in awarding above 70% marks. 10

4. Laboratory Note Book should contain the experiments of full syllabus with signatures at regular intervals. 10

5. Marks should be awarded in the strength of the secondary solution separately for Tabullar form and accurate titre values depending an experiment concerned. 2+3

[General Instruction]

1. A copy of the Examination programme mentioning names of Internal and External Examiners may be sent to the Head Examiner for his record.

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

3. Examiners are requested to prepare three different solution for at least 20 students in a particular group. Each candidate should be supplied with 150ml of unknown solution in the bottle marked with 'V'.

4. Experimental procedure for titration may be supplied to the students on the black-board. Students need not write experimental procedure in the answer scripts.

5. 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. Tampered or over-written values are not accepted.

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

7. Examiners are requested to send the examined scripts along with key, award-lists, distribution record and top-sheet showing the candidates presence and absence, to the Head-Examiner positively within 7 days after the examination of the centre is over.

8. T.A Bill & remuneration Bill for examiners may be sent to the H.E. in separate envelopes.

9. Care should be taken to check the Examiner's signature in the examined scripts and award-list.
