

123

I

Total No. of Questions—21

Total No. of Printed Pages—3

Regd. No.

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Part III
CHEMISTRY
Paper I
(English Version)

Time : 3 Hours

Max. Marks : 60

Note :— Read the following instructions carefully :

- (i) Answer ALL the questions of Section A. Answer ANY SIX questions in Section B and ANY TWO questions in Section C.
- (ii) In Section A, questions from Sr. Nos. 1 to 10 are very short answer type. Each question carries TWO marks. Every answer may be limited to 2 or 3 sentences. Answer ALL these questions at one place in same order.
- (iii) In Section B, questions from Sr. Nos. 11 to 18 are of short answer type. Each question carries FOUR marks. Every answer may be limited to 75 words.
- (iv) In Section C, questions from Sr. Nos. 19 to 21 are of long answer type. Each question carries EIGHT marks. Every answer may be limited to 300 words.
- (v) Draw labelled diagrams wherever necessary for questions in Section B and Section C.

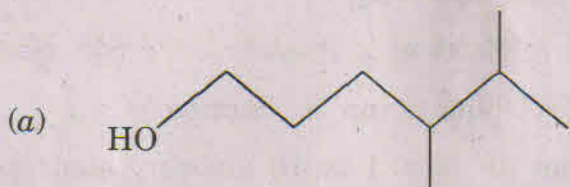
SECTION A

10×2=20

Note :— Answer ALL questions.

1. Define COD and BOD.
2. Define 'Basicity' of acid and 'Acidity' of base.

3. What are 'open' and isolated systems ?
4. Calculate kinetic energy of 5 moles of nitrogen at 27°C.
5. What is green-house effect*?
6. State Hess's law of constant heat summation.
7. What is heterogeneous equilibrium ? Write *one* heterogeneous reaction with example.
8. Which of the alkali metals shows abnormal density ? What is the order of the variation of density among the IA group elements ?
9. Why are IA group elements called alkaline metals ?
10. Write the IUPAC names of :



SECTION B

6×4=24

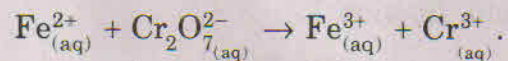
Note :— Answer any SIX questions.

11. Define :

- (a) rms
- (b) average
- (c) most probable speeds of gas molecules.

Give the ratio of above speeds of gas molecules.

12. Balance the following redox reactions by ion-electron method in acidic media :



13. Calculate the pH of the following basic solutions :

- (a) $[\text{OH}^-] = 0.05 \text{ M}$
- (b) $[\text{OH}^-] = 2 \times 10^{-4} \text{ M}$

14. Explain the hybridization of 'P' involved in PCl_5 molecule.
15. Explain *two* oxidising and *two* reducing properties of H_2O_2 with equations.
16. Explain the following :
 - (a) Graphite is a good conductor.
 - (b) Diamond has high melting point.
17. Explain the factors favourable for the formation of cation in Ionic Bond.
18. How is diborane prepared ? How does it react with ammonia ? Give equation.

SECTION C

2×8=16

Note :— Answer any TWO questions.

19. Write the postulates of Bohr's model of hydrogen atom. What are the limitations of Bohr's model of an atom ?
20. Define IE_1 and IE_2 . Why is $\text{IE}_2 > \text{IE}_1$ for a given atom ? Discuss the factors that affect IE of an element.
21. Prepare benzene from acetylene. Write equation. Explain the Friedel-Craft's alkylation, Friedel-Craft's acylation sulphonation reaction of benzene.