SERIES—A		A—555—A

[Time Allowed : 3 Hours] **[Maximum Marks : 60**

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

Marks allotted to each question are indicated against it.

Special Instructions :

(i) *You must write Question Paper Series in the circle at the top left side of title page of your Answer-book.*

(ii) *While answering your Questions, you must indicate on your Answer-book the same Question No. as appears in your Question Paper.*

(iii) *Do not leave blank page/pages in your Answer-book.*

(iv) *All questions are compulsory. Internal choices have been given in some questions.*

(v) *Question Nos. 1 to 6 are multiple choice type questions (MCQ) carrying 1 mark each. Choose one correct answer among four options.*

(vi) *Question Nos. 7 to 10 are very short answer type questions carrying 1 mark each. Answer these questions in about one word or in one sentence.*

(vii) *Question Nos. 11 to 17 are short answer type questions carrying 2 marks each. Answer these questions in about 30 words each.*

(viii) *Question Nos. 18 to 25 are short answer type questions carrying 3 marks each. Answer these questions in about 40 words each.*

(ix) *Question Nos. 26 to 28 are long answer type questions carrying 4 marks each. Answer these questions in about 50 words each.*

1. Which of the following is not antipyretic : 1

    (a) Paracetamol (b) Aspirin

    (c) Chloramphenicol (d) Phenocetin.

2. Colligative property of dilute solutions depend on : 1

    (a) the nature of solute

    (b) the nature of solvent

    (c) the number of particles of solute

    (d) the number of particles of solvent.
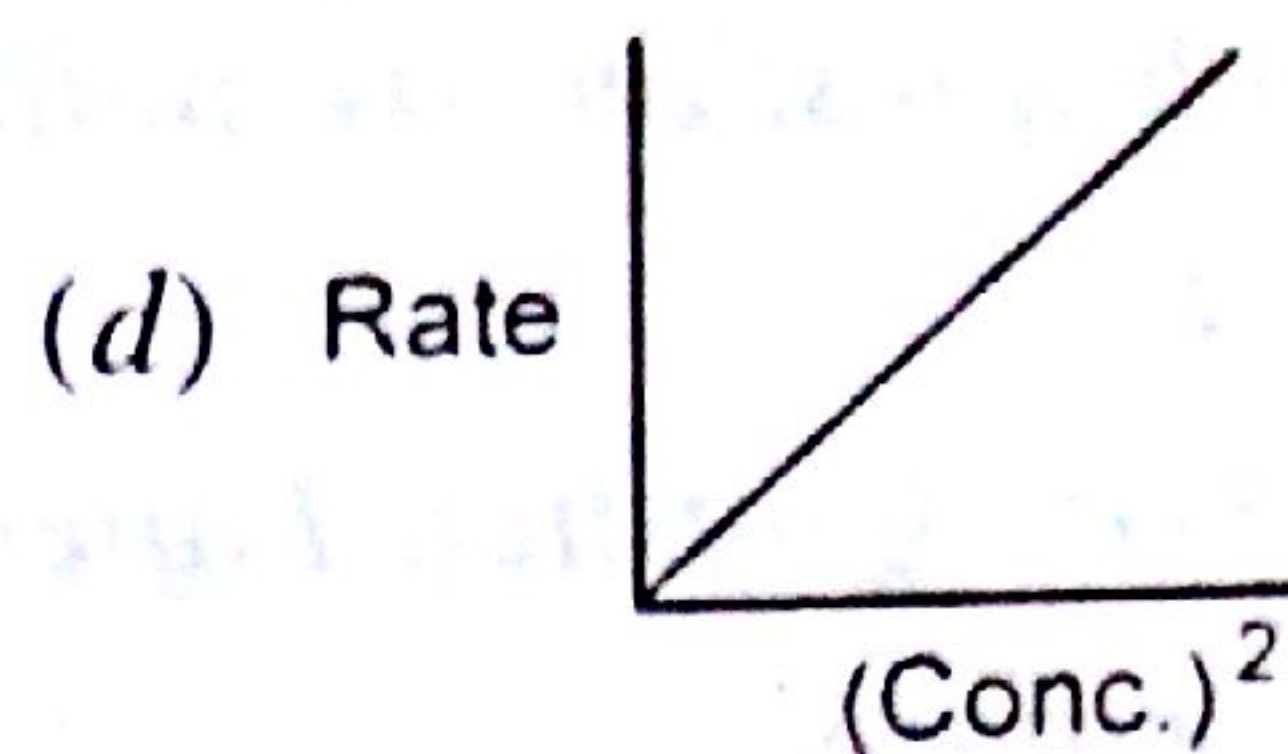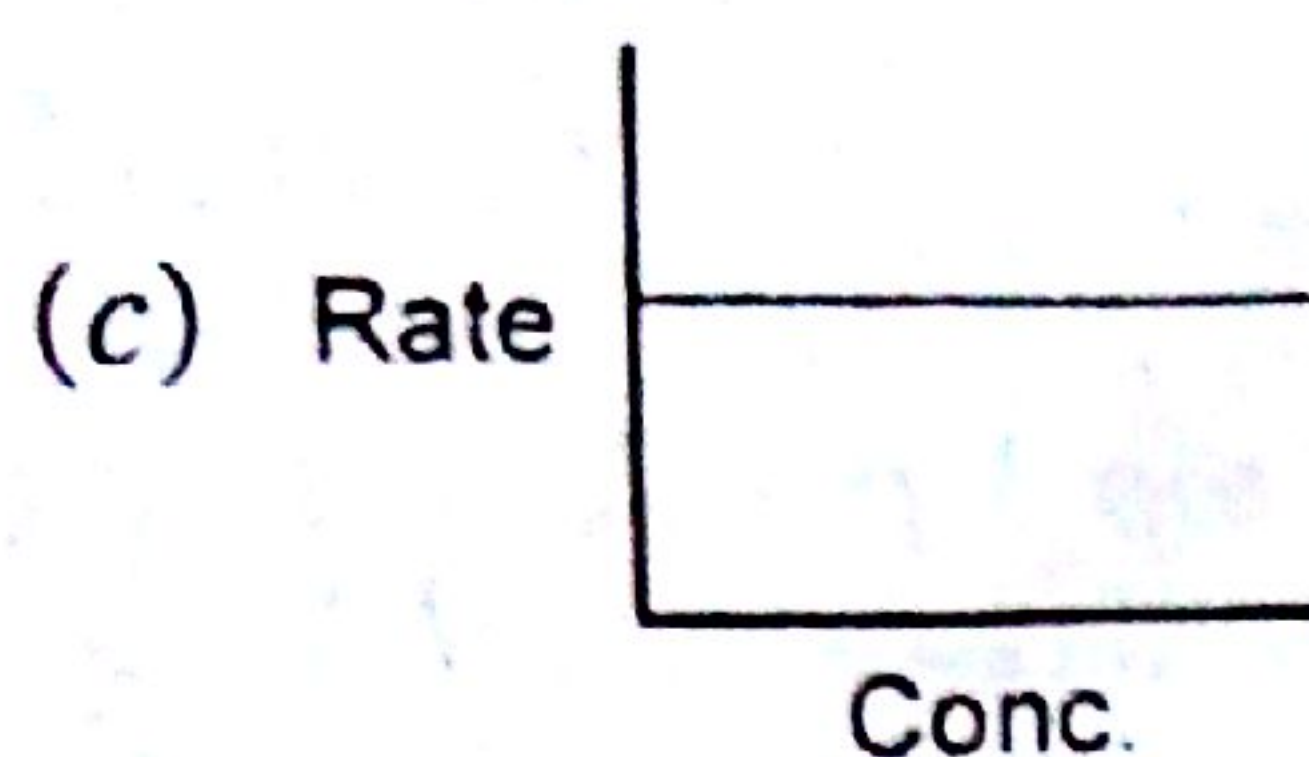
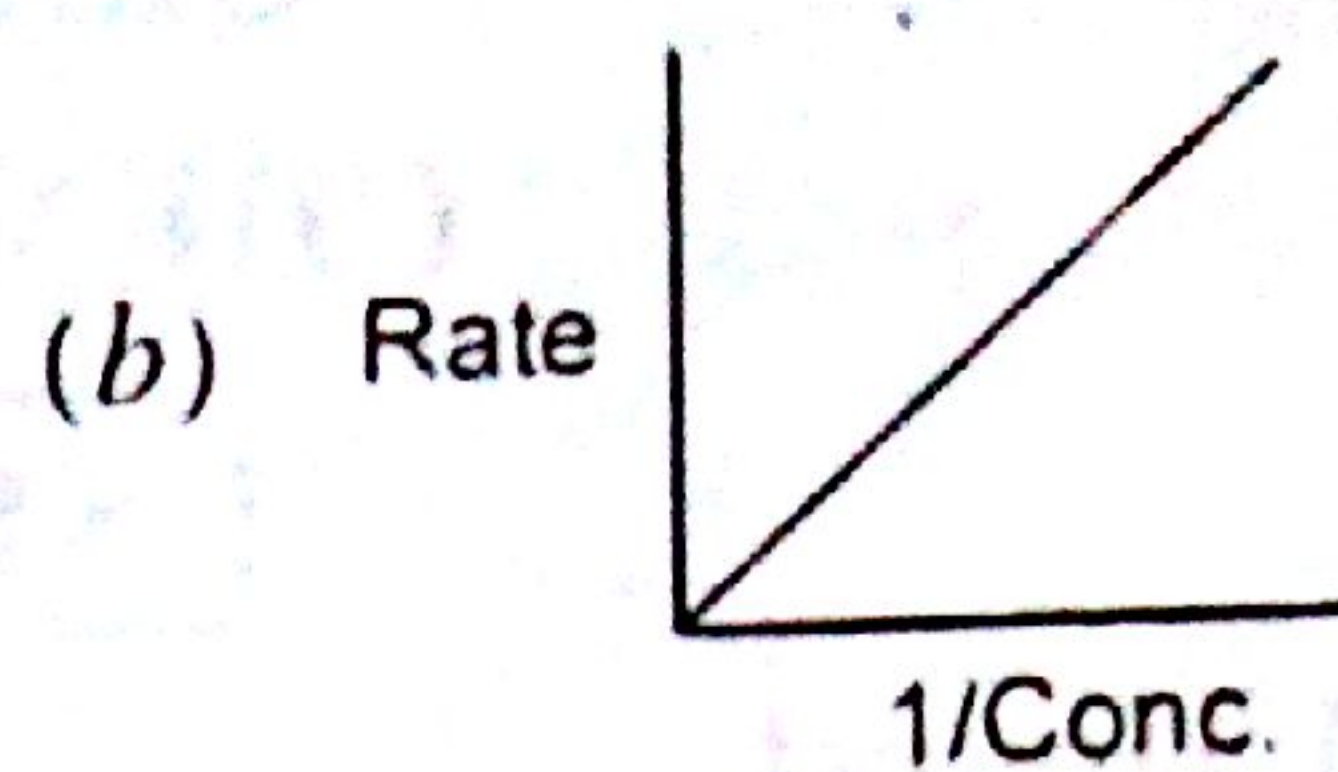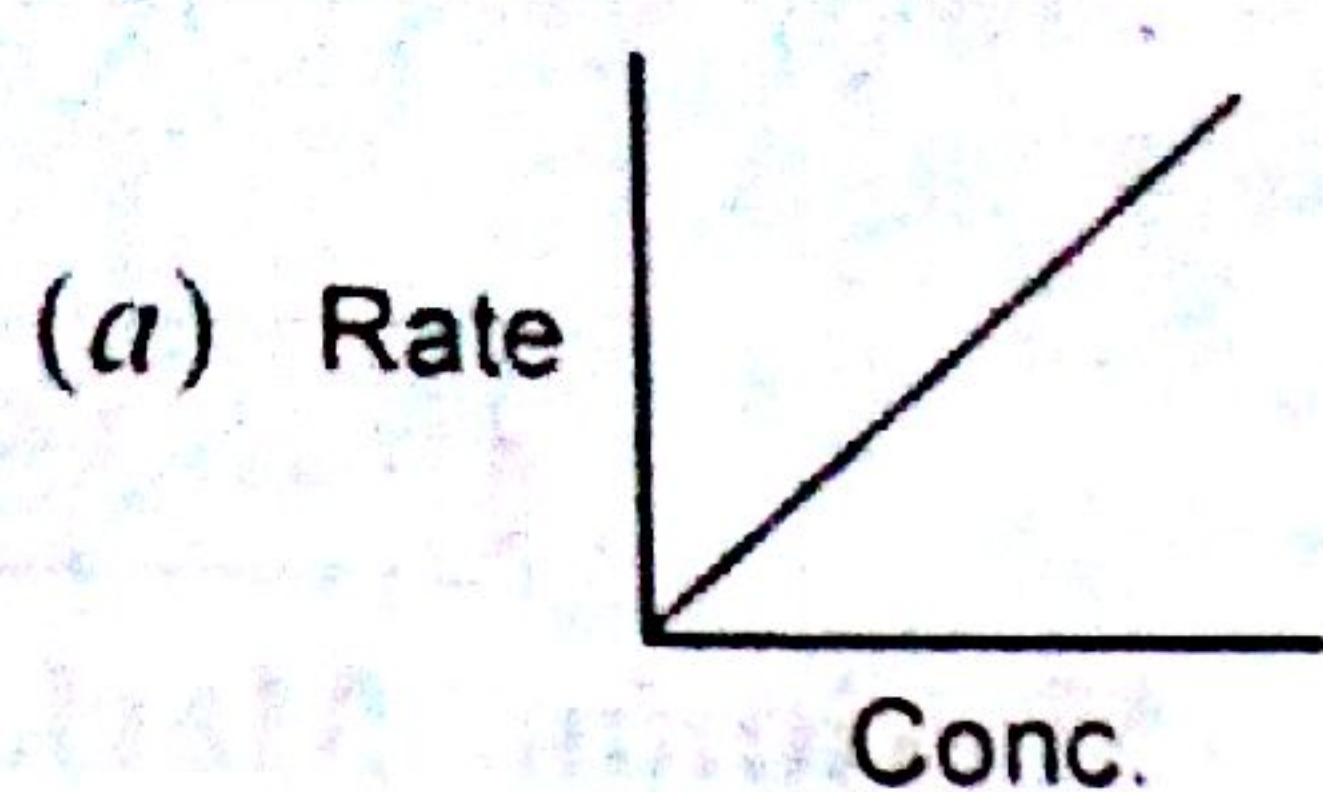3. The halogen with highest negative electron gain enthalpy : 1

    (a) F (b) Cl

    (c) Br (d) I.

4. The units of conductivity are : 1

    (a) ohm $^{-1}$ (b) ohm $^{-1}$ cm $^{-1}$

    (c) ohm $^{-2}$cm^3 equiv $^{-1}$ (d) ohm^{-1}cm^2.

5. Which of the following graphs corresponds to first order reaction :

(a) Rate — Conc.

(b) Rate — 1/Conc.

(c) Rate — Conc.

(d) Rate — (Conc.)^2

6. Write the I.U.P.A.C. name of the $[K_3[Fe(CN)_5NO]$ 1
    (a) Potassium pentacyanonitrosyl ferrate (II)
    (b) Potassium penta cyanonitrile (II)
    (c) Potassium penta cyanonitrosyl ferrate (III)
    (d) None of these.

7. Define metallic conductors.   1

8. Name the type of emulsion to which milk belongs to.   1

9. Write the general electronic configuration of f-Block elements.   1

10. What are elastomers ?   1

11. Give differences between calcination and roasting.   2

12. Give the explanation that primary amines have higher boiling point than tertiary amines.   2

13. Ionic solid conduct electricity in molten state but not in solid state. Explain.   2

14. Comment on the statement that colloid is not a substance but it is state of substance.   2

15. Prove that relative lowering in the vapour pressure of a liquid on addition of non-volatile solute is a colligative property.   2

16. Define crystal field splitting energy. Give the number of unpaired electrons in $[Fe(CN)_6]^{4-}$.   2

17. What happens when ice cold solution of benzene diazonium chloride is treated with aniline ? Give chemical reaction also.   2

18. (a) Rate constant for a first order reaction is 60 s^{-1}. How much time will it take to reduce the concentration of the reaction to $\frac{1}{10}$ th of its initial value ?   2

    (b) What are the isotonic solutions ? Explain with the help of example.   1

Or

    (a) What are zero order reactions ? Derive integrated rate equation for zero order reaction.   2

    (b) Define azeotropes.   1

19. Write short notes on the following :
    (a) Williamson's synthesis reaction.
    (b) Sandmeyer's reaction.   1
    (c) Hunsdiecker reaction.   1
             1

20. (a) What is co-enzyme ? Give one example.   1
    (b) What are constituents of starch ?   1
    (c) What is a nucleotide ?   1

21. (a) What is tailing of mercury ?   1
    (b) Define term catenation.   1
    (c) Why yellow phosphorus is kept under water ?   1

Or

(a) Why ammonia is a good complexing agent ?   1
(b) Give the structure of $XeOF_2$.   1
(c) Define inert pair effect.   1

22. (a) Name two artificial sweeteners used in food materials.   1
    (b) What is vulcanization of rubber ? What are the advantages of vulcanized rubber ?

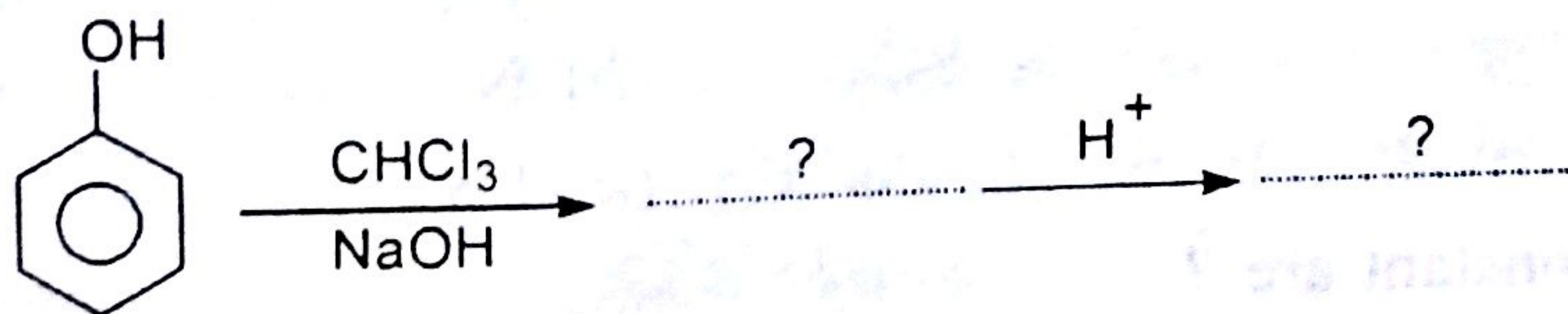23. (a) Write short note on :
         (i) Carbyl amine reactions.
         (ii) Hoffmann bromamide reaction.   2
    (b) Define rate constant.   1

24. (a) Write a short note on H.V.Z. reaction.   1
    (b) How will you convert benzoic acid to ethyl benzoate ?   1
    (c) Complete the following reaction :

   2

25. (a) Distinguish between e.m.f. and potential difference.   1
    (b) Name the transition element which does not exhibit variable oxidation state.   1

26. (a) Account for the following :
         (i) Transition metals exhibit variable oxidation state.   1
         (ii) Why zinc, cadmium, and mercury are not considered as transition elements ?   1
         (iii) What is the cause of lanthanoid contraction ?   1
    (b) What are f centres ?   1

Or

(a)   (i) How $K_2Cr_2O_7$ is prepared from chromite ore ?   2
     (ii) What is effect of heating on $K_2Cr_2O_7$?   1
(b) Define anisotropy.   1

27. Account for the following :

    (a) Alcohols are comparatively more soluble in water than hydrocarbons of comparable molecular mass.   2

    (b) What is Galvanisation ?   1

    (c) Esterification reaction.   1

28. (a)   (i) Define allotropy.   1

        (ii) SF_6 is known but SCl_6 is not known. Explain.   1

    (b)   (i) How will you convert ethanal to methanal ?   1

        (ii) Formic acid is stronger acid than acetic acid. Justify.   1

SERIES—B

A—555—B

Time Allowed : 3 Hours]　　　　　　　　　　　**[Maximum Marks : 60**

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

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1. Which of the following is not an antibiotic ?   1

    (a) Chloramphenicol   (b) Sulphadiazine

    (c) Penicillin   (d) Bithional.

2. Which of the following is not a colligative property ?   1

    (a) Depression in the freezing point

    (b) Elevation in the boiling point

    (c) Optical activity

    (d) Relative lowering in the vapour pressure.

3. Which of the following has highest ionisation enthalpy ?   1

    (a) P   (b) N

    (c) As   (d) Sb.

4. Units of the cell constant are ?   1

    (a) $ohm^{-1}cm^{-1}$ (b) cm

    (c) $ohm^{-1}cm$ (d) cm^{-1}.

5. Rate constant depends upon :   1

    (a) temperature   (b) time

    (c) initial concentration   (d) None of these.   1

6. Write the I.U.P.A.C. name of the $[CoCl_2(NO_2)(NH_3)_3]$:   1

    (a) Triammine dichloridonitrito-N-cobalt (III)

    (b) Dichlorotriamminenitrito-N cobalt (III)

    (c) Dichlorotriamminenitrito-N cobalt (II)

    (d) None of these.

7. Define the term doping.   1

8. Name the type of emulsion to which butter belongs to.   1

9. What is the most common oxidation state in the actinoids ?   1

10. Define thermosetting polymers. 1

11. (a) What is flux ?

    (b) Give the composition of German silver. 1, 1

12. Explain why aniline is less basic than ethyl amine ? 2

13. Define :

    (i) Diamagnetism.

    (ii) Space lattice. 1, 1

14. Sodium chloride solution freezes at lower temperature than water but boils at higher temperature than water. Explain. 2

15. Write a short note on Tyndall effect. 2

16. Explain the geometry and magnetic behaviour of $[CO(NH_3)_6]^{3+}$ ion on the basis of Valence Bond Theory. 2

17. What happens when ethylamine is warmed with chloroform and alcoholic KOH ? 2

18. (a) A first order reaction is 15% complete in 20 minutes. How long will it take to complete 20% ? 2

    (b) What are hypertonic solutions ? Explain with the help of example ? 1

Or

    (a) How can you say that half life period for a first order reaction is independent of initial conc. of reactants ? 2

    (b) Define Henry's law. 1

19. Write short notes on the following :

    (a) Wurtz reaction. 1

    (b) Finkelstein reaction. 1

    (c) Saytzeff's Rule. 1

20. (a) What is denaturation of protein ? 1

    (b) What type of bonds hold a DNA double helix together ? 1

    (c) Which enzyme is present in saliva ? What is its function ? 1

21. (a) Define the term pseudo halogens.

    (b) NF_3 does not have donor properties like ammonia. Explain.

    (c) Which is stronger acid in aqueous solution, HCl or HBr and why ? 3

Or

Describe the electrolytic process for manufacture of chlorine. 3

22. (a) What is the role of bithional in the toilet soap ? 1

    (b) What are biodegradable polymers ? Give two examples. 2

23. (a) What do you understand by SHE ? Give its structure and working. 2

    (b) A reaction is found to be zero order. Will its molecularity be also zero ? 1

24. (a) Write a short note on Cannizzaro's reaction ? 1

    (b) How will you convert ethanal to propanal ? 1

    (c) Complete the reaction 1

$$CH_2 = CH_2 + O_3 \longrightarrow ? \xrightarrow[-H_2O]{H_2O, Zn} ?$$
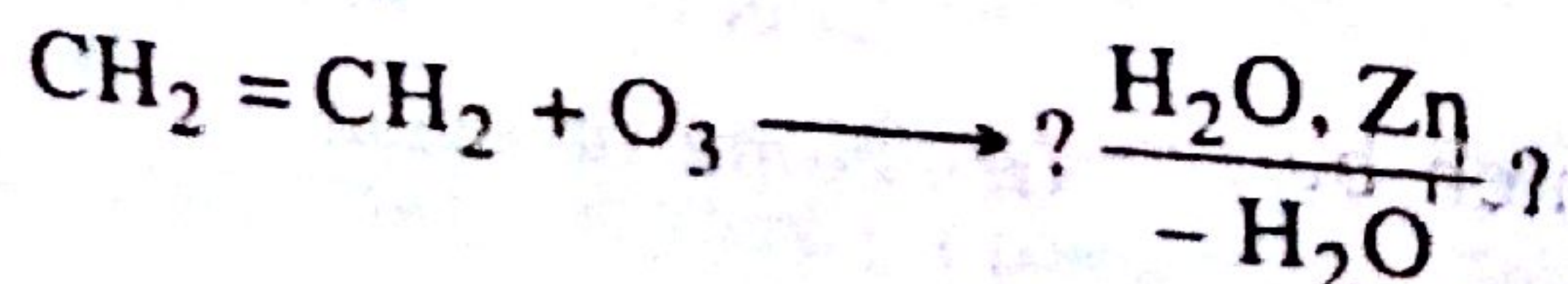
25. (a) What is electrochemical series ? Discuss any two applications of electrochemical series.　　2

　　(b) Give the preparation of D.D.T.　　1

26. (a) Account for the following :

　　(i) $Li(OH)_3$ is more basic than $Lu(OH)_3$.　　1

　　(ii) + 2 oxidation state of manganese is quite stable while same is not true for iron.　　1

　　(iii) The transition elements have high melting points.　　1

　　(iv) Transition elements form alloys.　　1

Or

　　(i) How is $KMnO_4$ prepared from pyrolusite ore ?　　2

　　(ii) Write two similarities between lanthanides and actinides.　　1

　　(iii) Out of V (IV) and V (V) which one is paramagnetic and why ?　　1

27. Discuss the following :

　　(a) Phenols are acidic while alcohols are not even though both have – OH group.　2

　　(b) How will you convert phenol to salicylic acid ?　　1

　　(c) Schotten Baumann Reaction.　　1

28. (a) (i) Electron gain enthalpies of halogens are highest. Explain.　　1

　　(ii) White phosphorus is more reactive than red phosphorus.　　1

　　(b) (i) What do you understand by the trans esterification reaction ?　　1

　　(ii) Ethanoic acid is weaker acid than benzoic acid.　　1

SERIES—C　　　　A—555—C

Time Allowed : 3 Hours]　　　　**[Maximum Marks : 60**

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Marks allotted to each question are indicated against it.

1. Which of the following is used as analgesic :　　1

　(a) Naproxen　　　　　　　　(b) Sulphodiazine

　(c) Diclofenac Sodium　　　　(d) Serotonin.

2. The boiling point of a solvent containing non-volatile solute :　　1

　(a) is depressed　　　　　　　(b) is elevated

　(c) does not change　　　　　(d) None of these.

3. General electronic configuration of elements of group 16 is :　　1

　(a) ns^2np^6　　　　　　　　(b) ns^2np^4

　(c) ns^2np^5　　　　　　　　(d) ns^2np^2.

4. For one mole of electrolyte which of the following increases with dilution ?　　1

　(a) Resistance　　　　　　　　(b) Specific conductance

　(c) Molar conductance　　　　(d) None of these.

5. Arrhenius equation is :
   (a) $k = -Ae^{-Ea/RT}$
   (b) $k = Ae^{-Ea/RT}$ 1
   (c) $k = e^{-Ea/RT}$
   (d) $k = Ae^{Ea/RT}$.

6. What is the I.U.P.A.C. name of $K_4[N_1(CN)_4]$?   1
   (a) Potassium tetracyanonickelate (II)
   (b) Potassium tetracyanonickelate (III)
   (c) Potassium tetracyanonickelate (O)
   (d) None of these.

7. What are the ferromagnetic substances ?   1
8. Name the emulsion to which cold cream belongs to.   1
9. What is the most common oxidation state in the lanthanoids ?   1
10. Define thermoplastics.   1
11. Differentiate between minerals and ores.   2
12. Give plausible explanation that aliphatic amines are stronger bases than ammonia.   2
13. Electrical conductivity of metals decreases with rise in temperature while that of semi-conductor increases. Explain.   2
14. When dehydrated fruits and vegetables are placed in water they slowly swell and return to original form. Why ? What is the effect of temperature on the process ? Explain.   2
15. Write a note on cleansing action of soap.   2
16. What is ligand ? Give the example of unidentate and polydentate ligand.   2
17. What happens when benzamide is treated with Br_2 and KOH ? Give chemical reaction.   2

18. (a) A first order reaction is 20% complete in 10 minutes. Calculate the time for 75% completion of the reaction.   2
   (b) Define term reverse osmosis with suitable examples.   1

Or

   (a) Derive Integrated rate law for first order reaction.   2
   (b) Define Raoult's law.   1

19. Write short notes on the following :
   (a) Kolbe's Reaction.   1
   (b) Markownikov's Rule.   1
   (c) Diazotisation Reaction.   1

20. (a) Define the term Genetic code.   1
   (b) What type of forces are responsible for the formation of β-sheet structure ?   1
   (c) What are reducing sugars ?   1

21. (a) Define inert pair effect.   1
   (b) Why halogens are coloured ?   1
   (c) Fluorine always shows−1 oxidation state in its compounds.

Or   3

Describe the Ostwald's process for the manufacture of Nitric acid.

22. (a) Name a substance which can be used as an antiseptic as well as disinfectant.

(b) Distinguish between the term homopolymer and copolymer with suitable example

23. (a) What are the fuel cells ? Discuss $H_2 - O_2$ fuel cell. List two advantages of fu cell.

(b) Define pseudomolecular reactions.

24. (a) Write a short note on Rosenmund's reaction.

(b) How will you convert benzoic acid to benzaldehyde ?

(c) Complete the following reaction :

$$CH_3CH_2OH + [O] \xrightarrow[H_2SO_4]{K_2Cr_2O_7} ? + ?$$
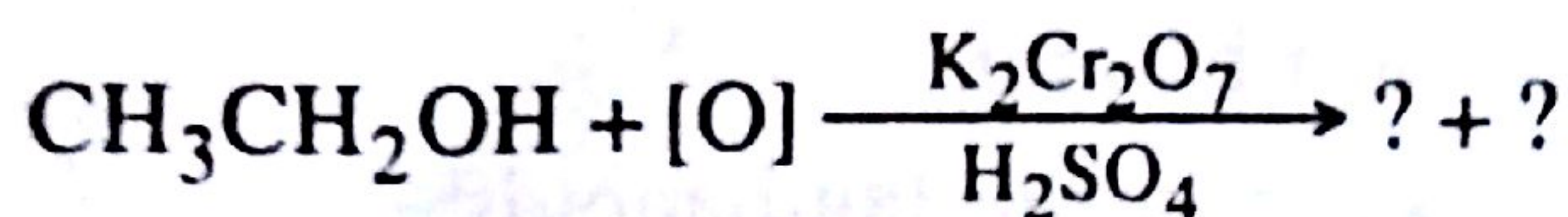
25. (a) Explain the term strong electrolytes and weak electrolytes with the help of suitabl examples.

(b) Why are the Ionisation energies of 5d elements greater than 3d elements ?

26. (a) Account for the following :

(i) Zn^{2+} salts are white, Cu^{2+} salts are blue.

(ii) Actinoids have greater tendency for complex formation than lanthanoids Why ?

(iii) Second and third member of each group of transition elements have the same atomic radii.

(b) Define Anti-Markownikov's Rule.

Or

(i) Draw a structure of dichromate ion and write any two oxidation reaction of potassium dichromate. 3

(ii) Convert aniline into chlorobenzene. 1

27. Account for the following :

(a) Out of phenol and benzene which is more easily nitrated and why ? 2

(b) How will you convert benzene diazonium chloride to phenol ? 1

(c) Friedel-Crafts alkylation reaction. 1

28. (a) (i) What is laughing gas ? 1

(ii) Why the zero group elements are inert ? 1

(b) (i) What is glacial acetic acid ? Why it is so named ? 1

(ii) Chloroacetic acid is stronger acid than acetic acid. 1