

(i) Printed Pages :4]

Roll No.

(ii) Questions :9]

Sub. Code :

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Exam. Code:

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B.A./B.Sc.(General) 6th Semester Examination

1047

CHEMISTRY

(Organic Chemistry-B)

(Same for B.Sc. Microbiol & Food tech.)

Paper - XXII

Time : 3 Hours]

[Max. Marks : 22

Note :- Attempt five questions in all including Q. No. 1 which is compulsory and taking at least one question from each Unit I-IV.

1. (a) Silicons contain

Fill the blank selecting correct answer below :

- (i) Only Si-O-Si bonds
- (ii) Only Si-C bonds
- (iii) Two Si-O-Si bonds and two Si-C bonds
- (iv) Three Si-O-Si bonds and one Si-C bonds.

1

(b) There are two set of cations and anions (Ca^{+2} , Hg^{+2} , and F^- and CN^-) in solution. Using HSAB principle, write the best combination salts will form from the ions. 1

(c) Write the correct base strength order of these amines (NH_3 , $(\text{CH}_3)_2\text{NH}$, and $(\text{CH}_3)_3\text{N}$) in both gas phase and aqueous solution phase. 1

(d) Crystal field symbol for the ground state of $[\text{Mn}(\text{CN})_6]^{4-}$ is :

(i) ${}^2\text{T}_{2g}$

(ii) ${}^1\text{A}_{1g}$

(iii) ${}^5\text{E}_g$

(iv) A_{1g}

1

(e) Which of the following ion is expected to show $\mu_{\text{S.O.}}$ close to 2-84 B.M.

(i) V^{3+}

(ii) Mn^{3+}

(iii) Fe^{2+}

(iv) Cu^{2+}

1

(f) Find the suitable configuration of the following, which will not have orbital contribution in tetrahedral geometry?

(i) d^2

(ii) d^4

(iii) d^8

(iv) d^9

1

Unit-I

2. Discuss various classification of Silicones with two important preparations. 4
3. What are triphosphazenes ? Explain the nature of bonding in triphosphazenes with suitable examples. 4

Unit-II

4. Hydrogen fluoride (HF) acts as an acid in anhydrous sulfuric acid and as a base in liquid ammonia. Explain the above fact with suitable explanation. 4
5. Pyridine forms a weaker complex with SP_6 than with SF_4 . Explain the difference. 4

Unit-IV

6. $[CoCl_4]^{2-}$ is a blue color complex, while $[Co(H_2O)_4Cl_2]$ is a pink. Write the complete Orgel diagram for both the complexes and explain the cause of colour variation among them. 4
7. Discuss different types of selection rule applicable for d-d transitions, taking comparison of tetrahedral and octahedral complex as a case study. 4

Unit-IV

8. The complex $[\text{NiCl}_4]^{2-}$ is paramagnetic having two unpaired electrons while $(\text{Ni}(\text{CN})_4)^{2-}$ is diamagnetic. Explain these above facts and predict the structures of the two complexes. 4
9. What is orbital contribution of magnetic moments? Explain how it helps in predicting the structure of 3d-metal complexes. 4