

## **Annexure "B"**

### **Syllabus for Chemical Assistant**

**Total Marks 120**

**Time 2 Hours**

#### **Part-I: 16 Marks**

1. Definition of Museum, Museology and Museography.
2. History and development of Indian Museum.
3. Museum Collection.
  - a. Primary source
  - b. Secondary source
  - c. Documentation system
  - d. Catalogue
  - e. Exhibition
4. What is documentation system?
5. Museum as an educational-research institution.
6. Communication policy of the Museum.
7. Importance of design of Museum galleries and Museum building.
8. Museum as an agency of non-formal education

#### **Part-II: 8 Marks**

##### **Stereochemistry:**

Elements of symmetry, Chirality due to chiral centre, molecules with more than one Chiral centre, threo and erythro isomers optical activity in the absence of chiral carbon (biphenyls, allenes and spirans). Chirality due to helical shape. Enantiotropic and diastereotropic atoms, groups and faces. Conformational analysis of cycloalkanes and decalines. Effect of conformation and reactivity in acyclic and cycloalkanes. Conformation of sugars, steric strains due to unavoidable crowding.

#### **Part-III: 8 Marks**

##### **Reaction Mechanism/Structure and reactivity**

Types of mechanisms. Types of reactions, thermodynamic and kinetic requirements, Methods of determining reaction mechanism, isotope effects. Effect of structure on reactivity: Resonance and field effects, steric effect, quantitative treatment. The Hammett equation and linear free energy relationship, substituent and reaction constants. Taft equation.

#### **Part-IV: 8 Marks**

##### **Aliphatic Electrophilic substitutions**

General mechanism of SE1, SE2 and SEi reactions, Mechanism of reactions involving migration of double bond. Effect of substrate, leaving group and solvent on reactivity. Stork-enamine reaction.

**Part-V: 8 Marks****Aliphatic Nucleophilic substitutions**

Mechanisms and stereochemical implications of SN<sub>2</sub>, SN<sub>1</sub>, SN<sub>i</sub> and neighbouring group participation (by double and single-bonds) reactions. Effect of substrate structure attacking nucleophile, leaving group and solvent on the rates of SN<sub>1</sub> and SN<sub>2</sub> reactions. Mixed SN<sub>1</sub> and SN<sub>2</sub> reactions. Nucleophilic substitution at allylic, aliphatic trigonal and vinylic carbon.

**Part -VI 8 Mark****Elimination reactions:**

Discussion of E<sub>1</sub>, E<sub>2</sub>, E<sub>1cB</sub> and E<sub>2c</sub> mechanisms. Effect of substrate structure base and the leaving group on reactivity. Competition between substitution and elimination reactions, Stereochemistry and orientation of E<sub>2</sub> elimination. Mechanism and orientation in pyrolytic eliminations, Shapiro reaction.

**Part-VII 8 Marks****Aromatic Nucleophilic substitution**

Discussion of different mechanism (SN<sub>1</sub>:SN<sub>Ar</sub>, Benzyne and srn!) structure reactivity relationships. Effect of leaving group and attacking nucleophile.

**Part-VIII: 8 Marks****Free Radical Substitution**

Free radical substitution mechanisms. Mechanism at an aromatic substrate, neighboring group assistances, reactivity for aliphatic and aromatic substrates. Reactivity in the attacking radical. Effect of solvent on reactivity. Allylic alogenations (NBS), oxidation of aldehydes to carboxylic acids, auto-oxidation, coupling of alkynes and arylation of aromatic compounds by diazonium salts.

**Part-IX: 24 Marks****I). Preventive conservation in terms of:**

1. Light
2. Insects
3. Fungus
4. Atmosphere
5. Pollution

**II). Curative Conservation**

01. Conservation of coins-copper, silver and gold.
02. Conservation of military/warfare equipment's-swords, guns etc.
03. Basic conservation of textile objects like cleaning, darning, lining etc.

04. Basic Conservation of stuffed birds/animals-natural history collection.

**Part-III). 8 Marks**

How to make a condition report?

Basic things to keep in mind during conservation

**General Knowledge: 16 Marks**

1. What is Preventive conservation?
2. What is curative conservations?
3. What is conservation
4. What is archaeology?
5. What is archives? When was achieves established in J&K?
6. What is museum?
7. When was SPS museum Srinagar established? Give history.
8. When was Dogra art museum Jammu established?
9. When was Burzaham archaeological site excavated first?
10. How many periods are traced in Burzaham? Give their details period wise.
11. When is world Heritage Day celebrated?
12. When is world heritage week celebrated?
13. When is International museum day celebrated?
14. Define Indian treasure true act 1978/
15. Define Antiquities and Art Treasure Act 1971 AD.
16. Define Ancient Monument and Archaeological sites and remains Act 1958?
17. Define J&K Ancient monuments and preservation act 1977 (samvath).
18. How many monuments in J&K are declared as State Protected Monuments?
19. How many monuments in J&K are declared as national protected monuments and is presently under the control of ASI?
20. Where are the ancient Buddhist sites located in Jammu and Kashmir?