



- Notes :
1. All questions carry equal marks.
 2. Diagrams and chemical equation should be given wherever necessary.
 3. Illustrate your answers wherever necessary with the help of neat sketches.
 4. Q. 1 is compulsory solve **any four** from remaining.

1. Answer the following question **any two**. **16**
 - a) Describe the biosynthetic pathway for Tropane alkaloid.
 - b) Describe the method of extraction isolation and identification of Ephedrine OR atropine.
 - c) Write a short note on Steroidal alkaloids.
2. Define standardization of herbal drugs. Enlist the various parameter as per WHO guideline for quality control and standardization of herbal formulation. Explain in detailed physical and chemical parameter for standardization of herbal drugs. **16**
3. a) Define alkaloids classify them with suitable examples of each class. Describe the various physical and chemical properties of alkaloids. Enlist the various chemical reagent used for the detection of alkaloids. **10**
 - b) Explain the general methods of Extraction of alkaloids from crude drug. **6**
4. a) Describe the method of extraction isolation and estimation of Quinine. **8**
 - b) Pharmacogenetic accounts on cinchona bark. **8**
5. a) What is Herbal drug interaction classify them with there possible side effects & interactions. **6**
 - b) Define flavonoids? Classify them with suitable examples of each class. Describe the General methods of extraction of flavonoids. Give the various chemical test for flavonoids. **10**
6. a) Describe the importance and problems involved in the standardization of Herbal drugs. **6**
 - b) Describe the pharmacogenetic accounts on Ergot. **10**
7. Write a short notes on **any four** of the following. **16**
 - i) Validation of herbal products.
 - ii) Guggul.
 - iii) Passiflora Incarnata.
 - iv) Opium.
 - v) Saffron.
 - vi) Shilajit
