



**MODEL ANSWER**  
**SUMMER- 17 EXAMINATION**

Subject Title: Pharmacognosy

Subject Code: **0807**

**Important Instructions to examiners:**

- 1) The answers should be examined by key words and not as word-to-word as given in the model answer scheme.
- 2) The model answer and the answer written by candidate may vary but the examiner may try to assess the understanding level of the candidate.
- 3) The language errors such as grammatical, spelling errors should not be given more Importance (Not applicable for subject English and Communication Skills).
- 4) While assessing figures, examiner may give credit for principal components indicated in the figure. The figures drawn by candidate and model answer may vary. The examiner may give credit for any equivalent figure drawn.
- 5) Credits may be given step wise for numerical problems. In some cases, the assumed constant values may vary and there may be some difference in the candidate's answers and model answer.
- 6) In case of some questions credit may be given by judgement on part of examiner of relevant answer based on candidate's understanding.
- 7) For programming language papers, credit may be given to any other program based on equivalent concept.

| Q. No. | Sub Q. N. | Answer  | Marking Scheme |
|--------|-----------|---|----------------|
| 1.     | a)        | <b>Attempt any TEN of the following : ( 2 marks each)</b><br><br><b>Define Antitussive and Antiseptics ( 1 mark each)</b><br><br><b>Antiseptics:</b> Antiseptics are the chemical sterilizing agents which are used to kill pathogenic microbes or for prevention of their growth.<br><br><b>Antitussive:</b> The agent which act on pulmonary membranes that increases the expectoration are called as antitussives or the agent which expel the bronchial mucus are called as antitussives. | <b>20M</b>     |
| 1.     | b)        | <b>What is Galenical pharmacy and who is called as 'Father of Medicine'? ( 1 mark for</b>   |                |



1. **Galenical pharmacy and 1 mark for the name )**  
 Galen was Greek pharmacist; he worked on extraction of chemical constituent from the plants. He developed various methods of extraction therefore the branch of pharmacy which deals with extraction of chemical constituent from plants & animals is called as galenical Pharmacy

1. **Hippocrates** is honoured as "Father of Medicine"

c) **Name the drug which contain: ( 1/2 mark each)**

i) **Glycyrrhizin** – Liquorice

ii) **Amylase** – Starch

iii) **D- linalool**- Coriander

iv) **Quinine**- Cinchona

1. d) **Differentiate between Roots and Rhizomes( any 2 points - 1 mark each)**

| <b>Roots</b>   | <b>Rhizomes</b>   |
|--|---|
| The roots are characterized by their downward growth into the soil | The rhizomes are characterized by their horizontal growth under the soil. |
| They do not have nodes and internodes                              | They have nodes and internodes  |
| Root cap is present at the tip of the roots                        | Root cap is absent.   |
| Ex. Rauwolfia, Aconite   | Ginger, Dioscorea, Rhubarb ,Turmeric                                      |

1. e) **Describe morphological characters of Nux vomica seed with diagram**

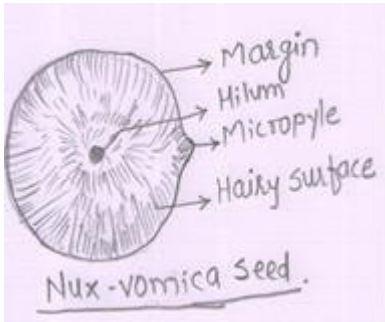
**( 1 mark each for morphological characters and diagram)**

**Colour-** Grey or greenish grey

**Odour:** odourless **Taste:** extremely bitter



**Extra features:** Surface : Silky, radially arranged, densely covered closely with unicellular covering trichomes. seeds are extremely hard



**What is the significance of 'Modified Borntrager test '? Explain how it is performed.**

1. f) (significance- 1 mark, for test- 1 mark)

**Significance :** C-glycosides cannot be hydrolyzed by acid ,so oxidative hydrolysis is required to hydrolyse the C- glycosides.

**Modified Borntrager test:**

To the 0.1g of drug add 2ml of 5% ferric chloride solution and 2ml of dil. HCL. Heat on a boiling water bath for 5mins, cool and shake it with benzene. Separate the benzene layer and add equal volume of dil. Ammonia pinkish red color is produced with all varieties of aloe.

**Mention synonyms of following drugs: (For any 1 synonym – ½ mark each)**

1. g)
- i) **Nutmeg-** Myristica/ Nux Moschata/ Jaiphal
  - ii) **Rauwolfia-**Sarpagandha / Indian Snake root/Rauwolfia root/Chhotachand/Pagla ka dawa/ Patala gandhi
  - iii) **Vasaka-** Adhatoda /Adulsa
  - iv) **Linseed-**Flax seed/Alsi /Linum

1. h) **Define: ( 1mark each)**

i) **Palisade Ratio:** It is the average number of palisade cells, beneath one epidermal cell, using four continuous epidermal cells for the count.



|    |           |  |
|----|-----------|--|
| 1. | <b>h)</b> | <b>(ii) Stomatal index</b> - It is the percentage in which the number of stomata form the total number of epidermal cells.   |
| 1. | <b>i)</b> | <b>What are the official requirements of surgical dressings?</b><br><b>Official Requirements: ( any 4 of the following - ½ mark each)</b><br>1. They should be sterile before use.<br>2. They should be stored in a dry well ventilated place at a temp not exceeding 250c.<br>3. Permitted antiseptic should be used in prescribed concentration.<br>4. Adhesive products should not be allowed to freeze.<br>5. There should not be any loose thread, fibre ends in the dressings.<br>6. They should be dyed unless mention in the monograph |
| 1. | <b>j)</b> | <b>Which part of the plant is used as drug in case of : ( ½ mark each)</b><br><b>i)Picrorrhiza-</b> Dried rhizome<br><b>ii)Amla-</b> Dried as well as fresh fruits<br><b>iii)Belladonna-</b> Dried leaves & flowering tops<br><b>iv ) Colchicum-</b> dried seeds and corm  |
| 1. | <b>k)</b> | <b>Write the biological source of : ( 1mark each)</b><br><b>i)Gymnema:</b> It consist of dried leaves of <i>Gymnema sylvestre</i> belonging to<br>Family- <i>Asclepiadaceae</i><br><b>ii) Gokhru :</b> It consists of dried fully ripen fruits of the plant <i>Tribulus terrestris</i> . Family –<br><i>Zygophyllaceae</i><br><b>OR</b><br><b>Gokhru :</b> It consists of dried fully ripen fruits of the plant <i>Pedalium murex</i> Family <i>Pedaliaceae</i>  |



| Q. No. | Sub Q. N. | Answer   | Marking Scheme |
|--------|-----------|--|----------------|
| 1.     | 1)        | <p><b>Write any two therapeutic uses of tannins with suitable examples: ( 1mark for any two uses, 1 mark for examples)</b></p> <p><b>Uses: (any two)</b></p> <ol style="list-style-type: none"><li>1) As an Astringent having the capacity to combine with tissue protein and precipitate them.</li><li>2) As mild antiseptics</li><li>3) It is used for relaxed condition of throat, mouth and gums.</li><li>4) In cough and diarrhea.</li></ol> <p><b>Examples of drugs containing tannins are Black catechu and Pale catechu</b></p> <p><b>Answer any <u>THREE</u> of the following: ( 4 marks each)</b></p> <p><b>What are Umbelliferous fruits? Describe morphological characters of umbelliferous fruits with diagram.( Description -1 mark, morphological characters 1 mark for each drug, Diagram – ½ mark each of any TWO drug)</b></p> <p>The drugs which belong to family Umbelliferae are called as umbelliferous fruits.</p> <p><b><u>Example any TWO of the following:</u></b></p> <p><b>Coriander Fruit :</b></p> <p><b>Morphological characters –( 1 mark)</b></p> <ol style="list-style-type: none"><li>i) <b>Size</b> - 2 to 4 mm in diameter and 4 to 8 mm in length</li><li>ii) <b>Shape</b> – subglobular</li><li>iii) <b>Colour</b> - yellowish brown to brown</li></ol> | 12M            |
| 2      | a)        |  |                |

**MODEL ANSWER****SUMMER- 17 EXAMINATION**

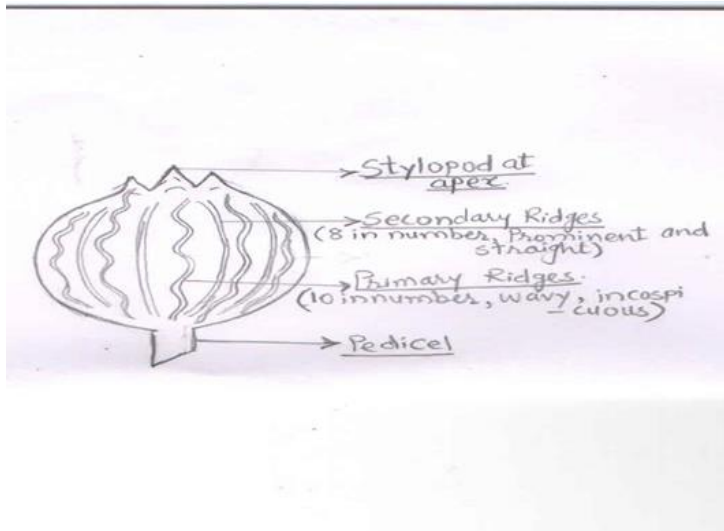
Subject Title: Pharmacognosy

Subject Code: **0807**

iv) **Odour** - aromatic, v) **Taste** - spicy and characteristic

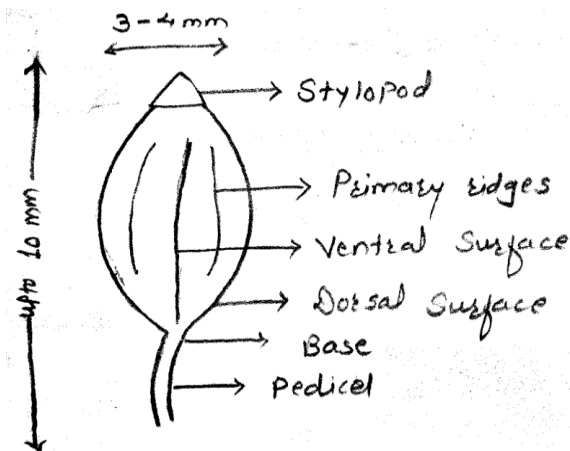
vi) **Extra Features**- Pedicel at base. Primary ridges are straight and faint.

Secondary ridges are wavy and prominent .A pair of stylopods at apex

**Fennel fruit:**Morphological characters:

**Colour**-green to yellowish brown **Odour**: sweet , Aromatic

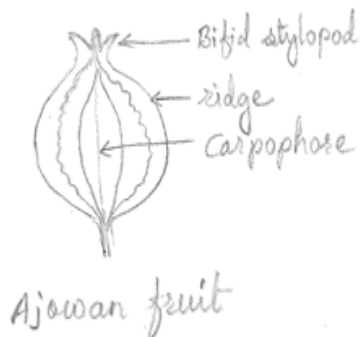
**Taste**: Strongly aromatic and mucilaginous. **Shape**- Straight or slightly curved.

**Ajowan Fruit :**

**Colour**- Yellowish brown **Odour**- agreeable **Taste** – Aromatic, warm like Thymol



**Shape:** It occurs in the form of cremocarps or saperated mericarps with bifid stylopod and five light coloured ridges



**Define Enzymes. Write biological source, chemical constituents and uses of Papaya.**

2.

b)

( Definition -1 mark, Biological source-1mark , Chemical constituents-1mark and uses – 1mark)

**Enzymes-** Enzymes are the protein substances which act as catalysts in various biochemical reactions

**Papaya:**

**Biological source:** It consist of dried latex obtained by giving incision on unripen fruit of Carica papaya Family: Caricaceae

**Chemical constituents:**

Papaya latex contain proteolytic enzymes i.e. Papain & chymopapain, which acts on polypeptides & amides.

Several proteolytic enzymes such as peptidase-I, rennin like milk coagulating enzyme, amylolytic enzyme are also present

**USES ( any two ): 1.** Papain is proteolytic enzyme that tenderises meat & act as clarifying agent in much food industry.

2. It is a common ingredient of brewery industry.



**MODEL ANSWER**

**SUMMER- 17 EXAMINATION**

Subject Title: Pharmacognosy

Subject Code: **0807**

2.

c)

3. These are used to clean up dead tissue from some chronic wounds.
4. It is an ingredient in some toothpastes or mints as teeth – whitener
5. It is used for degumming of silk fabrics in textile industry and in leather industry for dehairing of skins and hides.
- 6.Used in cheese manufacture ,as a substitute of rennin.

**How will you distinguish silk fibre from wool fibres? ( any 4 points – 1mark each)**

| Silk fibre   | Wool fibre  |
|--|---|
| 1.It is obtain from cocoons of silk worms<br>Bombyx mori Family: Bombycidae  | 1.wool fibers are obtained from the fleece of sheep Ovis aries Family: Bovidae  |
| 2.Silk contain a protein known as fibroin.   | 2.Wool contain protein known as keratin.  |
| 3.Fibroin is made up of amino acids, glycine & alanine.  | 3.Keratin is rich in sulphur containing amino-acid- cystine.  |
| 4.When warm with 5% KOH Silk fibres are insoluble  | 4.When warm with 5% KOH Wool fibres are soluble   |
| 5.With Conc Hcl silk fibre are Soluble   | 5.Wool fibres are Insoluble with conc Hcl   |
| 6.Dissolve fibres in warm 20% NaOH, and add a few drops 10% lead acetate solution silk fibres gives no black precipitate | 6.Dissolve fibres in warm 20% NaOH, and add a few drops 10% lead acetate solution wool fibres gives black precipitate |
| 7.Special types of sutures, sieves & ligatures are prepared from the silk.   | 7.Used as filtering & straining medium.<br>In manufacturing of crape bandages.  |

2.

d)

**Describe chemical method of classification of crude drug with its merits and demerits.**

**( 2 marks for description with any 2 examples,1 mark each for merits and demerits.)**

This type of classification is applicable to crude drugs containing similar type of chemicals.





It is useful for phytochemical studies of crude drugs.

1. Volatile oil - Clove, Eucalyptus, Peppermint
2. Alkaloids - Vinca, Nux vomica, Aconite, Vinca etc.
3. Glycoside - Digitalis, Senna, aloe, liquorice
4. Tannins - Catechu, Myrobalan, Kino
5. Resin and resin combination - Tolu balsam, Benzoin, asafoetida, Myrrh, Guggul
6. Carbohydrates and derived products - Agar, Honey, Starch, Tragacanth, Acacia

**Merits**

1. Chemical nature of the drug is known easily.
2. It gives idea about medicinal uses of drugs. As medicinal activity is directly related to chemical nature of drug.

**Demerits**

If the drug contains more than one chemical constituent, it is difficult to classify.

e.g. clove contains both volatile oil and tannins, cinchona contains both alkaloids and Glycosides, Nutmeg contains fixed oil and volatile oil.

**i) Mention the adulterants of Honey and explain the chemical test for detection of adulterants ( 1 mark for the name , 1 mark for chemical test)**

**Invert sugar** is the adulterant of Honey.

**Chemical test:** Stir 10ml of honey with 5ml of solvent ether, allow it separate and draw off 2ml of ethereal layer into a small petridish. Allow ethereal layer to evaporate, to the residue add 1 drop of resorsinol in HCl. It gives cherry red colour.

**ii) Enlist the four species of Cinchona ( ½ mark for each species)**

Cinchona calisaya, Cinchona ledgeriana, Cinchona officinalis, Cinchona succirubra

**MODEL ANSWER****SUMMER- 17 EXAMINATION**

Subject Title: Pharmacognosy

Subject Code: **0807**

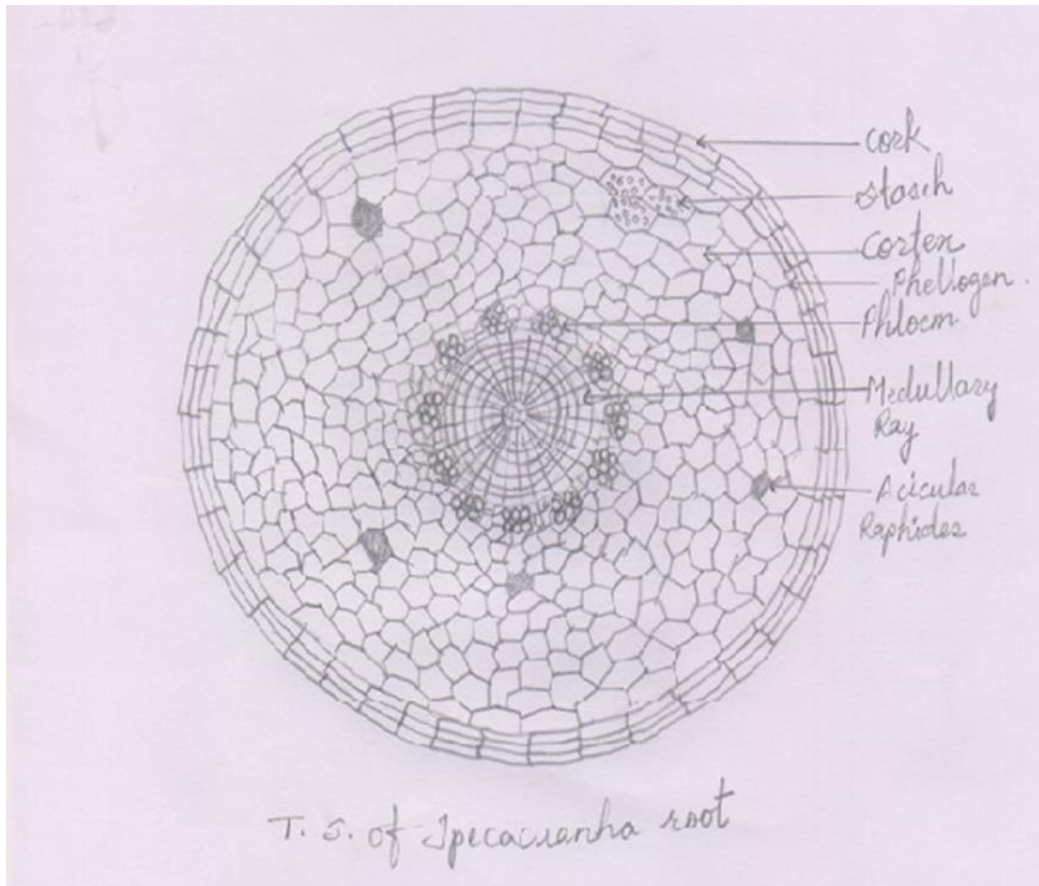
|    |    |  |     |
|----|----|--|-----|
| 3. |    | <b>Attempt any <u>THREE</u> of the following: ( 4 marks each)</b>  | 12M |
| a) |    | <b>Describe method of preparation of silk fibre. Give biological source of silk.(3 marks for method of preparation, 1 mark for biological source)</b><br><br>The larvae of the silkworm produce silk fibroin fibres from the glands in their mouth.<br><br>These fibroin fibres get united with a gum-like secretion known as sericin & forms cocoon.<br><br>Cocoons are heated to 60-80°C by exposing them to steam.<br><br>The exposed cocoons are boiled with water, to dissolve the gum & to separate the fibres<br><br><b>Biological Source:</b> These are the fibres obtained from cocoons of silk worms Bombyx mori<br><br>Family: Bombycidae           |     |
| 3. | b) | <b>(i) Give the biological source and uses of drug which contain 'Bassorin' as a chemical constituents.( 1 mark for biological source, 1 mark for any two uses)</b><br><br><b>Tragacanth</b><br><br><b>Biological Source:</b> Tragacanth is a dried gummy exudate obtained by incision on stem of Astragalus gummifer ,Family: Leguminosae<br><br><b>Uses:</b> Demulcent & emollient in cosmetics<br><br>Use as stabilizer, thickening, suspending & emulsifying agent in pharmaceutical preparations<br><br>Used as an adhesive & in textile industry.<br><br>Mucilage of tragacanth is used as a binding agent in the tablets & also excipient in the pills. |     |
| 3. | b) | <b>(ii) What are natural pesticides: Give two examples.( 1 mark each for meaning and two examples)</b><br><br>These are the pesticides which are obtained from natural sources.<br><br>Eg. Tobacco and Pyrethrum   |     |



3.

c)

Draw a well labeled diagram of T. S. of Ipecac and describe it. (2mark for diagram, 1mark for labelling, 1mark for any 2points of description)



(The complete diagram or part of the above diagram from outermost layer to innermost layer can be considered)

**Microscopy: (any two points)**

1) **Cork:** Narrow tangentially elongated isodiametric cells, with dark brown granular matter.

2) **Phelloderm:** Two or three rows of tangentially elongated thin walled cells. Few cells contain starch grains.

3) **Cortex:** Many layers of thin walled cellulosic parenchyma, with very small intercellular spaces. Scattered idioblasts contain bundles of acicular raphides of calcium oxalate.

4) **Phloem:** Many patches of small groups of sieve tissues embedded in parenchymatous cells,



Subject Title: Pharmacognosy

Subject Code: 0807

above the cambium.

**5) Xylem:** Entirely lignified, consists of xylem parenchyma and medullary rays. Xylem parenchymatous cells are packed with starch grains like those of cortex.

**6) Medullary rays:** Consists of lignified, radially elongated cells arranged in radial rows. Cells are usually filled with starch grains.

3.

d)

**Define Laxatives. Write the biological source, chemical constituents of leaf which has laxative action. (1 mark for definition, 1 ½ mark each for biological source and chemical constituents)**

**Laxatives:** Are the drugs which loose the bowels

**OR**

The drugs producing, increasing and hastening intestinal evacuation

**OR**

The drugs which promote defecation.

**Senna leaf**

**Biological Source:** It consists of dried leaflets & ripe fruits of *Cassia acutifolia*

(Alexandrian senna), *C. Angustifolia* (Tinnevely senna)

**Family:** Leguminosae

**Chemical constituents:** Anthraquinone glycosides: sennoside A, sennoside B, sennoside C, sennoside D, emodin, chrysophanol, aloe emodin, rhein.

Other compounds: Palmidin A, dianthrone diglycoside, rhein anthrone glycoside, aloe emodin glucoside & aloe- emodin diglucoside.

It also contain kaempferol, its glucoside kaempferin & isorhamnetin, phytosterol, resin, & calcium oxalate.



3. e) Define 'Resin and Resin combinations'. Classify it with suitable examples. (½ mark for each definition, 1½ marks for resin classification, 1½ marks for resin combination classification)

Resins are amorphous mixture of essential oils, oxygenated product of terpenes and carboxylic acid and found as an exudation from the trunk of trees.

**Classification of resin according to the principle constituents**

**1. Acid Resins-** Acid is the main constituent of the resins.

e.g. Abiatic acid (colophony), Commiphoric Acid (Myrrh).

**2.Ester Resins -** Ester is the main constituent of the resins

e.g. Benzyl Benzoate (benzoin), Ethyl cinnamate(storax)

**3. Resin Alcohol -** The contents are the complex alcohols of high molecular weight. they are either in free state or as esters.

e.g. Peruresinotannol (peru balsam), Toluresinotannol(tolubalsam)

**RESIN COMBINATION**

Homogenous combinations of resins with other plant products like volatile oil ,gum etc. are known as. resin combinations.

The different resin combinations are.....

**1.Oleo resin** –(volatile oil + resin)

e.g. Ginger,capsicum etc

**2.Oleo gum resin** –( volatile oil + gum + resin)

e.g. Asafoetida, Myrrh

**3.Glycoresins** (Sugar + resin)

e.g. jalap , ipomoea



Subject Title: Pharmacognosy

Subject Code: 0807

|    |              |  |     |
|----|--------------|--|-----|
| 4. | a)           | <p><b>4.Balsam-</b>(Benzoic acid +cinnamic acid)</p> <p>e.g tolubalsam, peru balsam</p> <p><b>Attempt any <u>THREE</u> of the following: ( 4 marks each)</b></p> <p><b>Write the synonyms, chemical constituents and uses of dried kernels of family Myristicaceae( 1mark for any two synonyms, 1 ½ marks for chemical constituents and 1 ½ marks for uses)</b></p> <p><b>Nutmeg</b></p> <p><b>Synonym:</b> Nux moschata, Myristica, Jaiphal</p> <p><b>Chemical Constituents:</b> Volatile oil(5-15%)- myristicin, elemicin &amp; saffrole</p> <p>Fixed oil- myristic, palmitic, oleic, lauric acid.</p> <p>Fat (30%) called as Nutmeg butter</p> <p>Also contain protein &amp; starch</p> <p><b>Uses:</b></p> <p>1. Aromatic 2. Stimulant 3. Carminative 4.Flavoring agent</p> <p>5. Nutmeg butter used in soap industries 6.Used in rheumatism.</p> <p><b>Explain the significance of following in evaluation of crude drug with suitable examples ( 1 mark each for significance and any 2 examples)</b></p> <p><b><u>Optical rotation:</u></b> The substance which has the ability to rotate the plane of polarised light in pure state or in a solution, is an optically active. The phenomenon is known as optical rotation.</p> <p><b>Significance:</b> Most volatile oils contain optically active components and with the help of optical rotation we come to know that substance is leavorotatory or dextrorotatory.</p> | 12M |
| 4. | b)<br><br>i) |  |     |



**MODEL ANSWER**

**SUMMER- 17 EXAMINATION**

Subject Title: Pharmacognosy

Subject Code: **0807**

4.

b)ii)

|           |                  |
|-----------|------------------|
| Drug      | Optical rotation |
| Clove oil | 0° - 1.5°        |
| Honey     | + 3° - 15°       |

**Moisture content:** The moisture content is determined by heating a drug at 105°C

in an oven to a constant weight.

**Significance:** The moisture content of a drug should be determined and also be controlled to make the solution of definite strength.

The moisture content of a drug should be minimized in order to prevent decomposition of crude drug either due to chemical change or due to microbial contamination.

| Drugs     | Moisture Content (% w/w)<br>(Not More Than) |
|-----------|---|
| Aloes     | 10  |
| Digitalis | 05  |
| Ergot     | 08  |
| Acacia    | 15  |
| Starch    | 15  |

4.

c)

**Describe the method of cultivation and collection of opium for market. ( 2marks each for cultivation and collection)**

**Cultivation of Opium:**

Being narcotic drug, its cultivation, processing and marketing are controlled by narcotic Commissioner of India. Cultivation is done by sowing seeds by broadcasting method. About 3 to 4 kg of seeds per hectare are required. They are mixed with sand and are sown. Distance of 25cm between two plants is maintained. Maximum height of plant is 1m.

**Collection of opium:**

Collection starts late in February and may extend upto May. Unripen capsules which changes colour green to yellowish in winter are incised in afternoon vertically from top to bottom of capsules. Whitish latex come out in the next morning, is scrapped off with knife & transferred to earthen vessel. Each capsule is required to be lanced 3 to 4 times on alternate days till no more latex is left. When sufficient latex is collected, it is kneaded into balls that are wrapped in poppy leaves and dried in the shade.

**4. d) Define Glycosides. Describe the method for extraction of glycosides.(1 mark for definition, 3 marks for method for extraction)**

Glycosides: are organic compounds of plant and animal origin which yield on either acidic or enzymatic hydrolysis, one or more sugars and a non sugar residue, called genin or aglycone.

**Method for extraction of glycosides:** The finely powdered plant part is extracted with water or alcohol in soxhlet apparatus. The enzymes present in the plant tissue are destroyed by heating at suitable temperature. Thermolabile glycosides should be extracted at low temperature. The non glycosidal impurities are precipitated with lead acetate solution and excess of latter is removed by passing of hydrogen sulphide gas through the extract. The crude glycosides are purified by using suitable solvent and chromatography, according to the chemical nature and properties of glycosides.

**4. e) i) What is Garbling?(2 marks)**

Garbling is the process applied to remove sand, dirt and foreign organic parts of the same plant, not constituting drug.

**ii) Write about contribution of Seydler. (2 marks)**

Seydler was a German scientist, who coined the term Pharmacognosy in 1815 in his work entitled 'Analecta Pharmacognostica'



**MODEL ANSWER****SUMMER- 17 EXAMINATION**

Subject Title: Pharmacognosy

Subject Code: **0807**

|    |  |     |
|----|--|-----|
| 5. | <p><b>Attempt any <u>THREE</u> of the following : ( 4 marks each)</b></p> <p><b>a) Give chemical constituents and uses of following (Any two)</b></p> <p><b>(Chemical Constituents- 1 Mark and any Two Uses ½ mark each)</b></p> <p><b>i) Vinca</b></p> <p><b>Chemical Constituents:</b></p> <p>The indole-indoline alkaloids are vincristine and vinblastine. The other alkaloids present in the drug are ajmalicine, serpentine, lochnerine and tetrahydroalstonine. It also contains vindoline, vindolinine and catharanthine.</p> <p><b>Uses:</b> 1. Used in the treatment of leukaemia.</p> <p>2. Vinblastine is used in the treatment of generalised Hodgkins disease and chorionepithelioma( coriocarcinoma)</p> <p>3. Vinca also exhibits hypotensive and antidiabetic activity.</p> <p><b>ii) Tolu balsam</b></p> <p><b>Chemical Constituents:</b></p> <p>Balsam of Tolu contains 12-15% of free cinnamic acid, about 8% of free benzoic acid, 7.5% oily liquid (Cinnamein) containing Benzyl benzoate and Benzyl cinnamate. The resinous matter chiefly ester of toluresinotannol. Small quantities of vanillin and styrol are also present.</p> <p><b>Uses:</b> 1. It is used as expectorant</p> <p>2. Flavouring agent</p> <p>3. Antiseptic</p> <p>4. Used in the preparation of confectionary, chewing gums and perfumery</p> | 12M |
|----|--|-----|



5.

a)

iii) **Chaulmoogra oil**

**Chemical Constituents:**

It contains esters of unsaturated fatty acids viz. chaulmoogric acid (27%) and Hydnocarpic acid (48%) and glycerides of palmitic acid.

**Uses:** 1.It is found useful in the treatment of Tuberculosis, Leprosy, Psoriasis

2. In Rheumatism.

iv) **Neem**

**Chemical Constituents:**

It contains Azadirachtin, Salannin and Melianrol. It also consist of nimbin, nimbinin, nimbidin, nimboesterol and a bitter principle called margosine.

**Uses:** 1. Antiseptics 2. Insecticides. 3. Antifertility 4. Antiviral and is being screened for efficacy in treatment of AIDS.

5.

b)

**Define and classify pharmaceutical aids with examples. (1 Mark for definition. Any 6 classes with example ½ mark each)**

**Definition:** The substances which are of little or no therapeutic value but are essentially used in manufacture or compounding of pharmaceuticals are known as pharmaceutical aids.

**Classification with examples : (any 6 classes )**

| Sr. No. | Class                             | Examples                            |
|---------|-----------------------------------|-------------------------------------|
| 1       | Acidulent                         | Tamarind, Lemon Juice               |
| 2       | Colours                           | Turmeric, Saffron, Indigo           |
| 3       | Disintegrating Agents             | Starch, CMC                         |
| 4       | Diluents                          | Cinnamon Water,<br>Peppermint Water |
| 5       | Emulsifying and Suspending Agents | Acacia, Agar, Gelatin               |
| 6       | Filter aids                       | Talc, Bentonite                     |



**MODEL ANSWER**

SUMMER- 17 EXAMINATION

Subject Title: Pharmacognosy

Subject Code: 0807

|    |                   |                                     |
|----|-------------------|-------------------------------------|
| 7  | Flavours          | Cardamom, Rose,<br>Nutmeg, Cinnamon |
| 8  | Hardening Agents  | Beeswax, Hard paraffin              |
| 9  | Lubricants        | Talc, Cocoa butter                  |
| 10 | Solvents          | Alcohol, Glycerine                  |
| 11 | Sweetening Agents | Honey, Saccharine,<br>Glycyrrhiza   |

5.

c)

**Define cardiotonics. Give the biological source and chemical constituents of any one drug. (1 mark for definition, 1 ½ marks for Biological Source and 1 ½ marks Chemical Constituents)**

**Definition:** These are the drugs which gives strength or energy to the activity of the heart.

**OR**

Cardiotonics are the drugs which gives strength or energy to the cardiac muscles.

**Digitalis:**

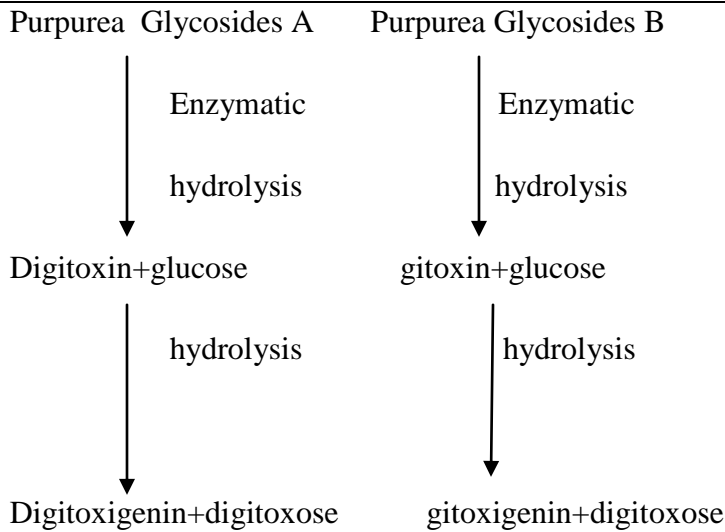
**Biological source:** Digitalis consists of dried leaves of *Digitalis purpurea* family Scrophulariaceae.

**Chemical constituents:** Digitalis contains cardiac glycosides, purpurea glycoside A and B. Digitalis also contains other glycoside such as Odoroside H, Glucogitaloxin, gitaloxin, verodoxin and glucoverodoxin.

**MODEL ANSWER****SUMMER- 17 EXAMINATION**

Subject Title: Pharmacognosy

Subject Code: 0807



Additionally it also contains 2 saponin G. viz Digitonin and gitonin. and also contain hydrolytic enzymes.

**Uses:**

It increases excitability of cardiac muscles and produces more powerful contractions. It is effective in congestive cardiac failure. It is used as cardio tonic drug.

**OR****Arjuna:**

**Biological Source:** It consists of dried stem barks of the plant *Terminalia arjuna* Family: Combretaceae.

**Chemical constituents:** Arjuna contains about 15% of tannins. It also contains triterpenoids saponins, arjunolic acid, arjunic acid, arjunogenin. It also contains  $\beta$ -sitosterol, ellagic acid and arjunic acid.

**Uses:** It is used as cardiotonic. It is also styptic, febrifugal and antidysentric. It possesses diuretic and tonic properties.

**MODEL ANSWER****SUMMER- 17 EXAMINATION**

Subject Title: Pharmacognosy

Subject Code: 0807

5. d) Write the adulterants and substitute for: (Any 1 Adulterant and Substitute- 1 mark each.)

i) **Acacia:**

**Adulterants:** 1. Indian gum is adulterated with **gum ghatti**, obtained from *Anogeissus latifolia*, family Combretaceae.

2. Other adulterants for acacia are starch, tragacanth, dextrin and sterculia gum.

**Substitutes:** Gum obtained from *Acacia senegal*, family leguminosae,

ii) **Nux-vomica:**

**Adulterants:** 1. Dried seeds of *Strychnos nuxblanda*.

2. Dried seeds of *Strychnos potatorum*.

**Substitutes:** 1. The seeds of *Strychnos wallichiana*.

2. The seeds of *Strychnos ignatii*.

5. e) How is quantitative microscopical evaluation done? Explain it. (1 mark for name of method and 3 marks for Explanation)

The quantitative microscopic evaluation is done by **Lycopodium spore method**.

It is an important analytical technique for powdered drugs. Lycopodium spores are very characteristics in shape and appearance and exceptionally uniform in size (25µm). On an average 94,000 spores per mg of powdered lycopodium are present. This method can be used for evaluation of powdered clove, ginger, cardamom, etc.

The percentage purity of an authentic powdered ginger is calculated using following equation:

$$\text{Percentage Purity} = \frac{N \times W \times 94000 \times 100}{S \times M \times P}$$

Where, N = number of characteristics structures (e.g. starch grains) in 25 fields

**12M**



Subject Title: Pharmacognosy

Subject Code: 0807

W= weight in mg of lycopodium taken

S= Number of lycopodium spores in the same 25 fields

M= weight in mg of sample

P= 2,86,000 in case of ginger starch grains powder.

6. **Explain chemical tests for following crude drug (any Four) ( 3 marks each)**

12M

(Any 2 Chemical tests, each test for 1 ½ marks)

6. a) **Black catechu: (Any 2 Chemical tests, each test for 1 ½ marks)**

1. With ferric chloride solution it gives bluish black colour.

2. Black catechu gives pink or red colour with vanillin hydrochloric acid solution.

3. Lime water gives brown color with aqueous solution of black catechu.

4. **Matchstick test:** dip the wooden matchstick in the solution of drug and dry it over a flame. Moisten the stick with hydrochloric acid and warm. Purple colour appears on the matchstick.

**Myrrh: (Any 2 Chemical tests, each test for 1 ½ marks)**

6. b) 1. When triturated with water it forms a yellowish emulsion.

2. Extract small quantity of powdered Myrrh with ether and evaporate the solvent in such a way that a thin film of the resin is left in the dish. Pass the vapors of bromine or fumes of nitric acid over the film. A deep violet colour is produced.

6. c) **Ergot: (Any 2 Chemical tests, each test for 1 ½ marks)**

1. To defatted ergot powder add 50% potassium hydroxide solution and heat at 170<sup>0</sup>C for 1hrs, cool, wash thoroughly with alcohol and to it add first iodine solution and then 20% sulphuric acid, violet colour is produced.

2. Extract about 1gm of powdered ergot with 10ml of solvent ether along with 0.5ml of dilute sulphuric acid. Filter the extract and to the filtrate add about 1ml of cold saturated solution

**MODEL ANSWER****SUMMER- 17 EXAMINATION**

Subject Title: Pharmacognosy

Subject Code: 0807

of sodium bicarbonate. The aqueous layer becomes red or violet (due to Sclererythrin).

3. In UV light, ergot powder shows red fluorescence.

4. Extract ergot with chloroform and sodium carbonate and to extract add paradimethylaminobenzaldehyde, 35% sulphuric acid and 0.5% ferric chloride solution. A blue colour is produced. (Ergotoxin test)

**Kaolin: (Any 2 Chemical tests, each test for 1 ½ marks)**

1. Heat the kaolin on charcoal block with cobalt nitrate. It results in a blue mass due to alumina.

2. Fuse 1gm of Kaolin with 2gm anhydrous sodium carbonate, warm with water and filter. Acidify the filtrate with hydrochloric acid, dilute and warm. Residue of silica is obtained, the solution after neutralization gives reactions characteristic to aluminium.

**Agar: (Any 2 Chemical tests, each test for 1 ½ marks)**

1. Boil about 1.5gm of agar with 100ml of water. Cool the solution to room temperature. It forms a stiff jelly.

2. When mounted in solution of ruthenium red and examine under microscope, the mounted particles acquires pink colour.

3. To 0.2% solution of agar in water, add solution of tannic acid no precipitate is produced.

4. When N/50 iodine solution is added to the powder, it produces crimson to brown colour.

5. Agar is incinerated to ash, dilute hydrochloric acid added and observed under microscope. Skeletons and sponge spicules of diatoms are seen.

6. Hydrolyze the aqueous solution of agar with hydrochloric acid by boiling. To it add Fehling solution A & B in equal quantity & heat again. Red precipitate is observed.

7. Hydrolyze the aqueous solution of agar with hydrochloric acid, to it barium chloride is added. A white precipitate of barium sulphate is formed.

8. To the aqueous solution of agar add Molisch's reagent. A purple colour ring is formed at

**MODEL ANSWER****SUMMER- 17 EXAMINATION**

Subject Title: Pharmacognosy

Subject Code: **0807**

the junction.

**6. f) Shark liver oil: (Any 2 Chemical tests, each test for 1 ½ marks)**

1. Dissolve 1gm of shark liver oil in 1ml of chloroform and treat with 0.5ml of sulphuric acid. It acquires light violet colour, changing to purple and finally to brown (due to Vitamin A).

2. Dissolve 1ml of shark liver oil in 10 ml of chloroform and treat with saturated solution of antimony trichloride in chloroform. Shake it well. A blue colour is developed (due to Vitamin A)