

**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)	<p>Attempt any Eight of the following (2 marks each)</p> <p>Define with example (Any Two) (½ mark for definition, ½ mark for any one example)</p> <p>i) Dried Juices: The juices are obtained from fleshy leaves (aloes) or from stems of the trees. In all cases, incisions are made to respective part of the plant and juices coming out is collected and dried. e.g. Aloes, Kino</p> <p>ii) Latex: The latex is the product contained in special secretory tissues of certain plant. It is usually, a white aqueous suspension, wherein microscopically small particles of oil globules are</p>	16



suspended. e.g. Opium, Papaya

iii) Extracts: The extract is made by boiling the parts of plant with water followed by concentration

OR

Extracts are prepared by using alcoholic or hydroalcoholic solution and adjusting the product to a standard strength.

e.g. Agar, Sodium alginate, Catechu, Gelatin

Differentiate between Leaf and Leaflets (½ mark for each point)

1 b)

Sr. No.	Leaf	Leaflets
1	In case of leaves, bud or branch is present in the axil.	It is absent in leaflets.
2	Leaves are arranged spirally and they are solitary in nature.	Leaflets are arranged in pairs.
3	Leaves lie in different planes.	Leaflets lie in the same plane.
4	Leaves are generally symmetrical at the bases. e.g. digitalis, belladonna, vasaka	Leaves are generally symmetrical at the bases. e.g. digitalis, belladonna, vasaka

1 c)

Which part of the Plant is used as drug? (½ mark for each)

i) **Cannabis:** Dried flowering tops

ii) **Rauwolfia:** Dried roots

iii) **Cardamom:** Dried ripe fruits and seeds

iv) **Ergot:** Dried sclerotium

1 d)

Explain the Role of Galen and Dioscorides in the development of Pharmacognosy. (1 mark each)



Role of Galen: Galen 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 constituents from plants & animals is called as Galenical Pharmacy.

Role of Dioscorides: a Greek physician in 78 AD described several plants of medicinal importance in "De Materia Medica".

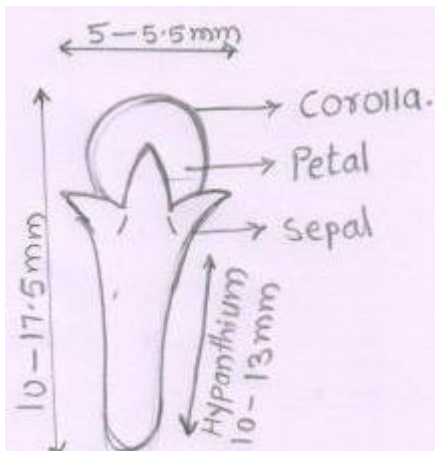
1 e) **Name the drug which contains:**

i) Oleo gum resin: Asafoetida, Guggul, Myrrh (**Any one of these three drugs ½ mark**)

ii) Strychnine, Brucine: Nux vomica (**½ mark**)

iii) Allyl, propyl disulphide, allin, allicin : Garlic, d-linalool: Coriander (**1 mark**)

1 f) **Describe morphological characters of clove with diagram.**(1 mark for diagram and 1 mark for any two characters)



Colour: Crimson to dark brown

Odour: slightly aromatic

Taste: Pungent and aromatic followed by numbness

Size: about 10 to 17.5mm in length, 4mm in width and 2mm thick



Shape: Hypanthium is surmounted with 4 thick acute divergent sepals surrounded by dome shaped corolla.

1 g) **What is the significance of following chemical tests when wool is treated with (1 mark for each test)**

i) **Lead acetate solution:** When lead acetate is added to a solution of wool in caustic soda, a black precipitate is formed. This test indicates wool contains sulphur containing amino acid, Keratin. This test distinguishes wool from silk.

ii) **Millon's reagent:** When wool is warmed with Millon's reagent a red stain is produced. This test indicates that wool contains protein.

1 h) **What are Enzymes, give its example.(1 mark for definition, 1 mark for any one example)**

Enzymes: Enzymes are protein substances, which serve a role of catalyzing the biochemical reactions.

e.g. Diastase, Yeast, Papaya (**Any one example**)

What is the significance of Pharmacopial standards (2 marks)

1 i) **Significance of pharmacopoeial standards:** by the use of various pharmacopoeial standards the purity and quality of crude drugs can be determined. Pharmacopoeial standards are useful for authentication of unknown species of crude drug.

Write Synonyms for each of the following: (½ marks each for any one synonym)

1 j)

i) **Gokhru:** Puncture vine

ii) **Vasaka:** Adhatoda, Adulsa, Vasaka leaves

iii) **Aconite:** Aconite root, Monkhood, Mouse bane, Mitha zahar, Wolfs bane

iv) **Gymnema:** Gudmar, Madhu nashini



1	k)	<p>Which Chemical class is identified by Modified Borntragers's test? How will you perform it? (1 mark for test, 1 mark for chemical class)</p> <p>C-Glycosides are identified by Modified Borntrager's test.</p> <p>Modified Borntrager's test: To 0.1 g of drug add 5% solution of ferric chloride (2ml), and dilute hydrochloride acid (2ml). Heat on boiling water bath for 5mins. Cool and shake gently with benzene. Separate benzene layer and add equal volume of dilute ammonia. A pinkish red colour is produced.</p>	
1	D)	<p>Write official requirements of surgical dressings. (½ mark each for any four points)</p> <p>Surgical dressings should comply with the following official requirements:</p> <ol style="list-style-type: none">1. They should be sterilized before use.2. They should be stored in dry, well ventilated place at a temperature, not exceeding 25⁰C.3. They should be used with permitted antiseptics in prescribed concentration only.4. They should not be dyed unless mentioned in the monograph.5. Adhesive products should not be allowed to freeze.6. There should not be any loose threads, fibre ends in dressings.	
2	a)	<p>Attempt any <u>THREE</u> of the following: (4 marks each)</p> <p>What are volatile oils? State different techniques for isolation of volatile oils.</p> <p>(Definition 1 mark , any three methods of isolation carry 1 mark each.)</p> <p>Volatile oils are odourous and colourless principles of plants and animal sources which get evaporated when exposed to air.</p> <p>Methods of extraction:</p> <p>1) DISTILLATION</p>	12



Most of the oils are obtained by distillation method which are of following 3 types

a. Water distillation -is mostly applicable to such plant material, which is dried initially in air and the constituents are not degraded by boiling up to 100⁰C

e.g. Turpentine oil

b. Water and steam distillation – It is often suitable for such plant materials, whether fresh or dried ,the constituents of which undergo degradation by direct boiling e .g Clove oil

c. Direct steam distillation- It is invariably applicable to fresh drugs which are loaded with sufficient natural moisture and hence no maceration is required e.g. peppermint oil.

2) Solvent Extraction

Extraction is done by using some organic solvents like ether, benzene, petroleum etc.

3) Ecuelle Method

In this method the oil cells of the citrus fruits are ruptured mechanically using pointed projections and thus citrus oil is extracted.

4) Enfleurage Method - it is used in the extraction of delicate perfumes. The fresh flower petals are spread on a fatty material. The spread petals are exhausted after sometime as the fatty material absorbs the oil. These exhausted petals are replaced by fresh petals and then the oil is collected from the fatty material.

2

b)

Describe method of collection and preparation of Rauwolfia for market. (4 marks)

Collection and preparation of Rauwolfia for market:When the plant is about 2 to 4 years old, roots and rhizomes of rauwolfia are dug out in October-November after hot and dry period (after the shedding of leaves as it contains maximum amount of alkaloids). Aerial parts are removed and roots are separated. Roots are then washed properly with water to remove earthy matter and dried in sunlight till moisture is about 10 to 12%. Roots should be protected from light and stored in air tight containers. Drug is collected from wild as well as cultivated plants.



2	c)	<p>What are antirheumatics? Describe biological source and uses of any one antirheumatic drug.[1 mark for definition, 1 ½ marks for Biological Source. , 1 ½ marks for Uses (Any Three)]</p> <p>Antirheumatics: The drugs which are used to relieve or in the treatment of rheumatism are known as antirheumatics.</p> <p>Indian Bdellium (Guggul)</p> <p>Biological source- Guggul is the oleo gum resin obtained by making incisions on the bark of the plant <i>Commiphora weightii</i> , <i>Commiphora mukul</i> belonging to family Burseraceae.</p> <p>Uses: It is used as antirheumatic, anti-inflammatory, hypolipidemic, and hypo cholesteremic drug.</p> <p style="text-align: center;">OR</p> <p>Indian Colchicum</p> <p>Biological source- Colchicum consist of dried seeds and corm of the plant <i>Colchicum luteum</i> belonging to family Lilliaceae.</p> <p>Uses: Colchicum seeds are used in gout and rheumatism. Colchicine is used to cause polyploidy. It is also used in horticulture and in the cultivation of medicinal plants.</p>	
2	d)	<p>Describe the synonym, chemical constituents and uses of any two: (½ mark for any 1 Synonym, 1 mark for Chemical constituents, ½ mark for uses of each drug i.e. 2 marks for each drug)</p> <p>i) Liquorice</p> <p>Synonym: Liquorice root, Glycyrrhiza, Mulethi, Jaistamadh</p> <p>Chemical constituents: The chief constitutents of liquorice is tri terpenoid saponin known as glycyrrhizin (glycyrrhizic acid) other constituents of liquorice are flavone glycoside, liquiritin glucose upto 4%, sucrose 2.5 to 6.5 , bitter principle, resins, aspargin 2 to 4% and fat.</p> <p>Uses: It is used as demulcent and mild expectorant. It is used as sweetening agent, an anti-</p>	



spasmodic, anti-inflammatory and anti-ulcer drug. It is used as flavoring agent and for improving taste of bitter medicine like quinine and cascara. It is also used in cough lozenges, cough pastilles and also as absorbent pill excipients in the form of powder.

ii) Nux Vomica:

Synonym: Crow-fig, Semen strychni, Nux vomica seed, Kuchala, Vishamushti

Chemical Constituents: It contains 1.5 to 5% of bitter indole alkaloids. Chief constituent of Nux Vomica are strychnine, Brucine. While vomicine, α -colubrine, pseudo strychnine and strychnicine are also present. Seed also contain 3% of fat.

Uses: Due to its bitter taste Nux Vomica is used as stomachic and tonic. It stimulates the CNS. It increases the blood pressure and recommended in certain form of cardiac failure. Brucine is also used as a strong dog poison

iii) Papaya:

Synonym: Papaya

Chemical constituents: The different proteolytic enzymes present in papaya latex are the mixtures of papain and chymopapain.

Uses: It is used in clarification of beverages, add as a meat tenderizer. Medicinally it is used as digestant and anti-inflammatory agent. It has shown relieving symptoms of episiotomy.

iv) Tobacco:

Synonym: Leaves tobacco

Chemical constituents: It contains pyridine- piperidine type of alkaloids among which the most important is nicotine, which is about 0.5%. The other alkaloids are nornicotine and anabasine.

Uses: Nicotine gives stimulant effect on heart and nervous system. Nicotine is used in manufacture of nicotinic acid and nicotinamide. Tobacco and nicotine are used as insecticide as it controls wide range of insects.



2	e)	<p>Explain the chemical test for identification of crude drug containing- (2 marks each)</p> <p>i) Cardiac glycoside: Killer Killani Test :</p> <p>The test consists of boiling about 1gm finely powdered digitalis with 10 ml of 70% alcohol for 3mins. The Extract is filtered. To the filtrate 5ml of water and 0.5ml of strong lead acetate solution is added, again filtered. Filtrate is treated with equal volume of chloroform and evaporated to yield extract. The extract is dissolved in glacial acetic acid ,cooled and then added 2drops of ferric chloride solution. These contents are transferred to a test tube containing 2ml of concentrated sulphuric acid. A reddish brown layer acquiring bluish green colour after standing is observed due to presence of digitoxose.</p> <p>ii) Tropane Alkaloids: Vitali Morin Reaction</p> <p>The tropane alkaloids is treated with fuming nitric acid, followed by evaporation to dryness and addition of methanolic potassium hydroxide solution to an acetone solution of nitrated residue. Violet coloration takes place due to tropane derivatives.</p>	
3	a)	<p>Attempt any THREE of the following: (4 marks each)</p> <p>What are resins? Give the classification of resins .(1 mark for definition and 1 mark for each class with example)</p> <p>Resins are amorphous mixture of essential oils, oxygenated product of terpenes and carboxylic acid and found as an exudation from the trunk of trees.</p> <p>Classification of resin:</p> <p><u>1.Acid Resins</u>- Acid is the main constituent of the resins. e.g. Abiatic acid (colophony), Commiphoric Acid (Myrrh).</p> <p><u>2.Ester Resins</u> - Ester is the main constituent of the resins e.g.Benzyl Benzoate (benzoin), Ethyl cinnamate (storax)</p> <p><u>3.Resin Alcohol</u> - The contents are the complex alcohols of high molecular</p>	12



weight. they are either in free state or as esters.

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

3 b) **Explain pharmacological method of classification of crude drug with its merits and demerits. (Explanation of method 2 marks and 1 mark each for merits and demerits)**

In Pharmacological classification, drugs are classified according to the pharmacological action of their active ingredients. Thus the drugs similar in their action are put together, regardless of the morphology, biological behaviour.

e.g. Carminative - fennel, coriander

Laxative - castor oil and aloe

Antihypertensive - rauwolfia

Anti-tumor - Vinca

Anti-tussive - Tulsi

Merits: (1 mark for any 2 of the following merits)

1. Even if chemical constituents are not known, the drugs are classified according to the pharmacological action of the drugs.
2. Therapeutic uses are properly understood
3. Combination of drug can be used to improve its action.

Demerits: (1 mark for any 2 of the following demerits)

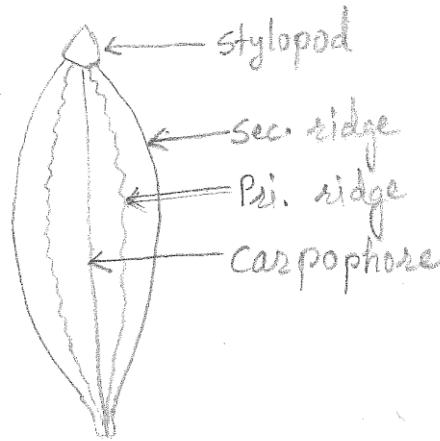
1. Chemical constituent and morphology of the drug is not known.
2. If the drug has more than 1 pharmacological action it is difficult to classify them.
E.g. Opium has analgesic and anti diarrhoeal action.
3. Crude drug used as a pharmaceutical aid, do not find any place.



3 c) Give two examples of crude drugs from each of the following family: (1 mark for any 2 examples of each family)

- i) **Labiatae**- Mentha, Tulsi
- ii) **Solanaceae**- Ashwagandha, Belladonna, Datura, Hyoscymus
- iii) **Burseraceae** – Guggule, Myrrh
- iv) **Apocynaceae** – Rauwolfia, Vinca

3 d) Explain with diagram, morphological characters of fruit drug belonging to family umbelliferae(2 marks for diagram and 2 marks for morphological characters for any 1 fruit i.e. Fennel or Ajowan or Coriander)



Fennel fruit.

Morphological characters of Fennel fruit:

Colour-green to yellowish- brown

Odour-Sweet aromatic

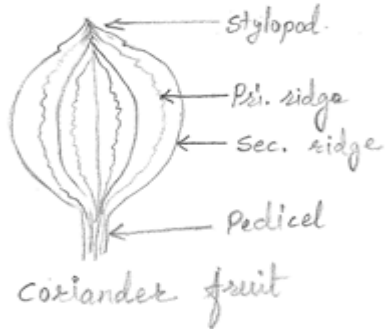
Taste- Strongly aromatic



Size-5 to 10x2 to 4mm

Shape- straight or slightly curved

OR



Morphological characters of Coriander fruit:

Colour- yellowish- brown to brown

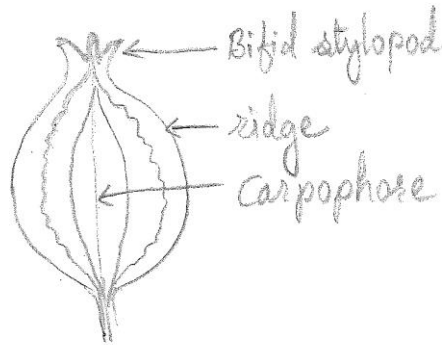
Odour- aromatic

Taste- Spicy and characteristic

Size- 2 to 4mm in diameter and 4-8mm in length

Shape- Sub- globular cremocarpous fruit with about 10 pri. Ridges and 8 sec. ridges

OR



Ajowan fruit

Morphological characters of Ajowan fruit:

Colour- Yellowish- brown

Odour- Agreeable

Taste- Aromatic, Warm like thymol

Size- 1.7 to 3mm long and 1.5 to 2.4mm in broad and 0.5 to 1.5mm thick.

Shape- Cremocarpous fruit with bifid stylopod, and 5 light coloured ridges.

Differentiate between Acacia and Tragacanth(4 marks for any 4 points of Differentiation)

3

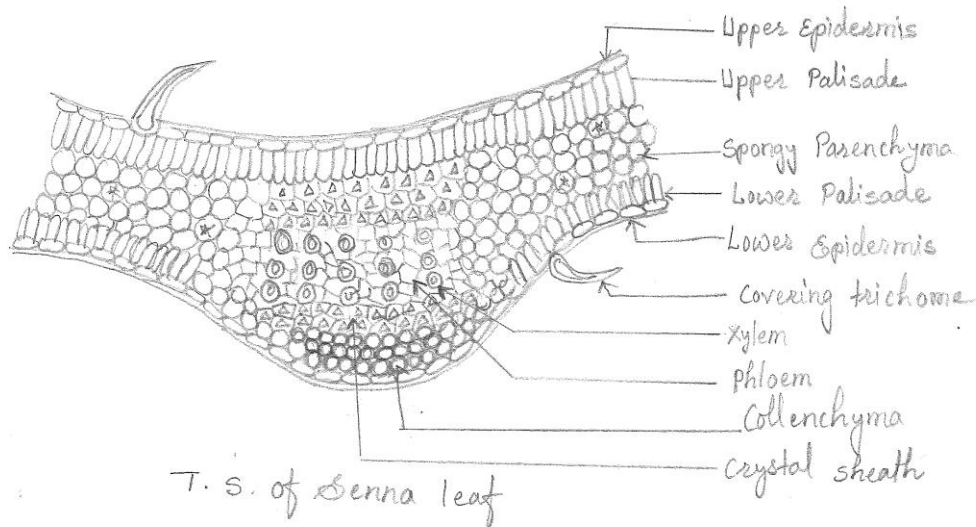
e)

Sr.No.	Acacia	Tragacanth
1	Colour is cream brown to red	Colour is white or pale yellowish white.
2	Taste is bland and mucilaginous.	It is tasteless
3	Solution of lead sub acetate gelatinizes aq. Solution of acacia.	It gives negative test with lead sub acetate.
4	It does not give the test with NaOH	When warm with NaOH solution, it gives

	solution.	canary yellow colour
5	It does not give test with iodine solution	With iodine solution it gives green colour.

Attempt any **THREE** of the following:(4 marks each)

- 4 a) Draw a well labelled diagram of T.S. of senna describe the same.(2 marks for diagram and 2 marks for description)



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Microscopy:

Lamina-Isobilateral nature

Upper Epidermis: Single layered, polygonal, straight walls, few cells contain mucilage, epidermis is covered with cuticle.

Upper palisade: Single layered, elongated, compactly arranged , narrow, thin walled parenchyma continued over midrib region.

Spongy parenchyma: Thin walled , loosely arranged, spheraphide presents.

Lower Palisade: Only in lamina, loosely arranged wavy walls, cells smaller than upper palisade.



Midrib contains:

Crystal Sheath: Parenchymatous layer containing calcium oxalate prism, present at dorsal and ventral side.

Sclerenchymatous sheath: Lignified, thick walled cells, covering the vascular bundle.

Xylem: Lignified cells, present at ventral surface.

Phloem: Non- lignified cells present at dorsal surface.

Collenchyma: Multilayered, thick walled parenchyma containing cellulose present only at ventral side.

Trichomes: Conical unicellular, thick walled, covering trichome.

Stomata: Paracytic type (Rubiaceous).

Describe the method of preparation of absorbent cotton(4 marks)

4

b)

Fruits (capsules) are 3-5 celled, which contain numerous seeds..

Seeds covered with hair, known as Balls. Balls are collected, dried & taken to ginning press, where in trichomes are separated from seeds. Raw cotton obtain from above is subjected to a process called combing. This saperates the long and short fibres .The long fibres are spun and woven as cloth and short fibres are called linters. This is used for manufacturing of absorbent cotton.

Remove impurities (vegetable debries) from raw cotton

To remove wax, fatty material & colouring matter, raw cotton is taken to the machine, cotton opener & followed by treatment with dil. Soda solution or soda ash solution under pressure for about 10-15 hrs. Washed with water & treated with suitable bleaching agent. Again washed, dried & make a flat sheet .Finally packed in paper wrappers & sterilized.



4

c)

Write about 'Ayurveda' as traditional system of medicines (4 marks)

It is the oldest system of medicine in India. In Ayurveda there is a supposition that everything in universe is made up of 5 basic elements (Panchamahabhuta) like solid, liquid, air, space, and energy. These 5 elements exist in the body in combined form like Vata, Pitta, Kapha. These three forms are together called as "Tri-dosh".

1. Vata(space+air)

2. Pitta(energy +liquid)

3. Kapha(solid+liquid)

The seven forms of Tri dosh are called as 'SAPTADHATU'. These saptadhatu undergo wear and tear processes and form excretory material or mala.

When these tri dosh, saptadhatu and mala are in balanced form, the condition is healthy. But if it is in imbalanced form there are pathological disorders. In Ayurveda Charak Samhita and Sushrut Samhita are two well-known treatises. In Charak Samhita descriptions of plants used as medicine are included and in Sushrut Samhita emphasis is given on surgery.

4

d)

Write biological source and uses of :**(1/2 mark – biological source, 1/2 mark for any 1 use)**

i) **Starch:** Starch of pharmaceutical use consists of the grain separated from tubers of potato, *Solanum tuberosum*, Family: Solanaceae, **Or** from the mature grains of maize, *Zea mays* **Or** from the mature grains of wheat *triticum aestivum* **Or** grains of rice, *Oryza sativa* belonging to family Graminae.

Uses:

1. Nutritive, Demulcent, protective

2. Preparation of dusting talcum powder.

3. As an antidote in Iodine Poisoning.

4. As a Disintegrating agent and diluents.



5 .Diagnostic aid in identification of crude drugs.

6. Starting materials for the manufacture of dextrose and glucose.

ii) Rhubarb: It consists of peeled and dried rhizomes and roots of *Rheum officinale*, family Polygonaceae.

Uses:

In large doses is used as purgative. In very small doses the drug is given to the children in diarrhoea. It also shows astringent effect after purgation due to the presence of tannins in it.

iii) Neem : It consist of leaves and aerial parts of *Azadirachta indica*, belonging to family Meliaceae.

Uses : Neem leaves & Neem oil used as antiseptics & insecticides & in skin diseases.

Also used as antifertility, antifungal & antimicrobial against gram+ve & gram-ve bacteria.

Also used in the treatment of AIDS.

iv) Wool:

Wool is obtained from the protective covering or fleece of the sheep, *Ovis aries*.

Family: Bovidae,

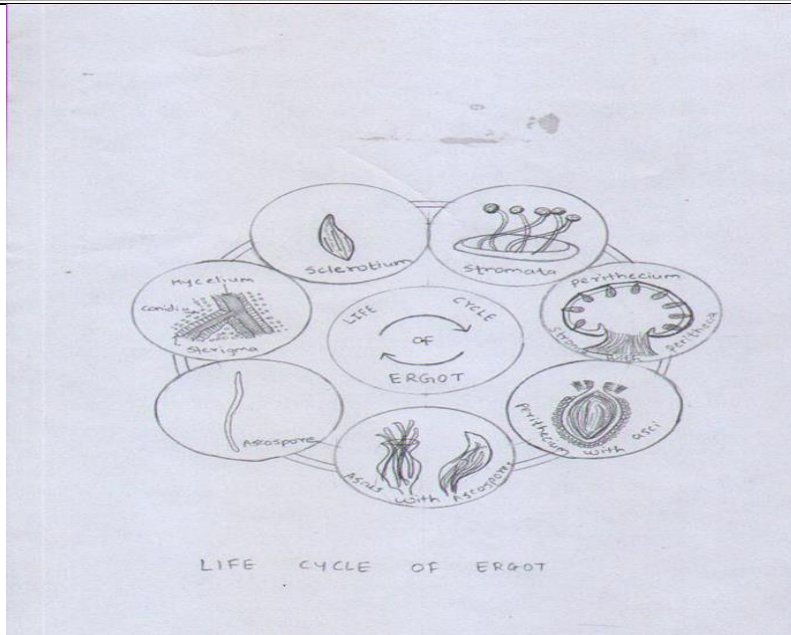
Uses: Wool is used as a medium for filtration and straining. It is also used for the manufacturing of crepe bandages and dressings.

Define Oxytocics. Explain life cycle of Ergot. (1 mark each for definition and diagram, 2 marks for explanation)

Oxytocics are the agents which causes expulsion of the contents of uterus by contracting the uterine smooth muscles.

4

e)



Ergot is a fungal growth. The life cycle of ergot contains three stages:

1) Ascospore stage 2) Asexual stage/Honey dew stage

3) Sexual stage

Ascospore stage: The sclerotia produced in late summer and fall on the ground. In damp condition these sclerotia germinate to produce small purple colour stalks(stroma), which on further growth form a flattened spherical head at the top. These head contain several flask shape cavities which are known as perithecia

Asexual stage: Each perithecium contains several elongated asci. Each ascus contains eight elongated thread like ascospores. These ascospores dispersed by air current. The dispersed ascospores entangled with the feathery stigmas of host and produce mycelia which penetrate the ovary. The mycelia give rise to conidia, produce from the surface of the ovary. The honey dew is sweet in taste and attract the insects. Along with honey dew, conidia are carried from one place to another by insects.

Sexual stage: Hyphae penetrate deeply into the ovary and develop into a mass covering the entire ovary which results in the formation of elongated sclerotium. Sclerotium develops further and fall on the ground, and next cycle begins.



5

- a) **Attempt any THREE of the following:**
Define adulteration and substitution. Describe why moisture content is useful in evaluation of crude drug. (1 mark for each definition)

Adulteration: Adulteration is the debasement of an article. **OR**

Adulteration is substituting the original crude drug partially /completely with other similar type of drug.

Substitution: It involves total replacement of original drug with totally different substance, contains same type of active chemical constituents but at a lesser extent.

Moisture content (2 mark)

Moisture content: The percentage of active chemical constituents in crude drugs is mentioned on air dried basis .Hence the moisture content of a drug should be determined and should be controlled. The moisture content of a drug should be minimized in order to prevent decomposition of crude drugs either due to chemical change or microbial contamination.

The moisture content is determined by heating a drug at 105°C in an oven to a constant weight.

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

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- 5 b) Give the classification of Alkaloids with one example of each type and their source (four marks for any 4 of the following types of alkaloids i.e. 1 mark for each type)

TYPES OF ALKALOID	EXAMPLE	SOURCES
Tropane Alkaloid	Atropine, cocaine	Datura , cocca
Quinoline Alkaloid	Quinine , cinchonine	Cinchona
Isoquinoline Alkaloid	Papaverine, emetine	Opium , ipecac
Indole Alkaloid	Reserpine , vincristine	Rauwolfia , vinca
Phenanthrine Alkaloid	Morphine	Opium
Purine Alkaloid	Caffiene	Coffee
Pyrone Alkaloid	Nicotine	Tobacco
Pyridine Alkaloid	Ricinine	Castor seeds
Imidazole Alkaloid	Pilocarpine	Pilocarpus
Steroid Alkaloid	Conessine, Solanine	Kurchi
Terpenoidal Alkaloid	Aconitine	Aconite
Alkaloidal amine	Ephedrine	Ephedra



5 c)

How will you differentiate**i) Organised and Unorganised crude drug.(any 4 points ½ mark each)**

Organized crude drug	Unorganized crude drug
1. It is obtained from definite anatomic parts of the plants such as flowers, leaves, fruits etc	1. It is obtained from plants or animals by means of physical process such as drying, incision, extraction such as juices, resins.
2. It is made up of definite tissue and cell.	2. It does not have cellular structure.
3. It is solid in nature	3. It is solid, semi-solid and liquid in nature.
4. Microscopical characters are used for identification.	4. Chemical tests and physical standards are used for identification.
5. Botanical and zoological terminology can be used to describe the drug	5. Botanical and zoological terminology is inadequate. To describe these drugs, physical characters such as solubility, optical rotation, refractive index are used.
Ex. Coriander, fennel, datura, etc	Ex. Aloe, tragacanth, asafoetida etc

ii) Sumatra benzoin and Siam benzoin .(2 marks for any 2 of a,b,c,d)

Sumatra benzoin	Siam benzoin
a) Greyish-brown to grey in colour Aromatic & characteristic odour It occurs in the form of lumps of varying	Yellowish-Brown to rusty- brown Agreeable & vanilla like odour It occurs as hard & brittle masses.



5	d)	sizes or tears. When heated fumes of benzoic & cinnamic acids are produced	When heated, it is softened & becomes plastic.
		b) In 0.25 gm of benzoin add 5ml of solvent ether and decant 1ml of the ether solution into a porcelain dish and add to it 2 drops of H ₂ SO ₄ . A deep reddish brown colour is produced in case of Sumatra benzoin.	While A deep purplish red colour is produced in case of Siam benzoin.
		c) On heating benzoin in a test tube with 10ml solution of potassium permanganate. Develops a strong odour of benzaldehyde in case of Sumatra benzoin.	No odour of benzaldehyde in case of Siam benzoin.
		d) Heat benzoin in dry Test tube covering with glass slide. Observe the same slide under microscope . Cinnamic acid crystals are observed in case of Sumatra benzoin.	Cinnamic acid crystals are not observed in case of Siam benzoin
	d)	Name the drug which is used as antimalarial. Give its synonym, biological source and chemical constituents.(1 mark each for mentioning name of the drug, synonym, biological source and chemical constituents)	

**Cinchona**

synonym : Jesuit's bark, Peruvian bark

Biological source. - It consists of the dried bark of cultivated trees of Cinchona calisaya, Cinchona ledgeriana, Cinchona officinalis, Cinchona succirubra Family – Rubiaceae

Chemical Constituents-

Alkaloids- quinine, quinidine, cinchonine, cinchonidine

Glycosides- quinovin, cinchofulvic, cinchotannic & quinic acids.

cinchona red, tannins, calcium oxalate & starch.

Define with two examples-(2 marks each ,1 mark for definition and 1 mark for any two examples)

i) Carminatives - Carminatives are the drugs that expel gases from gastrointestinal tract by increasing peristalsis.

e.g. - Fennel, coriander, ginger, clove, Ajowan, Nutmeg , cardamom, Black pepper, asafoetida

ii) Astringents - Astringents are the agents which precipitate proteins and causes contraction of smooth muscles.

e.g. – pale and black catechu, clove, cinnamon, Amla

Explain the chemical tests of any FOUR crude drugs.(4 marks each)

Myrrh: (2 marks for any two chemical test)

i) When triturated with water, it forms yellowish brown emulsion.

ii) Ethereal solution of Myrrh becomes reddish when treated with bromine vapour.

iii)Ethereal solution of Myrrh becomes purplish when moisten with nitric acid.

Shark liver oil. (2 marks for each test)

i). Dissolve 1 gm of Shark liver oil in 1ml of Chloroform and treat with 0.5 ml of H₂SO₄ . It acquires light violet colour changing to purple and finally to brown due to Vit. A



ii). Dissolve the drug in 10 ml of Chloroform and treat with saturated solution of antimony trichloride in chloroform, Shake it well, A blue color is developed due to Vit A

Turmeric (4 marks for any four chemical tests)

- i) Powdered drug with sulphuric acid gives crimson colour.
- ii) Powdered drug with Alkali gives crimson colour.
- iii) Aqueous solution of drug with boric acid produces reddish colour which on addition of alkali changes to greenish blue.
- iv) With acetic anhydride & conc. sulphuric acid, it gives violet colour. This test under UV light red fluorescence is seen.
- v) With iodine solution turmeric gives blue colour, due to presence of starch grains.

Gelatin (4 marks for any four chemical tests)

- i) Aqueous solution of drug gives ppt with solution of trinitrophenol and solution of tannic acid.
- ii) on heating gelatin solution with soda lime, ammonia gas is evolved.
- iii) Aqueous solution of gelatin precipitates mercuric nitrate solution forming white colour, which turns black-red on heating.
- iv) Formaldehyde makes gelatin hard & insoluble after drying.
- v) To aqueous solution of drug, add drop of picric acid or tannic acid solution, ppt is produced.



6 e) **Asafoetida : (1mark for each test)**

i) When triturated with water, it forms yellowish orange emulsion.

ii) On fractured surface of drug add sulphuric acid, red or reddish brown color is observed.

iii) Drug when treated with 50% nitric acid gives green color.

iv) Combined umbeliferone test - Triturate about 0.5 gm of drug with sand and 5 ml hydrochloric acid. To it add little quantity of water, filter. To the filtrate add equal volume of ammonia. A blue fluorescence is produced due to presence of umbeliferone.

6 f) **Black Catechu (4 marks for any four chemical tests)**

i). Black catechu gives pink colour with vanillin and Hcl acid.

ii). With Ferric ammonium sulphate it gives green colour ,which reacts with sodium hydroxide to give purple colour.

iii) Lime water gives brown colour with aq solution of black catechu.

iv) Match stick test:-A tip of the match stick is smeared with the paste of black catechu , after dipping it in concentrated HCl is warmed near flame , purple colour is produced due to the formation of Phloroglucinol.

v) Black catechu with FeCl₃ solution gives Bluish black color.



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WINTER- 16 EXAMINATION

Model Answer

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