



WINTER – 12 EXAMINATION

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1. Answer any EIGHT of the following (Each question carries 2 marks)

(a) Define (Each answer carries 1 mark)

i. Pharmacognosy is defined as the scientific and systematic study of structural, physical, chemical and biological characters of crude drugs along with their history, method of cultivation, collection and preparation for the market.

ii. Crude Drug is defined as plant or animal drug that has undergone no other processes than collection and drying.

(b) Which part of plant is used as a drug (Each answer carries ½ marks)

(i) Punarnava: The whole herb

(ii) Ephedra: Stem

(iii) Nutmeg : Dried kernels of seeds

(iv) Arjuna : Dried stem bark

(c) Name the drug which contains the following constituents : (Each answer carries ½ marks)

(i) Rhein:Rhubarb Rhizomes

(ii) Vit-C:Amla

(iii) Fenchone:Fennel

(iv) Bassorin: Tragacanth

(d) Mention synonyms of the following drugs (Each answer carries ½ marks)

(i) Tulsi: Sacred basil or Holy basil

(ii) Nux Vomica: Crow fig /Kuchala/kuchala/Vishamushti (Any of these synonyms)

(iii) Pyrethrum: Insect flowers

(iv) Cinchona: Jesuit's bark or Peruvian bark

(e) Explain in brief principles of Ayurveda

Basic principle in Ayurveda involves the supposition that everything in the Universe is made up of five basic elements like space, air, energy, liquid and solid. These five elements exist in the body in a combined form to form Tri dosh i.e. Vata (space+liquid), Pitta (Energy+liquid) and Kapha (Solid+liquid). These three further exist in body in seven forms called as Saptadhatu. Saptadhatu undergoes wear and tear process to form excretory



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products called Mala. To be healthy Tridoasha, Saptadhatu and Mala should be in a balanced form .

Any imbalance in these leads to pathological disorders.

(f) Differentiate between Gums and resins. (Each point carries ½ marks)

Gums	Resins
Gums are abnormal products of plants produced when it is injured	Resins are either normal metabolic products of plants or occur as a result of pathological process through injury to plants.
Chemically gums consists of polyuronides combined with calcium,potassium and magnesium.	They are the complex mixtures of resin acids, resin alcohols, resinotannols, resin esters, glucoresins
Insoluble in alcohol but soluble in water or swell in water	Insoluble in water but mostly soluble in alcohol and other organic solvents
Eg. Tragacanth, Acacia (Any one of these)	Eg. Colophony, Benzoin, Asafoetida, Myrrh (Any one of these)

(g) Define Astringents. Give any two examples. (Definition carries 1 mark and 1 mark for two examples)

Astringents: Astringents are the substances which cause contraction of organic tissues and muscular living fibers.

Examples: Black Catechu, Gambier (Pale) Catechu

(h) Explain why Borntrager's Test is modified for Aloes

Borntrager's test is modified for Aloes because Aloes contain Barbaloin which is a C- glycoside which does not get hydrolyzed by heating with dilute acid or alkali but can be decomposed by oxidative hydrolysis using Ferric chloride.

(i) Explain the contribution of Galen:

Galen was a 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. He also described various methods of formulation of plant and animal drugs.

(j) One mark for biological source and 1 mark for any two Uses of Vinca.

Biological Source of Vinca: It consists of dried whole plant of Catharanthus roseus. (Family: Apocynaceae)

Uses:

i) Vincristine is used for the treatment of leukemia



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ii) Vinblastine is used for the treatment of Hodgkin's disease and chorionepithelioma

iii) Antidiabetic

iv) Hypotensive

(k) Name the family of the drugs (Each answer carries ½ marks)

(i) Rauwolfia: Apocynaceae

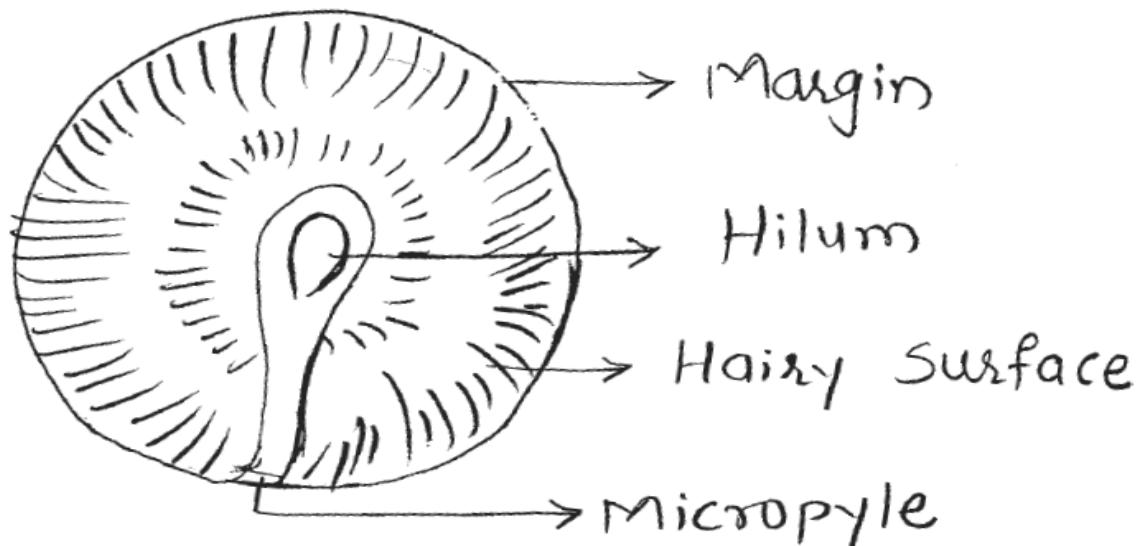
(ii) Clove: Myrtaceae

(iii) Gokhru: Zygophyllaceae

(iv) Guggul: Burseraceae

(l) Draw a well labelled diagram showing external morphological characters of Nux-Vomica.

1 mark for diagram & 1 mark for labels.





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2. Answer any FOUR of the following (Each answer carries 3 marks)

(a) 1 mark for what is pharmacological classification, one mark for advantages and one mark for disadvantages.

Pharmacological classification:

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

e.g Carminative - fennel, coriander

Laxative - Castor oil and Aloe

Antihypertensive –Rauwolfia

Anti-tumor -Vinca

Anti-tussive - Tulsi

Advantages:

Even if the contents of the crude drugs are not known, they can be classified according to the therapeutic or pharmacological action of the drugs.

Disadvantages:

- i. Chemical constituent and morphology of the drug is not known.
- ii. If the drug has more than one pharmacological action, it is difficult to classify it because it may be classified separately at different places. E.g. Opium has analgesic and anti diarrheal action.
- iii. The drug used as a Pharmaceutical aids do not find any place in this class.

(b) Definition carries 1 mark and each example carries 1 mark

Anti-diabetics: Anti-diabetics are the substances used to treat [Diabetes mellitus](#) by lowering [glucose](#) levels in the blood.

Examples:

i) Gymnema

ii) Pterocarpus

(c) Definition of Alkaloids carry one mark and each test for their identification carries 1 mark

Definition: Alkaloids are the basic nitrogenous organic products of plant origin which when administered internally, give marked physiological responses.



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Identification tests: Alkaloids are precipitated by different reagents in following characteristic manner

1. Mayer's Reagent (Potassium mercuric iodide solution) - Cream or pale yellow coloured precipitate.
2. Dragendorff's Reagent (Potassium bismuth iodide solution.) -Brown or reddish brown coloured precipitate.
3. Wagner's Reagent (iodine and potassium iodide soln.) -Brown or reddish brown coloured precipitate.
4. Hager's Reagent (saturated soln. of picric acid)-Yellow precipitate.

(Out of these tests, any two can be written)

(d) External characters of Umbelliferous fruits and two examples(Two marks for any 4 points and 1 mark for two examples)

- i) These are the dry cremocarps which consists of two mericarps.
- ii) Mericarps are separated from each other by a stalk called Carpophore.
- iii) Each mericarp has inner flat Commusural surface and outer Dorsal surface.
- iv) Each pericarp shows stylopod at its apex.
- v) Outer wall of mericarp shows ridges and grooves.
- vi) Each mericarp bears five primary ridges containing fibro vascular bundles in the pericarp.

Examples:Fennel,Coriander,Asafoetida

(e) Official requirement of surgical dressings:(Each requirement carries ½ marks)

1. They should be sterilized before use.
2. They should be stored in a dry and well ventilated place at a temperature not exceeding 25⁰C.
3. They should be used with permitted antiseptic in prescribed concentration.
4. Adhesive products should not be allowed to freeze.
5. There should not be any loose thread, fiber ends in the dressings.
6. They should not be dyed unless mentioned in the monograph.



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(f) One mark for definition and two marks for classification of terpenoids.

Definition: The terpenoids sometimes called isoprenoids, are a large and diverse class of naturally occurring [organic chemicals](#) similar to [terpenes](#), derived from five-carbon [isoprene](#) units (C₅H₈) n

Classification of terpenoids on the basis of isoprene units present (C₅H₈).

Sr.No.		No.of isoprene unit	Molecular formula
1	Hemiterpene	1	C ₅ H ₈
2	Monoterpene	2	C ₁₀ H ₁₆
3	Sesquiterpene	3	C ₁₅ H ₂₄
4	Diterpene	4	C ₂₀ H ₃₂
5	Triterpene	6	C ₃₀ H ₄₈
6	Tetraterpene	8	C ₄₀ H ₆₄
7	Polyterpene	n	(C ₅ H ₈) _n

Q.3 Ans. Any FOUR of the following(3 marks for each answer)

a) Describe organoleptic method of evaluation.

Ans:

- 1) Drug evaluation means confirmation of its identity & determination of its quality & purity.
- 2) organoleptic method of evaluation is carried with the help of sensory organs.
- 3) Evaluation of drugs based on colour, odour, taste, size, shape & special features like touch, texture, sound etc. is called as organoleptic evaluation.

The study of form of a crude drug is Morphology, while description of the form is Morphography.

4) Ex. Sweet taste of liquorice, Aromatic odour of coriander, etc.



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b) Differentiate between Antiseptics & Disinfectants.

½ marks for each point

Sr. No.	Antiseptics	Disinfectants
1	Stops the growth of micro-organisms	Kill microbes & spores.
2	Can be applied on living tissues or on wounds.	Can be applied on non- living surfaces.
3	Use to prevent sepsis	Use to clean non- living surfaces & sterilized glass apparatus, drainage systems.
4	Are not as strong as disinfectants.	Are stronger & more toxic than antiseptics.
5	Are common in items such as mouth wash, eyewash, antiseptic creams.	Are commonly used in household items to protect from germs
6	Ex. Turmeric. Neem,	Ex. Phenyl

c) What are Balsams? Name any two Balsamic drugs.

1 mark for definition & 1 mark for each Example.

Ans. Balsam-Aromatic resinous substances of plant origin containing balsamic acids, which is a combination of benzoic & cinnamic acid are known as balsams.

Ex. Balsam of peru, Balsam of tolu.

d) Give biological source & uses of Digitalis.

1 mark for biological source & 1/2marks for family, generally 3 uses- 0.5mark for each use

Ans. Bio. source: Digitalis consist of dried leaves of Digitalis purpurea, Family- Scrophulariaceae.

Uses:

1. Cardiotonic- Digitalis increases excitability of cardiac muscles & produces more powerful contractions.

2. It is effective in congestive cardiac failure to increase cardiac output & to relieve venous congestion.

3. Use as diuretic.



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e) Give any three general tests for identification of tannins.

Any 3 chemical Tests are expected, accordingly 1mark for each test.

Ans.1. **With FeCl₃:**

Hydrolysable tannins → Bluish colour.

Condensed tannins → Greenish colour.

2. Goldbeater's Skin test (Ox-Intestine):

Soak piece of Goldbeater's skin in 2% HCl, wash with water, soak in test solution, wash with water, finally soak with FeSO₄ gives Brown or Black colour.

3. Gelatin test:

Tannins + 1% Gelatin solution in NaCl gives white precipitate

4. Match stick test

Dip the Match stick in decoction of drug, dry it naturally, moistened with HCl, dry over the flame----
Match stick turns pink/ red colour.

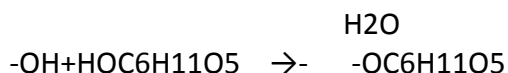
5. Vanillin+HCl reagent → red to pink color.

f) Classify glycosides on the basis of linkage between sugar & non-sugar with one Ex. from each.

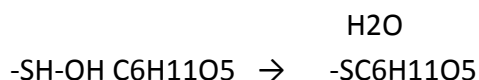
½ marks mark for each glycoside & 0.25 mark for each ex.

Ans.

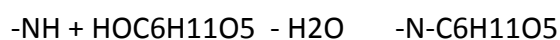
O-glycosides: in these glycosides the sugar part is linked with alcoholic or phenolic hydroxyl or carboxyl group. Ex. Senna



S-glycosides: in these glycosides the sugar attached to a Sulfur atom of aglycone such as in sinigrin .
Ex. Mustard



N-glycosides: in these glycosides the sugar linked with Nitrogen atom of (-NH₂, -NH-) amino group of aglycone. Ex. Adenosine, guanine etc.



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C-glycosides : in these glycosides the sugar linked (condensed) directly to Carbon atom of aglycone like in aloin, cascarioside etc.

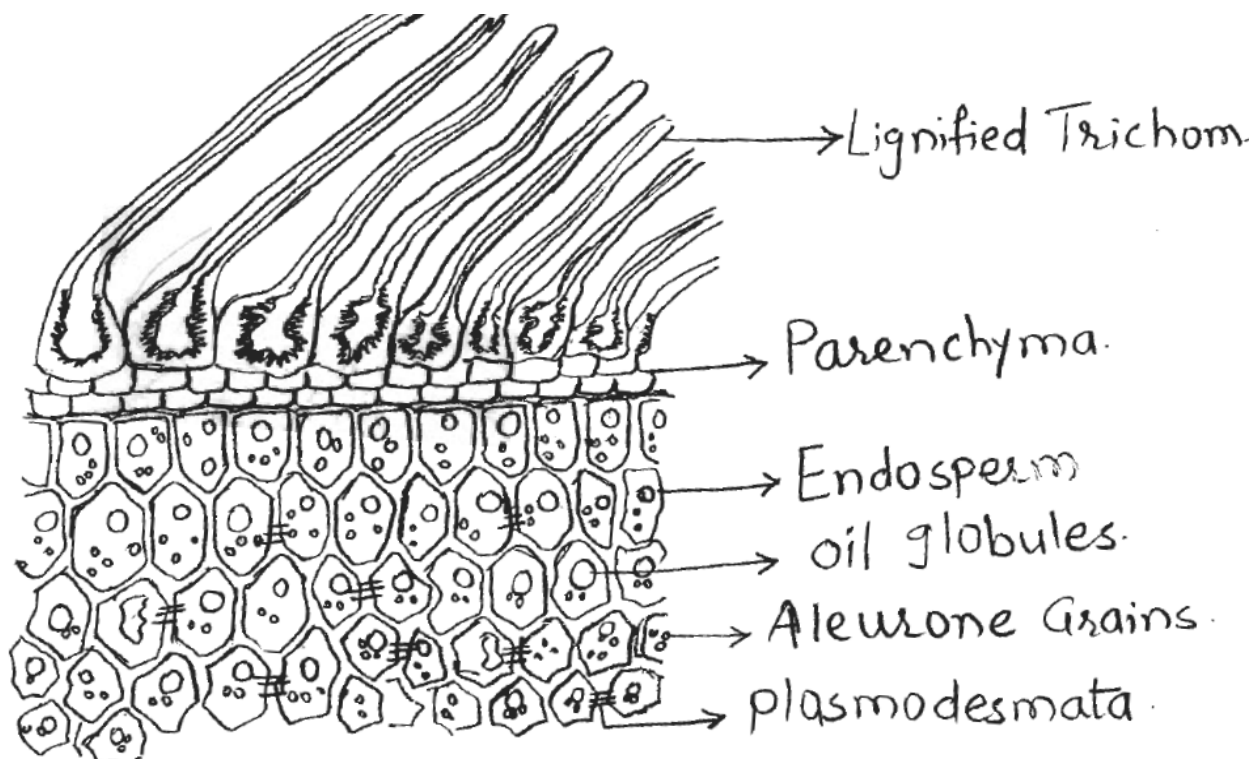


Ex. Aloe

Q.4. Any FOUR of the following.

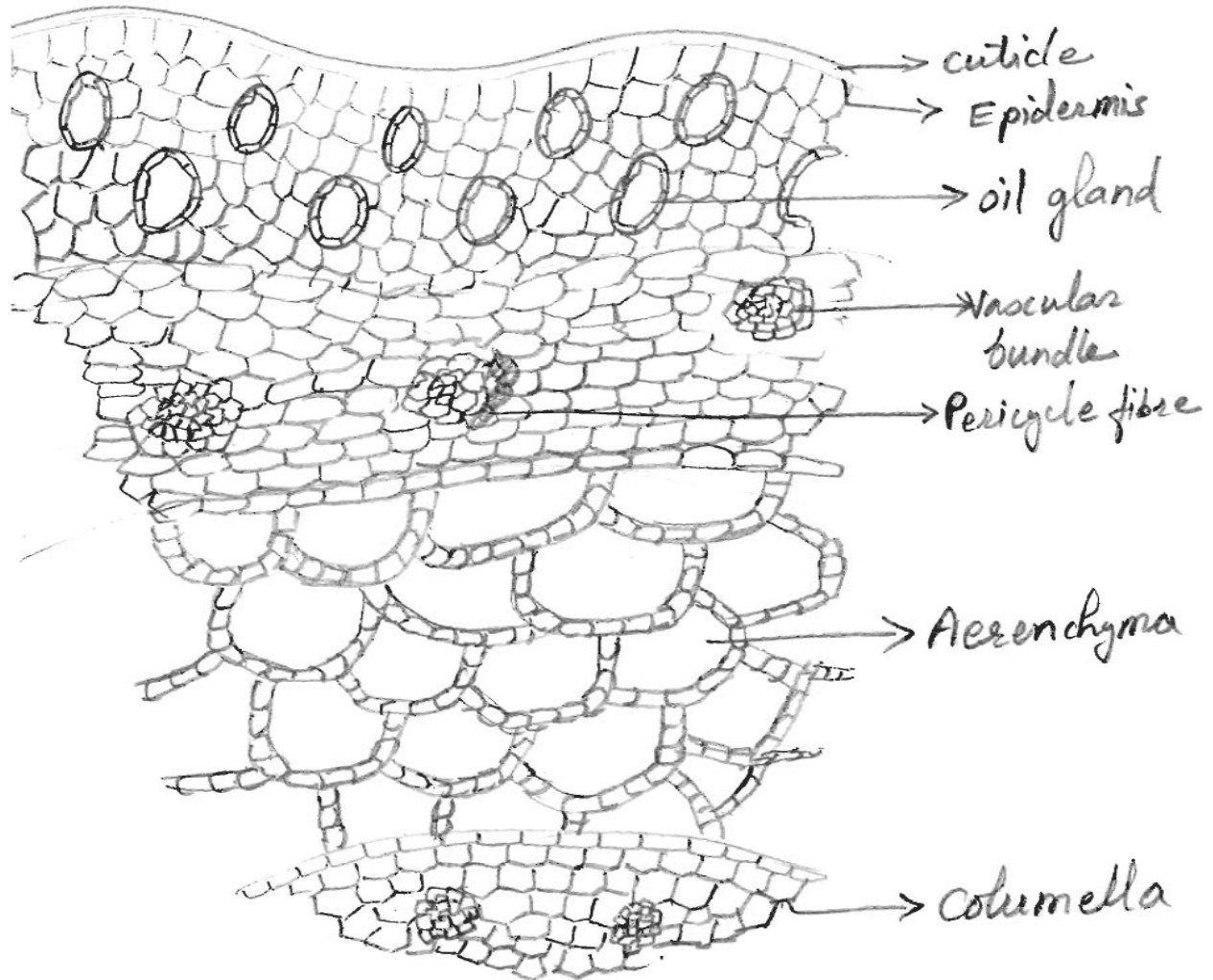
a) Draw a well labeled diagram of T.S. of Clove or Nux- vomica.

2 marks for diagram &1 mark for labels



T.S of Nuxvomica.

T. S. of clove





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b) Give biological source, Chemical constituents & uses of Vasaka.

*** 1 mark for each parameter.**

Ans. Biological source- It consist of dried as well as fresh leaves of the plant **Adhatoda vasica**, Family- Acanthaceae.

Chemical constituents-

Quinazoline alkaloids like vasicine, vasicinone & adhatodine.

Also contain small amount of essential oil & vasakin, a non- nitrogenous crystalline substance.

Uses- It is use as an Expectorant, bronchodilator & as mild bronchial antispasmodic. Vasicine possess oxytocic action.

c) What is garbling? How senna is collected & prepared for market?

***1 mark for definition of garbaling, 1mark for collection & 1mark for preparation**

Ans. Garbling it's a process of separation of sand, dirt, & foreign organic matters of same plants from dried crude drugs.

Senna is collected by hand or by machine, dried in shade, avoid overlapping of leaves, when one side is dried completely ,exposed other side of leaves for drying, separate out light coloured & green coloured leaves. Green coloured, unbroken leaves fetch more price in market.seperate leaves & pods by tossing .Separated leaves packed in air tight container.

d) What are bulk laxatives? Give biological source of any one drug use as bulk laxative.

*** 1 mark for definition of bulk laxative, 1mark for bio. Source with family & 1markfor name of laxative drug**

Ans. Laxatives when comes in contact with fluid ,it swells & increases bulk creating pressure on fecal matter & cause evacuation of bowel, are called bulk laxatives.

ISPAGHULA

1. **Part Used:** Dried seeds & husk
2. **Bio. Name:** Plantago ovata & P. psyllium
3. **Family:** Plantaginaceae



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e) Explain with suitable example how stomatal no. helps in evaluation of leaf drugs.

* 1 mark for definition of stomatal number, 1mark for Explanation & 1mark for any 1 Ex.

Ans: Stomatal No. is defined as the average number of stomata per sq. mm of epidermis of the leaf.

The actual number of stomata per sq. mm may vary for the leaves of the same plant grown in different environment or under different climatic conditions. It is however, shown that the ratio of the number of stomata to the total number of epidermal cells in a given area of epidermis is fairly constant for any age of the plant & under different climatic conditions.

Sr. No.	Drug	Stomatal number
1	Datura innoxia	141 upper epidermis
2	Cassia angustifolia	180-200 upper epidermis
3	Datura stramonium	087 upper epidermis
4	Hyoscyamus niger	125 upper epidermis

F) Differentiate between plant fibre & animal fibre.

Ans. ½ marks for each differentiating point.

Sr. no.	Plant fibre	Animal fibre
1	Obtained from plant source.	Obtained from Animal source.
2	Burns without foul odour	Burns slowly with foul odour
3	With picric acid does not gives deep yellow colour.	With picric acid gives deep yellow colour.
4	With millons reagent, on boiling do not produce red colour.	With millons reagent, on boiling produce red colour.
5	Use to produce surgical dressings.	Use to produce bandages & dressings.
6	Ex. Cotton, Jute	Ex. Silk, Wool



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Q5.Each question carries 3marks(any 4)

a).for definition 1 mark,for 4 methods ½ marks each

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

Methods of drug Adulteration.

1.Replacement by exhausted drugs

Ex.1.Exhausted saffron is coloured artificially

2.Ginger is mixed with starch & coloured.

3. The fictitious nutmegs are made from mineral matter pressed into mould & flavoured.

2.Substitution with superficially similar but inferior drugs

Ex.1. Adulteration of cloves by mother cloves.

Saffron with dried flower of carthamus tinctorius.

3.Substitution by artificially manufactured substituent

Ex.1. Paraffin wax is tinged yellow & substituted for yellow bees wax.

2. Artificial invert sugar is mixed with honey.

4.Substitution by sub- standard commercial varieties

Ex.1. capsicum frutescens(capsicum minimum), substituted by capsicum annum.

2. Alexandrian senna with Arabian senna.

3. Strychnos nux-vomica adulterated with Strychnos nux- blanda/ S. potatorum seeds.

5. Presence of organic matter obtained from the same plant

Ex.1. clove are mixed with clove stalks.

Caraway & Anethum fruits are mixed with other parts of inflorescence

6.Synthetic chemical

Ex.1. Benzyl benzoate to balsam of peru.

2.Citral to oil of lemon grass.

7.Waste from market/substitution by harmful substances

Ex.1. Limestone in asafoetida.

2.Pieces of amber coloured glass in colophony.

b) .definition 1 mark ,4 classes ½ marks each

The substances which are of little or no Therapeutic value, but are essentially used in manufacture or compounding of various pharmaceuticals are known as pharmaceutical aids

Classifiaction of P'ceutical aid

1.colour –Used to colour the product so that it become more elegant. .e.g.Turmeric,saffron

2.Diluents –Used to increase the bulk of the products e.g. Glucose, lactose

3.Disintegrating agents –Used to facilitate the break up of tablets in the G.I.T e.g. Starch,CMC,micro crystalline cellulose(MCC)

4.Binders –Used to promote cohesive compacts

Of granules during mfg.of tablets e.g. Acacia, tragacanth

5.Lubricants –Used to reduce the friction during tablet production e.g Talc, coca butter, Mg stearate.

6.Flavours- Used to increase the elegance by Stimulating sensation to taste e.g. Cardamom, Cinnamon.

7.Sweetning agent -Used to give sweet taste o the preparing e.g. Honey, saccharine.

8.Emulsifying Agent- Used to lower the interfacial tension in an emulsion e.g Acacia, agar, Tragacanth



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9.Suspending agent –To increase the viscosity of continuous phase in a suspension. e.g. Gelatin, kaolin, methyl cellulose.

10.Ointment bases- As a vehicle in the manufacturing of ointment. e.g. Bees wax, paraffin, wool fat

11.Solvents- Used as a vehicle in formulation of liquid dosage form e.g. alcohol, glycerin, propylene glycol.

c). 6 differentiating point ½ marks each.

<u>Sr.No.</u>	<u>Volatile oil</u>	<u>Fixed oil</u>
<u>1</u>	Evaporated at room temp	Not evaporated at room temp
<u>2</u>	These do not produce permanent stain on paper	Do produce permanent stain on paper
<u>3</u>	Chemically these are terpenes	Chemically they are fatty acid with glycerol and their oxygenated products.
<u>4</u>	They are not saponified by Alkali	They are saponified by Alkali
<u>5</u>	V.O do not have food value.	F.O have food value
<u>6</u>	e.g.Orange oil, Lemon oil	e.g. Arachis oil, Castor oil

d). ½ marks for any 6 parameters

1.Melting point

2.solubility

3.Viscosity

4.Refractive index`

5. moisture content

6.optical rotation

7.Ash value

8 Extractive values-1-water soluble

2.ether soluble

3.alcohol soluble.

e)1 mark for biological source.2marks for preparation

Biological source : It is Epidermal trichomes of seeds Gossypium herbaceum, G. berbadense

Famiilly: Malvaceae

PREPARATION OF ABSORBENT COTTON

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

Seeds covered with hair , known as Ba l ls .

Balls are collected , dried & taken to ginning press , where in trichomes are separated from seeds.

The hairs thus separated are called as raw cotton and the remaining hair are called as linters (linters are used for manufacturing inferior grade of cotton wool.)



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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 combers waste.This is used for manufacturing of absorbent cotton.

Remove impurities (vegetable debris) from raw co t ton

To remove wax , fatty materia l & co louring matter ,raw cotton is taken to the mach ine , cotton opener & followed by treatment w ith dil Soda solution or soda ash solution under pressure for abou t 10-15 hrs .Washed with wa ter & treated with suitable bleaching agent .Again washed, dried & make a flat sheet .Finally packed in paper wrappers & sterilized.

f)Definition 1 mark, name of drug 1 mark ,chemical constituent 1 mark

The drugs which causes the expulsion of the contents of uterus by contracting the uterine muscles are known as Oxytocic.

Ergot :

The alkaloids of ergot are the derivatives of

Lysergic acid or Isolysergic acid in combination with amino alcohol or amino acids

LEVOROTATORY ALKALOIDS (INDOLE ALKALOIDS)		DEXTROROTATORY ALKALOIDS
Ergometrine group(15%)	Ergometrine	Ergometrine
Ergotamine Group	Ergotamine Ergosine	Ergotamine Ergosine
Ergotoxine group	Ergocristine Ergocryptine Ergocomine	Ergocristine Ergocryptine Ergocomine

Q6. Each question carries 4marks(any 4)

a)clove.(2marks for 1 test, any 2 test)

1. clove is treated with strong KOH solution, needle shaped potassium eugenate crystals are observed.

2. T.S of clove when treat with phloroglucinol and conc.HCL(1:1), pink colour vascular bundle and fibres are observed.

3. Treat T.S with Dil.HCL ,calcium oxalate crystals are solubalise in it.



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b) Shark liver oil. (2marks for 1 test, any 2 test)

1. 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
2. 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

c) Senna. (4marks for 1 test, for name of the test 1 mark, 3 marks description)

Borntragers test :

Boil pdr drug with dil. sulphuric acid and filter. Mix the filtrate with organic solvent like chloroform, benzene, carbon tetrachloride and shake it. Now separate the organic layer and add equal qty. of ammonia in the organic layer which turns pink in colour and finally red.

d) Asafoetida (2marks for 1 test, any 2 test)

1. If H₂SO₄ is added on fractured surface of drug red or reddish brown colour is obtained.
2. When drug is treated with 50% nitric acid gives green colour.
3. When the drug is triturated with water, it gives yellowish orange emulsion .
4. Umbelliferon Test:- Triturate the drug with Sand and 5ml of HCL, add little quantity of water and filter. To the filtrate add equal quantity of ammonia, a blue fluorescence is produced due to umbelliferon.

e) Turmeric (1marks for 1 test , any 4)

1. Powdered drug with H₂SO₄ it gives Crimson colour
2. Powdered drug with NaOH it gives Crimson colour
3. Powdered drug with Iodine sol. it gives Bluish black color
4. with acetic anhydride and conc sulphuric acid, it gives violet colour. when this is observed under ultra violet light, red fluorescence is seen.
5. Drug + Water + Boric acid gives Reddish brown when treated with alkali it gives Greenish-blue colour.

f) Gelatin (1marks for 1 test)

1. Aq. Solution of gelatin gives ppt. with soln of tri-nitro phenol and tannic acid
2. When gelatin soln is heated with soda lime, ammonia gas is evolved.
3. Formaldehyde makes gelatin hard and insoluble after drying.
4. Gelatin gives white ppt with Millon's reagent which turns brick red on boiling.



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