

Rajiv Gandhi University of Health Sciences, Karnataka

Third Year B.Pharm Degree

[Time: 3 Hours]

[Max marks:70]

Pharmacognosy and Phytochemistry
(Revised scheme 4)**Chapter- 1: Isolation and Purification of Phytoconstituents****Long Essay:**

- 1) What is extraction? Mention the different methods of extraction. Discuss about super critical fluid extraction and its applications.
- 2) Write in detail different chromatographic methods employed for isolation and purification of phytoconstituents.
- 3) Explain different methods of extractions of crude drugs.
- 4) Enlist the methods of extraction of crude drugs and discuss preliminary phytochemical screening of phytoconstituents.
- 5)

Short Essay :

- 1) Mention the different methods of extraction. Discuss in detail maceration and percolation methodology for natural drugs.
- 2) Write the types of chromatographic techniques in separation & isolation of phytoconstituents. Discuss the role of TLC & HPTLC.
- 3) Preliminary phytochemical screening of plant metabolites.
- 4) Explain supercritical fluid extraction in detail.
- 5) Isolation and purification of phytoconstituents using TLC
- 6) Isolation and purification of phytoconstituents using Paper chromatography
- 7) Isolation and purification of phytoconstituents using column chromatography
- 8) Application of various chromatographic techniques in natural drug analysis
- 9) A brief note on HPTLC.

Short answers

- 1) Solvent selection in extractions.
- 2) Mention various secondary metabolites.
- 3) Applications of SCF.
- 4) Advantages of HPTLC over TLC.
- 5) Applications of HPLC
- 6) Applications of paper chromatography
- 7) Significance of Column chromatography.

Chapter-2 : Evaluation of Crude Drugs

Short Essay :

- 1) Discuss "Lycopodium Spore Method".
- 2) Add a note on Microscopical method
- 3) What is Biological evaluation? Explain and mention its importance.
- 4) Total Ash value and its determination.
- 5) Leaf surface constants.
- 6) What is extractive value? Mention the types & their determination.
- 7) Quantitative Microscopy.
- 8) Explain spectroscopical method of evaluation.
- 9) Discuss chemical method of evaluation.
- 10) Microscopical linear measurements.
- 11) Physical method of drug evaluation.

Short Answers :

- 1) Extractive values.
- 2) Stomatal Number and Index.
- 3) Importance of evaluation of crude drugs.
- 4) Total Ash value .
- 5) Methods of 'Moisture content' determinations.
- 6) Define evaluation.
- 7) Proximate values.
- 8) Palisade Ratio
- 9). Organoleptic evaluation

Chapter-3 : Biogenesis of phytopharmaceuticals

Short essay

- 1) Explain shikimic acid pathway .
- 2) Write isoprenoid pathway
- 3) Add a note on biosynthesis of tropane alkaloids-Atropine.
- 4) Give the biosynthesis of opium alkaloids.
- 5) Add a note on biosynthesis of anthraquinone glycosides.
- 6) Mention different technique used in elucidation of biosynthetic pathways and explain any one.
- 7) Discuss biosynthetic pathway of steroidal glycosides
- 8) Biosynthesis of an indole alkaloid .
- 9) Briefly explain basic metabolic pathway.

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Chapter-4 :Glycosides.

Long essays

- 1) Define and classify glycosides with examples. Explain general method of extraction of glycosides.
- 2) What are glycosides? . Discuss cardiac glycosides in detail.
- 3) Discuss in detail the chemistry of Anthracene glycosides with examples.
- 4) What are saponins? Explain the properties and chemistry. Discuss liquorice in detail
- 5) Explain the chemistry of flavonoids. Discuss Bio-flavonoids.
- 6) Describe the pharmacognosy of Digitalis.
- 7) Pharmacognosy of Senna
- 8) Define glycosides. Discuss about flavonoids and Cyanogenetic glycosides.

Short essays

- 1) Add a note on lactones and Bitter glycosides.
- 2) Short note on steroidal glyco -alkaloids .
- 3) Isothiocyanate glycosides .
- 4) Note on Ginseng.
- 5) .Write the Biological source, chemical constituents, diagnostic characters of Liquorice
- 6) Write the source, active principles , adulterants and uses of Senna.
- 7) Mention the Biological source, chemical constituents, specific tests and uses of Aloe
- 8) Give the Biological source, chemical constituents, specific test and uses of Digitalis.
- 9) Write the source, chemical constituents, diagnostic characters of Wild cherry bark.
- 10) Note on Cyanogenetic glycosides

Short answers

- 1) Source, chemical constituents and uses of Chirata.
- 2) Source, chemical constituents and uses of liquorice.
- 3) Source, chemical constituents and uses of Gingko.
- 4) Dioscorea.
- 5) Source, chemical constituents and uses of mustard.
- 6) Diagnostic characters of Squill.
- 7) Note on Bio-flavonoids.
- 8) Source and adulterants of digitalis.
- 9) Source and uses of Aloe.
- 10) Source and adulterants of Senna.
- 11) Keller-killani test.
- 12) Chemical test for flavonoids

- 13) Test for saponin glycosides.
- 14) Define glycosides
- 15) What are bitter glycosides? Give examples
- 16) Test for steroidal glycosides.
- 17) Modified Borntrager's test.
- 18) Dioscorea.
- 19) Source and uses of Cochineal.
- 20) Steroidal glycol- alkaloid.
- 21) Source and uses of Milk-thistle
- 22) Chemical test for cyanogenetic glycosides.
- 23) Differentiate Borntrager's test and Modified Borntrager's test.

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Chapter-5 :Alkaloids.**Long essays:**

1. Define and classify alkaloids with examples.
2. What are alkaloids? Explain their general properties and mention their general chemical tests and specific chemical tests for Quinine, Atropine and Caffeine.
3. Discuss in detail any two solanaceous drugs.
4. Discuss in detail a quinoline alkaloid.
5. Discuss the general method of extraction of alkaloids and mention their general chemical tests.
6. Pharmacognosy of opium.
7. Discuss in detail Stass Otto's method of extraction of alkaloids and mention their general chemical tests
8. What are Alkaloids? Write the chemical classification and general method of extraction of alkaloids

Short Essays:

1. Write the Biological source, chemical constituents, diagnostic characters of Ipecac.
2. Write the source, active principles, adulterants and uses of Rauwolfia.
3. Mention the Biological source, chemical constituents, specific tests and uses of cinchona.
4. Give the Biological source, chemical constituents, specific test and uses of a Tropane alkaloid.
5. Write the Biological source, chemical constituents, specific test, powder characters and uses of a steroidal alkaloidal drug.
6. Discuss in detail about Tobacco.
7. Write a note on Ergot in detail.
8. Stass Otto's method of extraction of alkaloids.
9. Write the Biological source, chemical constituents, diagnostic characters of Ephedra.
10. What are Amino alkaloids? Discuss Colchicum.

Short answers:

1. Vitalis Morien test
2. Thalleoquin test
3. Structure and test for caffeine
4. Amino alkaloids.
5. Adulterants and substituents of Rauwolfia
6. Powder characters of Ipecac.
7. Muroxide test.
8. Structure and uses of Colchicine.
9. Anti-malarial crude drug.
10. Chemical constituents and uses of Ergot.
11. Chemical constituents and uses of Aconite.

12. Source, active constituents and uses of tea
13. Taxus.
14. Structure and uses of Ephedrine
15. Diagnostic characters of Wild cherry bark

Chapter-6 :Essential oils:

Short Essays:

- 1). Write the distillation methods of extraction of volatile oils.
- 2) Discuss mechanical methods of extraction of essential oils.
- 3) Explain in brief the analysis of clove oil
- 4) Explain in brief the analysis of Cinnamon oil
- 5) Explain in brief the analysis of lemon grass oil.
- 6) A brief note on chemistry of volatile oils.
- 7) Source, diagnostic characters, active constituents and uses of clove
- 8) Source, diagnostic characters, active constituents and uses of cinnamon.
- 9) Write the production of clove oil .
- 10) Draw the structures of eugenol, cinnamic aldehyde, menthol, citral, anethol and their uses.
- 11) Write the production of cinnamon oil
- 12) Define essential oils. Classify, based on their chemical structure with examples.
- 13) General parameters for analysis of volatile oils.
- 14) Write the source and estimation of menthol in mentha oil.
- 15) Source, diagnostic characters, active constituents and uses of an umbelliferous fruit.
- 16) Briefly explain extraction of essential oils by Clevenger's apparatus.
- 17) Analytical parameters for essential oils.
- 18) Mention the Diagnostic characters & constituents of Fennel and Caraway.

Short Answers :

1. Give adulterants of clove.
2. Monoterpenes and sesquiterpenes.
3. Powder characters of clove.
4. Umbelliferous fruit.
5. Source & uses of Lemon grass oil.
6. Source, chemical composition & uses of eucalyptus oil.
7. Source, chemical composition & uses of Nutmeg.
8. Terpeneless oils.
9. Importance of volatile oils
10. Significance of essential oils
11. Principle involved in estimation of eugenol in clove oil.
12. Principle involved in estimation of Menthol in Mentha oil.
13. Phytoconstituents and uses of cinnamon oil
14. Caraway

Chapter - 7: Tannins

Short Essay :

- 1) What are Tannins? Give an account on general method of extraction and estimation methods.
- 2) Write pharmacognosy of pale catechu.
- 3) Define Tannins. Explain their properties and estimation methods.
- 4) Classify and Discuss Tannins with examples.
- 5) State the general chemical test for Tannins.
- 6) A short note on Tannins..
- 7) Source, active principles, adulterants & uses of Arjuna.
- 8) Source, General method of preparation, Active principles & uses of Black catechu.
- 9) Differentiate pale from black catechu for its source, active principles and chemical tests.

Short Answers :

- 1) What are Nutgalls? (A brief about Nutgal).
- 2) Gold beater's skin test & its significance.
- 3) How will you differentiate pale from black catechu by chemical tests?
- 4) Source and uses of Bahera.
- 5) Source and uses of Myrobalan.
- 6) Tannic acid.
- 7) General properties of Tannins.
- 8) Application of Tannins.
 - 9 . Gambier fluoresceine test
 10. Arjuna bark

Chapter-8 :Carotenoids:

Short answers:

1. Define and write the properties of Carotenoids.
2. Classify Carotenoids with examples.
3. Write the chemical nature and uses of α and β Carotenes.
4. Add a note on Lycopene.
5. Note on xanthophylls
6. Write the uses of carotenoids.

Chapter-9 :Marine Pharmacognosy:**Short answers:**

1. Define Marine Pharmacognosy.
2. Anti-cancer drugs derived from marine source.
3. Anti-microbial drugs from marine origin.
4. Classify marine source drugs with examples.
5. Cardiovascular drugs of marine source.
6. Marine derived antibiotics.
7. Marine toxins.
8. Anti-inflammatory and anti-spasmodic agents of marine origin.

Chapter-10 :Natural allergens, photosensitizing agents and fungal toxins:**Short answers:**

1. Write a note on natural allergens with examples.
2. Define photosensitizing agents with examples.
3. Write a note on fungal toxins with examples.
4. Name some adverse reactions caused by natural allergens.
5. Name some adverse reactions caused by Photosensitizing agents.