KATHMANDU UNIVERSITY
End Semester Examination
January/February 2024

01 FEB 2024

Marks Scored:

Level : B.Pharm.
Year : II

Course : PHAR 214
Semester : II

Exam Roll No. :

Time: 30 mins.

F. M. : 20

Registration No.:

Date :

SECTION "A"

**Choose and encircle the most appropriate option.** [15Q. × 1 = 15 marks]

1. Select a medicinal plant having the isoquinolene alkaloid as a major bioactive compound.
   a. *Atropa belladonna* b. *Papaver somniferum*
   c. *Areca catechu* d. *Cinchona officinalis*

2. Which compound is an oxygenated alkaloid with the heterocyclic two nitrogen rings in its structure ?
   a. Atropine b. Nicotine c. Strychnine d. Ergotamine

3. Choose a flavonoid compound belongs to the class of 'Flavones'
   a. Kaempferol b. Rutein c. Mangiferin d. Apigenin

4. Which one is a laxative glycoside that containins *C*-glycosidic linkage ?
   a. Glucuronic acid b. Glucovanillin c. Quabain d. Sinigrin

5. Which medicinal plant is harvested only after the 3 to 4 years from its plantation for better yield ?
   a. *Glycyrrhiza glabra* b. *Cassia acutifolia*
   c. *Strychnos nux-vomica* d. *Acacia catechu*

6. Which herb is well known for adaptogenic herb?
   a. Ginseng b. Tragacanth c. Thevetia d. Ipecacuanha

7. Find a medicinal plant whose dried roots are used for the treatment of syphilis
   a. Liquorice b. Rhubarb c. Dioscorea d. Sarsaparilla

8. Select the appropriate principle of column chromatography
   a. Capillary action on active compound
   b. Gravitational force on adsorbent
   c. Differential absorption of the substance on the solid phase
   d. Differential absorption of the substance on the phase

9. Which medicinal plant contains the highest percentage of alkaloid among these plants ?
   a. Coca leaves b. Ipecac roots c. Ergot sclerotia d. Datural leaves

10. Select a pathway or pathways involved in the biosynthesis of plant phenolic compounds
    a. Shikimate pathway and Acetate pathway
    b. Acetate pathway and Pentose phosphate pathway
    c. Mevalonate pathway
    d. Shikimate pathway

11. Branching of amylopectin takes place by the linkage of..... glycosidic bond between two glucose unit of the amylase.
    a. α(1→4) b. α (1→6) c. β(1→4) d. α(1→6)

12. Which group of plant metabolites possesses the potential vaso-protective property ?
    a. Salicylic acid and β-Cryptoxanthin b. Nobelitein and Tangeratin
    c. Rutin and Podophyllotoxin d. β-Carotene and Taxol

13. Which group of compounds are most important precursors of 'Vitamin A' for humans?
    a. α-carotene, zeaxanthin and lycopene b. α-carotene, violaxanthin and fucoxanthin
    c. α-carotene, β-carotene and capsanthin d. α-carotene, β-carotene and β-cryptoxanthin

14. Choose the metabolites which are useful for anti-hypertention, and anti-malaria respectively
    a. Artemisinin and Atropine b. Vanillin and Berberine
    c. Quinine and Reserpine d. Serpentine and Ephedrine

15. Select a group of medicinal plant related to the Rubiaceae family
    a. *Uncaria gambier* and *Cinchona calisaya*
    b. *Glycyrrhiza glabra* and *Cephaelis ipecacuanha*
    c. *Digitalis purpurea* and *Colchicum autumnale*
    d. *Panax ginseng* and *Cinchona calisaya*

16. Match the best suitable anatomical characters among the following medicinal plants
    [5Q. × 1 = 5 marks]

| | |
|---|---|
| Medullary rays are narrow, 2-3 cell wide | Belladonna leaf |
| Chlorenchymatous cortex, non-lignified hypodermal fires | Datura leaf |
| Polyhedral unlignified endodermal cells, but lignified trichomes | Cinchona bark |
| Glandular and non-glandular trichomes, only the anisocyatic type of stomata | Nux-vomica seed |
| Sinous epidermal wall, numerous anisocytic and some anomocytic stomata | Ephedra stem |

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SECTION "B"
[5 Q. × 3 = 15 marks]

Attempt *ANY FIVE* questions.

1. Highlight the macroscopic character and medicinal uses of Sarsaparilla.
2. Outline the isolation process of Morphine.
3. Briefly classify the plant phenolics with suitable example.
4. Write down the biological source and macroscopic character of *Uncaria gambier*.
5. Compare and contrast the chemical properties of Strophanthus and Squill.
6. Briefly write down cultivation and preparation of Papaver.
7. Write down the chemistry of Licorice.

SECTION "C"
[5 Q. × 5 = 25 marks]

Attempt *ANY FIVE* questions.

8. Write down some anticancer metabolites from plants. Elaborate the therapeutic property and mechanism of action.
9. Give an outline on biosynthesis of plant secondary metabolites.
10. What strategies are used in new drug discovery process after the isolation and identification of a compound from natural sources?
11. Give the comparative explanation on anatomical characters of Cinchona and Cascara bark with their well labelled diagrams.
12. Compare the macroscopic characters of alkaloid bearing leaf drugs. Also write down the chemistry of any indole alkaloid bearing plant.
13. Write down the chemical constituents and medicinal properties of Aloe.
14. Define and classify the plant tannin. Also explain its medicinal value with suitable example.

## SECTION "D"

[2 Q. × 7.5 = 15 marks]

Attempt *ANY TWO* questions.

15. Explain the phytochemical account on plant terpenoids.

16. Explain some non-medicinal toxic plants with emphasis on their constituents which are responsible for human toxicity and health effects.

17. Elaborate the pharmacognostical properties of digitalis leaf drug.