

PHARMACOLOGY AND THERAPEUTICS-II (Practical)

Paper 8

Marks 100

NOTE: Practical of the subject shall be designed from time to time on the basis of the above mentioned theoretical topics and availability of the facilities, e.g.

- To study the convulsant effects of strychnine and picrotoxin in frogs and to determine the site of action.
- To identify the unknown (convulsant) drug and determine its site of action.
- To study the effects of Adrenaline on Human Eyes.
- To study the effects of Pilocarpine on Human Eyes.
- To study the effect of Homatropine on Human Eyes.
- To identify and observe the effects of unknown drugs on Human Eyes.
- To study the effects of local anaesthetic drugs on human and the nerve plexus of frog.
- To identify and differentiate the effects of unknown drug on human and the nerve plexus of frog.
- To demonstrate the effects of Acetylcholine on the Rectus abdominus muscle of frog and competitive pharmacological antagonism by Neuromuscular blocking agent e.g. Gallamine.
- To identify the unknown drug by performing pharmacological competitive antagonism on Rectus abdominus muscle of Frog.
- To study the anti-coagulant effects of Heparin and oral anti-coagulants on Rabbits.
- To identify the unknown anticoagulant drug using Rabbits.
- To demonstrate the Graded Dose-Response curve of Acetylcholine on Rabbit intestine.
- To identify unknown concentration of Acetylcholine from Graded Dose Response curves.
- To demonstrate the general anesthetic effect on rabbits.
- To demonstrate the effect of sedatives and hypnotics on rabbits.
- To demonstrate the anti-nociceptive (analgesic) effect on mice.
- To demonstrate antidepressant effect in rats (forced swimming test, tail suspension test Yohimbin lethality test).

(Note: A minimum of 20 practicals will be conducted).

PHARMACOGNOSY-II (ADVANCED) (Theory)

Paper 3

Marks 100

1. **SEPARATION AND ISOLATION OF PLANT CONSTITUENTS:** Introduction and use of spectroscopic and chromatographic techniques for the identification of natural products. Description and interpretation of ultraviolet, infrared, mass, nuclear magnetic resonance ($^1\text{H-NMR}$ and $^{13}\text{C-NMR}$) and other advance techniques to elucidate the structure of natural products.
2. **CARBOHYDRATES AND RELATED COMPOUNDS:** Introduction and classification of carbohydrates, sugars as adjuvant in drugs, role of impurities in sugar substances.
 - (a) Sucrose and Sucrose containing drugs: Sucrose, Dextrose, Liquid glucose, Fructose, Lactose, Xylose, Caramel, Starch, Inulin, Dextrine etc.

- (b) Cellulose and Cellulose Derivatives: Powdered cellulose, microcrystalline cellulose, Methyl cellulose, Sodium Carboxy-methyl cellulose.
- (c) Gums and Mucilage: Tragacanth, Acacia, Sodium Alginate, Agar, Pectin.
3. **ALKALOIDS**: Introduction, Properties, Classification, Function of alkaloids in plants, Methods of extraction and identification tests.
- (a) Pyridine Piperidine Alkaloids: Areca nut, Lobelia.
- (b) Tropane Alkaloids: Belladonna, Hyoscyamus, Stramonium.
- (c) Quinoline Alkaloids: Cinchona.
- (d) Isoquinoline Alkaloids: Ipecacuanha, Opium.
- (e) Indole alkaloids: Rauwolfia, Catharanthus, Nux vomica, Physostigma, Ergot.
- (f) Imidazole alkaloids: Pilocarpus.
- (g) Steroidal alkaloids: Veratrum.
- (h) Alkaloidal amines: Ephedra, Colchicum.
- (i) Purine Bases: Tea, Coffee.
4. **GLYCOSIDES**: Introduction, classification, chemistry, extraction, isolation and medicinal uses of:
- (a) Cardioactive glycosides: Digitalis, Strophanthus and white squill.
- (b) Anthraquinone glycosides: Cascara, Aloe, Rhubarb, Cochineal and Senna.
- (c) Saponin glycosides: Glycyrrhiza, Sarsaparilla.
- (d) Cyanophore glycosides: Wild cherry.
- (e) Isothiocyanate glycosides: Black mustard.
- (f) Lactone glycosides: Cantharide.
- (g) Aldehyde glycosides: Vanilla.
- (h) Miscellaneous glycosides: Gentian, Quassia, Dioscorea.
5. **PLANT STEROIDS**: Introduction, extraction, isolation, nomenclature, sources and uses of bile acids, plant sterols, steroidal sapogenins, steroid hormones, withanolides and ecdysones.
6. **LIPIDS**: Introduction, classification, source, active constituents and pharmacological uses of:
- (a) Fixed Oils: Castor oil, Cotton seed oil, olive oil, Peanut oil, Sun flower oil, Corn oil, Coconut oil, Almond oil, Linseed oil, Mustard oil, Sesame oil and Soybean oil.
- (b) Fats and Related Compounds: Theobroma oil and Lanolin.
- (c) Waxes: Bees wax, carnauba wax, spermaceti and Jojoba oil.
7. **VOLATILE OILS (ESSENTIAL OILS)**: Introduction, significance, sources, active constituents, methods of obtaining volatile oils, chemistry and classification of:
- (a) Hydrocarbon volatile oils: Cubeb and Turpentine oil.
- (b) Alcoholic volatile oils: Peppermint, Coriander and Cardamom.
- (c) Aldehydic volatile oils: Bitter orange peel, Sweet orange peel, Lemon Cinnamon and Bitter almond oil
- (d) Ketonic volatile oils: Camphor, Spearmint, Caraway, Buchu

- (e) Phenolic volatile oils: Clove, Thyme.
- (f) Phenolic ether volatile oils: Fennel, Anise, Myristica.
- (g) Oxide volatile oils: Eucalyptus, Chenopodium.
- (h) Ester volatile oils: Rosemary.
- (i) Miscellaneous volatile oils: Allium, Anethum.

8. **RESINS AND OLEORESINS**: Introduction, classification, active constituents and pharmacological uses of jalap, turpentine, asafoetida, benzoin, rosin, cannabis, podophyllum, ipomea, myrrh, and balsam.

9. **TANNINS**: Introduction, classification, biosynthesis, extraction, identification, occurrence in plants, role in plant life and chemical study of tannins in Kino, Myrobalan, Catechu, Nutgall, Castanea and krameria.

10. **NATURAL TOXICANTS**:

- a) General Introduction to Plant Toxicology: Definition, classification and chemical nature of plant toxins. Plant toxicities in humans and animals
- b) Higher Plant Toxins: Essential oils: Terpene (cineol, pine oil), Phenyl propane (apiol, safrole, myristicin), Monoterpene (thujone, menthafuran) Plant acids (oxalic acid, amino acid, resin acid), Glycosides (cardiotonic, cyanogenic), Alkaloids (imidazole, pyrrolizidine, tropane).
- c) Lower Plant Toxins: Bacterial toxins (Staphylococcus aureus, Clostridium botulinum), Algal toxins (Microcystis aeruginosa, Cyanobacteria, Gonyaulax cantenella).
- d) Mycotoxins: Fungal toxins (Aspergillus spp., Claviceps purpurea), Mushrooms (Amanita spp.).
- e) Study of Toxins, their Prevention and Control Methods: Description, pharmacognostic features, pharmacological actions, chemical constituents, treatment, side-effects, contra-indications, warnings, prevention and control methods of Abrus precatorius, Papaver somniferum, Eucalyptus spp., Nicotiana tabaccum, Cannabis sativa, Digitalis purpurea, Datura stramonium etc. poisoning.

11. **AN INTRODUCTION TO NUTRACEUTICALS AND COSMECEUTICALS**:

12. **TUMOUR INHIBITORS FROM PLANTS**: Introduction of anticancer agents of natural origin, as Catharanthus roseus, Colchicum autumnale, Podophyllum peltatum, rifamycin antibiotics, macrolide antibiotics, anti-AIDS agents and immunostimulants.

13. **INTRODUCTION TO CLINICAL PHARMACOGNOSY**: General introduction and historical background of clinical Pharmacognosy. Study of treatment by herbal medicines.

14. CLINICAL USE OF HERBS & HERBAL MEDICINE:

Diabetes:	<i>Gymnema sylvestre, Melia azadirchta, Momordica charantia, Syzygium jambulana.</i>
Cardiac diseases:	<i>Digitalis spp., Convallaria majalis, Urgenia indica, Allium sativum, Punica granatum.</i>
Hepatitis:	<i>Berberis vulgaris, Picrorhiza kurroa, Lawsonia in.</i>
Respiratory diseases:	<i>Ficus religiosa, Adhatoda vasica.</i>
Skin diseases:	<i>Aloe vera, Angelica archangelica, Mentha piperita, Citrus spp., Commiphora mukul.</i>
CNS disorders:	<i>Strychnos nux-vomica, Datura stramonium, Cannabis sativa, Papaver somniferum, Atropa belladonna.</i>
Musculo-skeletal disorders:	<i>Nigella sativa, Phycotis ajowan, Trigonella foenum-graecum, Zingiber officinale.</i>
Renal disorders:	<i>Cucumis melo, Berberis vulgaris, Zea mays, Tribulus terrestris.</i>
Reproductive disorders:	<i>Saraca indica, Ruta graveolens, Nigella sativa, Glycyrrhiza glabra, Claviceps purpurea, Myristica fragrance.</i>
G.I.T. disorders:	<i>Foeniculum vulgare, Ferula foetida, Cuminum cyminum, Aegle marmelos, Prunus domestica.</i>

PHARMACOGNOSY-II (ADVANCED) (Practical)

Paper 9

Marks 100

NOTE: Practical of the subject shall be designed from time to time on the basis of the above mentioned theoretical topics and availability of the facilities, e.g. Extraction of the active constituents of crude drugs and chemical tests for their identification. Isolation and separation of active constituents of crude drugs by paper and thin layer chromatography.

Also include the following experiments;

- Determination of Iodine value; Saponification value and unsaponifiable matter; ester value; Acid value.
- Chemical tests for Acacia, Tragacanth, Agar, Starch, Lipids, (Castor oil, Sesame oil, Shark liver oil, Bees wax), Gelatin.

(Note: A minimum of 20 practicals will be conducted).

PHARMACY PRACTICE-II (DISPENSING, COMMUNITY, SOCIAL & ADMINISTRATIVE PHARMACY)

(Theory)

Paper 4

Marks 40+60

PART A: (DISPENSING):

(40 MARKS)

1. BASIC PRINCIPLES OF COMPOUNDING AND DISPENSING INCLUDING:

Fundamental operations in Compounding, Containers and closures for Dispensed Products,