THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY
B.PHARMACY DEGREE COURSE
PCI Regulation 2017 - SEMESTER IV
BP405T - PHARMACOGNOSY AND PHYTOCHEMISTRY I
QUESTION BANK - 2 MARK QUESTIONS WITH ANSWER KEYS

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Instructions

This question bank contains 2-mark questions covering all units of the BP405T Pharmacognosy and Phytochemistry I syllabus. Questions are designed to test foundational knowledge and understanding, suitable for internal assessments and university examinations. Answers are concise and aligned with the prescribed textbooks.

Unit I: Introduction to Pharmacognosy

1) Question: Define Pharmacognosy. [2 Marks]

2) Answer: Pharmacognosy is the study of crude drugs from natural sources like plants, animals, and minerals, focusing on their physical, chemical, and biological properties. It includes drug identification and quality evaluation. (*Kokate, p. 1*)

3) Question: What is the scope of Pharmacognosy? [2 Marks]

4) Answer: Pharmacognosy's scope includes discovering new drugs, standardizing herbal medicines, validating traditional systems, and exploring marine/microbial drugs. It aids modern drug development. (*Mohammad Ali, p. 5*)

5) Question: Differentiate between organized and unorganized drugs with one example each. [2 Marks]

6) Answer: Organized drugs have cellular structure (e.g., leaves; Example: Digitalis leaf). Unorganized drugs are secretions/exudates (e.g., gums; Example: Acacia gum). (*Kokate, p. 10*)

7) Question: What is adulteration of crude drugs? [2 Marks]

8) Answer: Adulteration is the substitution of crude drugs with inferior or extraneous materials, reducing quality. Example: Mixing starch with ginger powder. (*Mohammad Ali, p. 15*)

9) Question: Define Foreign Organic Matter in crude drugs. [2 Marks]

10) Answer: Foreign Organic Matter is unintended organic material (e.g., dirt, insects) mixed with crude drugs, not contributing to therapeutic value. It is evaluated for purity. (*Kokate, p. 20*)

11) Question: Explain alphabetical classification of crude drugs. [2 Marks]

12) Answer: Alphabetical classification arranges crude drugs by their common or botanical names in alphabetical order. Example: Belladonna, Cinchona, Digitalis. (*Kokate, p. 12*)

13) Question: What is morphological classification of crude drugs? [2 Marks]

14) Answer: Morphological classification groups crude drugs by plant part or form (e.g., roots, leaves). Example: Rauwolfia root, Senna leaf. (*Mohammad Ali, p. 10*)

15) Question: Define taxonomical classification. [2 Marks]

16) Answer: Taxonomical classification organizes crude drugs based on their botanical classification (family, genus, species). Example: Solanaceae drugs like Belladonna. (*Kokate, p. 13*)

17) Question: What is pharmacological classification? [2 Marks]

18) Answer: Pharmacological classification groups crude drugs by their therapeutic effects. Example: Analgesics (Opium), Cardiotonics (Digitalis). (*Mohammad Ali, p. 12*)

19) Question: Define chemical classification of crude drugs. [2 Marks]

20) Answer: Chemical classification groups crude drugs by their active chemical constituents. Example: Alkaloid-containing drugs like Cinchona. (*Kokate, p. 14*)

21) Question: Give two examples of plant-derived crude drugs. [2 Marks]

22) Answer: 1. Opium (Papaver somniferum). 2. Senna (Cassia angustifolia). (*Kokate, p. 8*)

23) Question: Give two examples of animal-derived crude drugs. [2 Marks]

24) Answer: 1. Beeswax (Apis mellifera). 2. Gelatin (bovine/pig bones). (*Mohammad Ali, p. 18*)

25) Question: What is substitution in adulteration? [2 Marks]

26) Answer: Substitution is replacing a crude drug with a different species or part. Example: Capsicum frutescens for Capsicum annum. (*Kokate, p. 16*)

27) Question: Define crude drug. [2 Marks]

28) Answer: A crude drug is a natural product (plant, animal, or mineral origin) used in medicine, dried or processed but not purified. Example: Rauwolfia root. (*Mohammad Ali, p. 3*)

29) Question: What is chemotaxonomy? [2 Marks]

30) Answer: Chemotaxonomy classifies plants based on their chemical constituents (e.g., alkaloids, flavonoids) to determine relationships. Example: Solanaceae with tropane alkaloids. (*Kokate, p. 15*)

31) Question: What is serotaxonomy? [2 Marks]

32) Answer: Serotaxonomy uses serological reactions of plant proteins to classify plants. Example: Identifying Leguminosae species by protein profiles. (*Mohammad Ali, p. 22*)

Unit II: Cultivation, Collection, Processing, and Evaluation of Crude Drugs

1) Question: Define stomatal number. [2 Marks]

2) Answer: Stomatal number is the average number of stomata per square millimeter

of leaf epidermis, used for drug identification. Example: Digitalis leaf. (*Kokate, p. 95*)

3) Question: What is stomatal index? [2 Marks]

4) Answer: Stomatal index is the percentage ratio of stomata to total epidermal cells, calculated as $S.I. = \frac{S}{E+S} \times 100$. Example: Used for Senna. (*Mohammad Ali, p. 30*)

5) Question: Define vein islet number. [2 Marks]

6) Answer: Vein islet number is the number of vein islets per square millimeter of leaf surface, used for authentication. Example: Digitalis leaf. (*Kokate, p. 96*)

7) Question: What is veinlet termination number? [2 Marks]

8) Answer: Veinlet termination number is the number of veinlet endings per square millimeter of leaf, aiding identification. Example: Cassia leaf. (*Mohammad Ali, p. 31*)

9) Question: What is Ash value? [2 Marks]

10) Answer: Ash value is the inorganic residue after incinerating a crude drug, indicating mineral content. Includes total ash and acid-insoluble ash. (*Kokate, p. 98*)

11) Question: Define extractive value. [2 Marks]

12) Answer: Extractive value is the amount of soluble material extracted from a crude drug using solvents (e.g., water, alcohol), indicating active constituents. (*Mohammad Ali, p. 28*)

13) Question: What is Loss on Drying? [2 Marks]

14) Answer: Loss on Drying measures the moisture content of a crude drug by heating it to constant weight, ensuring stability. Example: Used for opium. (*Kokate, p. 97*)

15) Question: List two methods for drying crude drugs. [2 Marks]

16) Answer: 1. Sun drying (e.g., cloves). 2. Oven drying (e.g., Digitalis leaves). (*Mohammad Ali, p. 50*)

17) Question: Name two pest control methods in cultivation. [2 Marks]

18) Answer: 1. Chemical control (pesticides). 2. Biological control (predators like ladybugs). (*Kokate, p. 45*)

19) Question: What is organoleptic evaluation? [2 Marks]

20) Answer: Organoleptic evaluation assesses crude drugs using sensory properties like color, odor, taste, and texture. Example: Clove's aromatic odor. (*Mohammad Ali, p. 25*)

21) Question: Define microscopical evaluation. [2 Marks]

22) Answer: Microscopical evaluation examines crude drugs' cellular structures under a microscope to confirm identity. Example: Stomata in Senna leaf. (*Kokate, p. 94*)

23) Question: What is chemical evaluation? [2 Marks]

24) Answer: Chemical evaluation tests for specific active constituents in crude drugs using reagents. Example: Alkaloid test for Cinchona. (*Mohammad Ali, p. 27*)

25) Question: Define biological evaluation. [2 Marks]

26) Answer: Biological evaluation assesses crude drugs' pharmacological activity using bioassays. Example: Testing Digitalis on guinea pigs. (*Kokate, p. 100*)

27) Question: What is grafting in cultivation? [2 Marks]

28) Answer: Grafting is joining a scion (desired plant) to a rootstock to propagate plants with specific traits. Example: Citrus plants. (*Mohammad Ali, p. 40*)

29) Question: Define polyploidy in cultivation. [2 Marks]

30) Answer: Polyploidy is inducing multiple chromosome sets to enhance drug yield. Example: Tetraploid Datura. (*Kokate, p. 47*)

31) Question: What is the role of soil in cultivation? [2 Marks]

32) Answer: Soil provides nutrients and affects drug quality; pH and fertility are critical. Example: Alkaloid-rich soils for Rauwolfia. (*Mohammad Ali, p. 42*)

33) Question: Define drying in crude drug processing. [2 Marks]

34) Answer: Drying removes moisture from crude drugs to prevent microbial growth and preserve quality. Example: Sun drying for ginger. (*Kokate, p. 49*)

Unit III: Plant Tissue Culture

1) Question: Define plant tissue culture. [2 Marks]

2) Answer: Plant tissue culture is the in vitro cultivation of plant cells, tissues, or organs under sterile conditions to regenerate plants or produce metabolites. (*Kokate, p. 135*)

3) Question: What is totipotency? [2 Marks]

4) Answer: Totipotency is a plant cell's ability to regenerate into a complete plant, the basis of tissue culture. Example: Carrot cell culture. (*Mohammad Ali, p. 150*)

5) Question: Define explant. [2 Marks]

6) Answer: An explant is a plant tissue (e.g., leaf, stem) used to initiate tissue culture. Example: Leaf of Catharanthus roseus. (*Kokate, p. 136*)

7) Question: What is a callus? [2 Marks]

8) Answer: Callus is an undifferentiated cell mass formed from an explant in tissue culture, used for metabolite production. (*Mohammad Ali, p. 138*)

9) Question: Define cryopreservation. [2 Marks]

10) Answer: Cryopreservation is storing plant tissues at -196°C in liquid nitrogen for long-term preservation. Example: Germplasm storage. (*Kokate, p. 155*)

11) Question: What is micropropagation? [2 Marks]

12) Answer: Micropropagation is the rapid multiplication of plants using tissue culture for clonal propagation. Example: Banana plantlets. (*Mohammad Ali, p. 145*)

13) Question: Define polyploidy in tissue culture. [2 Marks]

14) Answer: Polyploidy is inducing multiple chromosome sets to enhance metabolite production. Example: Tetraploid Nicotiana. (*Kokate, p. 147*)

15) Question: What is a chemically undefined medium? [2 Marks]

16) Answer: A chemically undefined medium contains natural extracts (e.g., coconut milk) with unknown composition for tissue culture. (*Mohammad Ali, p. 152*)

17) Question: Define hairy root culture. [2 Marks]

18) Answer: Hairy root culture uses Agrobacterium rhizogenes to induce roots for secondary metabolite production. Example: Atropine from Datura. (*Kokate, p. 140*)

19) Question: What is protoplast culture? [2 Marks]

20) Answer: Protoplast culture involves culturing isolated plant protoplasts to regenerate plants or hybrids. Example: Tobacco hybrids. (*Mohammad Ali, p. 142*)

21) Question: Define embryo culture. [2 Marks]

22) Answer: Embryo culture is the in vitro growth of isolated plant embryos to rescue hybrids. Example: Orchid embryos. (*Kokate, p. 141*)

23) Question: What is an inoculum? [2 Marks]

24) Answer: Inoculum is the initial plant material (e.g., explant) introduced into a culture medium to start tissue culture. (*Mohammad Ali, p. 151*)

25) Question: Name two sterilizing agents in tissue culture. [2 Marks]

26) Answer: 1. Mercuric chloride (0.1%). 2. Ethanol (70%). (*Kokate, p. 137*)

27) Question: What is the role of sucrose in tissue culture? [2 Marks]

28) Answer: Sucrose (2–3%) serves as a carbon/energy source in tissue culture media. Example: MS medium. (*Mohammad Ali, p. 153*)

29) Question: Define mutation in tissue culture. [2 Marks]

30) Answer: Mutation is a genetic change induced in tissue culture to improve traits. Example: Colchicine-induced polyploidy. (*Kokate, p. 146*)

31) Question: What is germplasm conservation? [2 Marks]

32) Answer: Germplasm conservation preserves plant genetic material using tissue culture or cryopreservation. Example: Potato germplasm. (*Mohammad Ali, p. 156*)

Unit IV: Phytochemistry

1) Question: What is the Keller-Killiani test? [2 Marks]

2) Answer: Keller-Killiani test detects cardiac glycosides, producing a blue-green color with glacial acetic acid, ferric chloride, and sulfuric acid. Example: Digitalis. (*Kokate, p. 205*)

3) Question: Define secondary metabolites with two examples. [2 Marks]

4) Answer: Secondary metabolites are non-essential compounds with therapeutic value. Examples: Morphine (alkaloid), Quercetin (flavonoid). (*Mohammad Ali, p. 75*)

5) Question: Give the biological source and uses of beeswax. [2 Marks]

6) Answer: Source: Apis mellifera (Apidae). Uses: Ointment base, cosmetics. (*Kokate, p. 255*)

7) Question: What is the Cuoxam test? [2 Marks]

8) Answer: Cuoxam test detects cellulose in fibres, forming a blue solution in ammoniacal copper oxide. Example: Cotton. (*Mohammad Ali, p. 90*)

9) Question: Name two plant hallucinogens. [2 Marks]

10) Answer: 1. Mescaline (Peyote cactus). 2. Psilocybin (Psilocybe mushrooms). (*Kokate, p. 210*)

11) Question: What is the Goldbeater's skin test? [2 Marks]

12) Answer: Goldbeater's skin test detects tannins, causing a dark brown color on treated animal membrane. Example: Catechu. (*Mohammad Ali, p. 85*)

13) Question: Define glycosides with one example. [2 Marks]

14) Answer: Glycosides are compounds with a sugar moiety linked to a non-sugar aglycone. Example: Digitoxin (Digitalis). (*Kokate, p. 200*)

15) Question: What is the Thalleoquin test? [2 Marks]

16) Answer: Thalleoquin test detects quinoline alkaloids, producing a green color with bromine and ammonia. Example: Cinchona. (*Mohammad Ali, p. 82*)

17) Question: Give the source and use of agar. [2 Marks]

18) Answer: Source: Gelidium amansii (Gelidiaceae). Use: Culture media, laxative. (*Kokate, p. 250*)

19) Question: What are flavonoids? Give one example. [2 Marks]

20) Answer: Flavonoids are polyphenolic secondary metabolites with antioxidant properties. Example: Rutin. (*Mohammad Ali, p. 78*)

21) Question: Define alkaloids with one example. [2 Marks]

22) Answer: Alkaloids are nitrogenous compounds with pharmacological activity. Example: Morphine (Opium). (*Kokate, p. 202*)

23) Question: What are volatile oils? Give one example. [2 Marks]

24) Answer: Volatile oils are aromatic, volatile compounds extracted by distillation. Example: Peppermint oil. (*Mohammad Ali, p. 88*)

25) Question: Define tannins with one example. [2 Marks]

26) Answer: Tannins are polyphenolic compounds that precipitate proteins. Example: Catechin (Catechu). (*Kokate, p. 207*)

27) Question: Give the source and use of gelatin. [2 Marks]

28) Answer: Source: Bovine/pig bones (animal origin). Use: Capsule shells, emulsifier.

(*Mohammad Ali, p. 260*)

29) Question: What is bromelain? Mention one use. [2 Marks]

30) Answer: Bromelain is a proteolytic enzyme from pineapple (Ananas comosus). Use: Anti-inflammatory agent. (*Kokate, p. 265*)

31) Question: Name two marine-derived drugs. [2 Marks]

32) Answer: 1. Ziconotide (cone snail). 2. Cytarabine (sponge). (*Mohammad Ali, p. 95*)

33) Question: What is streptokinase? [2 Marks]

34) Answer: Streptokinase is an enzyme from Streptococcus bacteria used as a thrombolytic agent to dissolve blood clots. (*Kokate, p. 267*)

Unit V: Traditional Systems of Medicine and Miscellaneous

1) Question: Write the basic principles of Homeopathy. [2 Marks]

2) Answer: Homeopathy follows "like cures like" and uses highly diluted substances to stimulate healing. It emphasizes minimum dose and individualization. (*Kokate, p. 300*)

3) Question: What are natural allergens? Give one example. [2 Marks]

4) Answer: Natural allergens are substances causing allergic reactions. Example: Ragweed pollen (hay fever). (*Mohammad Ali, p. 220*)

5) Question: Define teratogens with one example. [2 Marks]

6) Answer: Teratogens cause congenital abnormalities in fetuses. Example: Thalidomide (limb deformities). (*Kokate, p. 215*)

7) Question: Name two Leguminosae family drugs. [2 Marks]

8) Answer: 1. Liquorice (Glycyrrhiza glabra). 2. Senna (Cassia angustifolia). (*Mohammad Ali, p. 100*)

9) Question: What is the Chinese system of medicine? [2 Marks]

10) Answer: Chinese medicine balances yin-yang and qi using herbs, acupuncture, and diet. Example: Ginseng for vitality. (*Kokate, p. 305*)

11) Question: Define Ayurveda. [2 Marks]

12) Answer: Ayurveda is a traditional Indian system using herbs, diet, and lifestyle to balance body doshas (Vata, Pitta, Kapha). (*Mohammad Ali, p. 295*)

13) Question: What is the Siddha system? [2 Marks]

14) Answer: Siddha is a South Indian system using herbs, minerals, and yoga to balance humors for health. Example: Use of mercury preparations. (*Kokate, p. 302*)

15) Question: What are edible vaccines? [2 Marks]

16) Answer: Edible vaccines are genetically engineered plants producing antigens for immunization. Example: Hepatitis B antigen in banana. (*Mohammad Ali, p. 225*)

17) Question: Define conservation of medicinal plants. [2 Marks]

18) Answer: Conservation of medicinal plants involves protecting endangered species through cultivation or in situ preservation. Example: Rauwolfia serpentina. (*Kokate, p. 310*)

19) Question: What is ballooning effect in cotton? [2 Marks]

20) Answer: Ballooning effect is the swelling of cotton fibres in ammoniacal copper oxide, confirming cellulose presence. (*Mohammad Ali, p. 92*)

21) Question: Give the source and use of jute. [2 Marks]

22) Answer: Source: Corchorus olitorius (Tiliaceae). Use: Surgical dressings, sacks. (*Kokate, p. 270*)

23) Question: What is tragacanth? Give one use. [2 Marks]

24) Answer: Tragacanth is a gum from Astragalus gummifer (Leguminosae). Use: Suspending agent in pharmaceuticals. (*Mohammad Ali, p. 252*)

25) Question: Define fibres with one example. [2 Marks]

26) Answer: Fibres are elongated plant cells used in textiles or medicine. Example: Cotton (Gossypium herbaceum). (*Kokate, p. 275*)

27) Question: What is serratiopeptidase? [2 Marks]

28) Answer: Serratiopeptidase is a proteolytic enzyme from Serratia bacteria, used as an anti-inflammatory agent. (*Mohammad Ali, p. 268*)

29) Question: Give the source and use of wool fat. [2 Marks]

30) Answer: Source: Sheep wool (Ovis aries). Use: Emollient in ointments. (*Kokate, p. 258*)

31) Question: What is the palisade ratio? [2 Marks]

32) Answer: Palisade ratio is the average number of palisade cells beneath one epidermal cell in a leaf, used for identification. Example: Atropa belladonna. (*Mohammad Ali, p. 32*)