



KENYATTA UNIVERSITY

EXAMINATION FOR THE DEGREE OF BACHELOR OF PHARMACY

PPD 320: PHARMACOGNOSY II

1ST SEMESTER 2022/2023

TIME: 3 HOURS

INSTRUCTIONS:

1. The paper consists of three sections; A, B and C
2. Answer all questions
3. Answer sections A, B and C in separate booklets

SECTION A: OILS FATS AND WAXES

Multiple Choice Questions: Select only one correct answer, 1 mark for each correct answer

1. Which of the following is an unsaturated fatty acid?

- A. Myristic acid
- B. Oleic acid
- C. Palmitic acid
- D. Stearic acid

2. Fixed oils can be converted to fats by;

- A. Hydrolysis
- B. Hydrogenation
- C. Saponification
- D. oxidation of double bond

3. Fats differ from waxes in that fats have:

- A. More unsaturation
- B. lower melting points
- C. A glycerol backbone
- D. Longer fatty acids

4. Which of the following statements best describes the structure of waxes?
- A. long-chain unsaturated carboxylic acids
 - B. long-chain saturated carboxylic acids
 - C. long-chain esters
 - D. long-chain ethers
5. Which of the following statements is correct?
- A. Fixed oils contain saturated triglycerides
 - B. Fixed oils are always liquids at ambient temperature
 - C. Fixed oils have lower melting points than fatty acids
 - D. None of the above
6. Rancidity of lipids containing food is due to
- A. Hydrogenation of unsaturated fatty acids
 - B. Reduction of fatty acids
 - C. Oxidation of fatty acids
 - D. Dehydrogenation of saturated fatty acids
7. The chief active constituent of fennel is:
- A. Carvone
 - B. Borneol
 - C. Fenniol
 - D. Fenchone
8. Which of the following essential oil does not have counter irritant property?
- A. Cinnamon
 - B. Camphor
 - C. Peppermint
 - D. Nutmeg
9. Which of the following is NOT an oleoresin?
- A. Benzoin
 - B. Turpentine
 - C. Capsicum
 - D. Ginger

10. The chief active principle of the Male Fern resin is;

- A. Filmarone
- B. Benzoic acid
- C. Podophyllotoxin
- D. Cinnamic acid

Indicate if True or False: 1 mark for each correct answer

- 1. Sumatra benzoin is used for fixing the taste of pharmaceutical preparations.
- 2. Coriander can be used to treat the adverse effects on bile secretion caused by podophyllum.
- 3. Carnauba wax is used as glazing agent for tablets.
- 4. The mandrake root has antitumour activity due to the alkaloid podophyllotoxin.
- 5. Castor oil is a drying oil.
- 6. Partial hydrogenation of vegetable oils in the presence of Ni catalyst at 200°C gives a margarine.
- 7. Lemon grass oil is obtained from *Cymbopogonlemoneosus*.
- 8. Balsams are resinous substances which contain large proportions of gums, resins and volatile oils.
- 9. The synonym for peppermint oil is Brandy mint.
- 10. Lanolin is used as a base in Deep heat ointment.

Fill in the blank spaces: 1 mark for each correct answer

- 1. For canola oil,are removed by adding sodium hydroxide solution.
- 2. Spermaceti is obtained from the,
Physeter catodon
- 3. Lanolin is obtained fromof sheep, *Ovis aries*.
- 4. is a method of obtainingfrom flowers that has natural scent.
- 5. Drying oils when exposed to air, undergoand double bonds open up forming
- 6. Resins produced by cells are known aswhile those formed when the plant is injured are referred to as

INVOLVEMENT IN ANY EXAMINATION IRREGULARITY SHALL LEAD TO DISCONTINUATION

7. Volatile oils differ from fixed oils in that they..... at room temperature.

Short Answer Questions

11. For each of the following health conditions, suggest one essential oil that can be used to manage it. (10 marks)

- a. Inflammation
- b. Headache
- c. Toothache
- d. Itching
- e. Throat infection
- f. Snake Bite
- g. Malaria
- h. Chronic bronchitis
- i. Appetite
- j. Depression

SECTION B: GLYCOSIDES

Multiple Choice Questions: Select only one correct answer, 1 mark for each correct answer

1. All of the following contain Anthraquinone glycosides except
 - a. Cascara
 - b. Rhubarb
 - c. Aloe
 - d. Dioscorea
2. Which of the following is not a derivative of anthraquinones?
 - a. Chrysophanol
 - b. Emodine
 - c. Carmic acid
 - d. Prunasin
3. All of the following plants are biological sources of saponins except:
 - a. *Glycyrrhizaglabra*
 - b. *Saponaria officinalis*
 - c. *Smilax febrifuga*
 - d. *QuinteaSaponaria*

4. Which of the following cannot be precipitated by tannins?
 - a. Proteins
 - b. Heavy metals
 - c. Gelatins
 - d. Simple sugars
5. Which among the following glycones constitutes cyanogenic glycosides?
 - a. Linamarin and amygdalin
 - b. Digoxin and gitaloxin
 - c. Gingsenosides and dianthrone
 - d. None of the above
6. Which among the following is true about glycosides?
 - a. They are polar substances
 - b. They can be extracted using a mixture of water and alcohol
 - c. Majority of naturally occurring glycosides are β -glycosides
 - d. All of the above
7. All of the following are industrial applications of tannins except?
 - a. Ink manufacture
 - b. Vegetable tanning
 - c. Preservatives
 - d. Antidotes
8. Which one among the following is not true about steroidal saponins
 - a. Present in glycyrrhizaglabra
 - b. Less distributed in nature
 - c. Mostly abundant in monocotyledonous plants
 - d. Majority have significant Pharmaceutical importance
9. Which one among the following is not constituent of aloes
 - a. Barbaloin
 - b. Aloe A and B
 - c. Aloinosides A and B
 - d. Aloeresin A and C
10. Which one among the following should be a constituent in Senna allied drugs?
 - a. Aloe emodin
 - b. Sennoside A and B
 - c. a and b
 - d. Hypericin

Indicate if True or False: 1 mark for each correct answer

11. Anthraquinone glycosides can irritate the intestinal mucosa if misused
12. *Digitalis purpurea* is the biological source of scillaren A and B
13. Digoxin is an example of a bufanolide
14. There is likely to be decreased bioavailability of digoxin when combined with St. John's Wort because of herb drug interactions
15. Hecogenin is a saponin
16. Cadenolides are characterized by one double bond, one lactone five membered ring and digoxin is an example
17. Guignard test is ideal for cyanogenic glycosides
18. *Rhumnuspurshiana* is the biological source of rhein
19. Glycyrrhizin is antitusive and anti-inflammatory
20. Digitoxin acts as a laxative

Short Answer Questions

21. Describe two types of Saponins (3 marks)
22. Use figure 1 below to answer the questions that follow

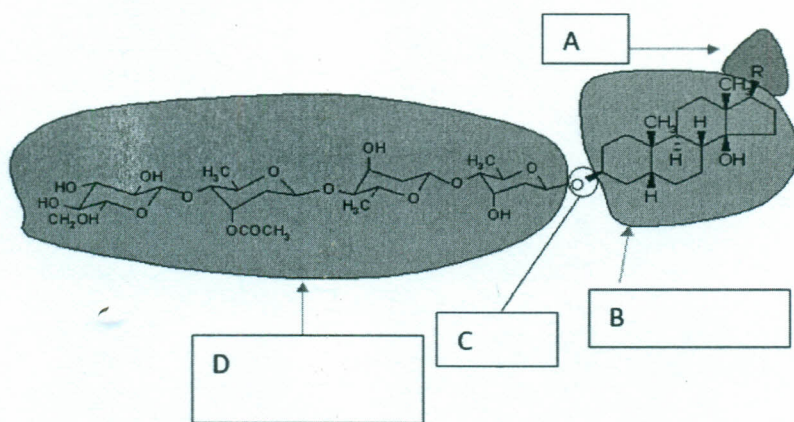


Figure 1

- a. Name the parts labelled A, B, C and D (4 marks)
- b. State the functions for parts B, C and D (3 marks)

Essay

23. Describe five methods you may use to reduce cyanogenic toxicity in cassava (10 marks)

SECTION C: ALKALOIDS

Multiple Choice Questions: Select only one correct answer, 1 mark for each correct answer

1. Which of the following statements is true about alkaloids in plants
 - a. Plants often contain more than one class of alkaloids
 - b. Alkaloids are usually localised in one organ
 - c. Alkaloids are mostly synthesised aerial parts
 - d. Alkaloids are essential for normal metabolic processes
2. Which of the following tests is specific for the identification of tropane alkaloids
 - a. Wagner's reaction
 - b. Dragendorff reaction
 - c. Keller-Kiliani reaction
 - d. Vitali-Morin reaction
3. From which amino acid is the quinoline ring typically synthesised from?
 - a. Tryptophan
 - b. Phenylalanine
 - c. Tyrosine
 - d. Ornithine
4. If a given drug sample gives a positive result for the Van-Urk's test, which alkaloid group is likely to be present?
 - a. Purine alkaloids
 - b. Isoquinoline alkaloids
 - c. Imidazole alkaloids
 - d. Indole alkaloids
5. Which of the following tests is specific for the identification of purine alkaloids?
 - a. Meyer's reagent
 - b. Hager's reagent
 - c. Murexide reagent
 - d. VitaliMorrin reagent
6. Which of the following alkaloid groups is not precipitated by Meyer's reagent?
 - a. Purine alkaloids
 - b. Tropane alkaloids
 - c. Quinoline alkaloids
 - d. Terpenoid alkaloids
7. Which of the following alkaloids is used as an antidote in atropine poisoning?
 - a. Strychnine
 - b. Physostigmine

- c. Brucine
 - d. Pilocarpine
8. Which of the following statements is true about purine alkaloids. They
- a. are very weak acids, they form salts only with strong bases
 - b. are very weak bases, they form salts only with strong acids
 - c. are very weak acids, they form salts only with weak bases
 - d. are very weak bases, they form salts only with weak acids
9. _____ neurotransmitter has structural similarities to the tropane ring
- a. Dopamine
 - b. Adrenaline
 - c. Acetylcholine
 - d. Serotonin
10. The following compounds can be classified as pseudo alkaloids except:
- a. Aconitine
 - b. Valerianine
 - c. Theophylline
 - d. Strychnine

Short Answer Questions

11. Explain why, despite being effective in the treatment of various medical conditions, there is limited use of the cinchona bark or compounds derived from it in modern medicine (3 marks)
12. With regard to pilocarpus:
- a. describe its geographical, botanical and organ source (2 marks)
 - b. describe its biosynthesis from L-histidine (4 marks)
 - c. list four clinical uses of the major alkaloid obtained from it (2 marks)
13. Pyrrolizidine alkaloids are derived from the bicyclic pyrrolizidine ring shown below;

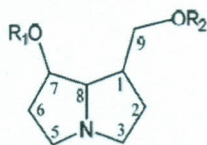


Figure 2: Pyrrolizidine ring nucleus

- a. Name two plant species endemic to Kenya that contain these alkaloids
(1 mark)
- b. Describe the structural features associated with pyrrolizidine alkaloid toxicity
(3 marks)
- c. Demonstrate how pyrrolizidine alkaloids are activated to their more toxic metabolites in the human body
(3 marks)
- d. Explain why toxicity is more selective to the liver compared to other organs
(2 marks)

Essay

- 14. Giving appropriate examples, discuss the traditional and modern medicinal uses of purine alkaloids
(10 marks)