



October University for Modern Sciences & Arts Midterm Exam Model Answer

Faculty	Pharmacy
Department	Pharmacognosy
Module Code	PHG 112
Module Title	Pharmacognosy
Semester	Fall 2022 (78)
Date	
Time Allowed	1 hour
Total Mark	30 Marks
No. of Pages	5
Material provided	-
Equipment permitted	-
Additional Instructions	All Answers must be in English otherwise it will not be considered.

No books, paper or electronic devices are permitted to be brought into the examination room other than those specified above.

All questions should be answered. Illustrate your answer with a drawing whenever required.
 The exam contains four pages. 30 Marks

Question 1: (15 marks)

Complete the given table, then answer the following questions: (11.5 marks/0.5 mark each)

	Plant name	origin	Main active constituent	One use	Type of out growth	One key element	Type of embryo
A	Black mustard	the dried ripe seeds of <i>Brassica nigra</i> family Brassicaceae (Cruciferae)	Thioglycoside (glucosinolate) sinigrin	Spice Externally: Rubefacient and counter irritant		-Epidermis with Mucilage -Sclerides of unequal heights	-Orthoplocus
B	Foenugreek	The dried ripe seeds of <i>Trigonella foenum-graecum</i> Linne Family Leguminosae.	-Mucilage upon hydrolysis(mannose & galactose) -Alkaloids: Gentianine trigonelline & choline -Flavonoids Apigenin, luteolin, vitexin & quercetin. -saponins glycosides steroidal sapogenin, gitogenin	Lactagogue		The palisade-like epidermis and basket-like cells of the hypoderms	
C	Strophanthus		mixture of cardiac glycosides K – strophanthin & K - strophanthoside	1- Cardiac stimulant and cardiogenic 2-It raises the blood pressure	awn	1 - Thin-walled hairs showing one lignified rib 2 - Fragments showing the elongated cells of	Straight

				3- Efficient diuretic.		epidermis with hairs or circular scars of broken hairs
D	Nutmeg	It is dried ripe seeds of <i>Myristica fragrans</i>F. Myristicaceae	1-Volatile oil which contain myristicin and elemicin 2. Solid fat Consists chiefly of the fixed oil of Nutmeg containing trimyristcin with a small amount of volatile oil. 3. Starch	-Helps eliminate bad breath -provide relief for insomnia -Reduce skin inflammation	Mace	
E	Colchicum		1- Alkaloid colchicine 2- Fixed oil	1-It relieves the pain and inflammation of acute gout 2- Plant hormone, it induces polyploidy 3- Cytotoxic effect on cancerous cells	Strophiole	
	Psyllium		1-Acidic mucilage 2- Small amount of glycoside. 3- Fixed oil - protein.	Safe as a laxative in pregnancy		

- Referring to plants from (A to F), answer the following questions: (3.5 marks)

- 1- Test for purity: Macerate 2 gm. of powdered Black mustard with 20 ml of water for 15 minutes, filter, add to the filtrate a few drops of Hg (NO₃)₂ T.S and warm, No red colour is produced. (0.5 mark)
- 2- Hypersensitive skin and peptic ulcer.
 Severe circulatory damage and varicose veins. (0.5 mark)
- 3- The other species of this drug is white mustard (0.75 mark)

	<i>Sinapis Nigrae</i>	<i>Sinapis Alba</i>
Histology:		
1- Hypodermis	layer of large thin-walled cells (giant cells)	formed of 2 layers of collenchyma
2-Sclerides	layer of small narrow, polygonal radially elongated cells, varying in height, and thickened on the radial and inner walls	Sclereids are much more even in height. No polygonal network in surface view of testa
3-Pigment layer	thin-walled cells, filled with dark brown contents	The pigment layer is devoid of colouring matter

- 4- Foenugreek seeds are a potential source of diosogenin, a basic compound in the semi-synthesis of steroid drugs such as cortisone and sex hormones.(0.5 mark)
- 5- Ouabain is used as a biological standard for assay of cardiotonic drugs because this drug is polar, water soluble, potent, rapidly absorbed and eliminated crystalline (0.75 mark)
- 6-Nutmeg-ethanol interaction as it has hallucinogenic effect (0.5 mark)

Question 2: Suggest the appropriate term (words) used to indicate each of the following:
 (1.5 marks/0.25 mark each)

- 1- Amphitropous
- 2- The chalaza
- 3- Plumule
- 4-Castor seed
- 5- Calabar beans
- 6-Pumpkin seed

Question 3: (12 marks)

Identify each of the following figures and their labels (whenever stated) (2.75 marks/0.25 marks each), then answer the given cases. (9.25 marks)

- a-1- closely appressed hair with 10 strongly thick, lignified longitudinal internal ribs.
- 2- Epidermis: formed of lignified, thick walled cells with sinuous polygonal outline.
- b- Mat like structure (linseed).
- c-1- Hypodermis (Giant cells).
- 2- Sclereids of unequal height and thickening.
- d- Accumbent embryo.
- e- Cardamom seed.
- f- Palisade like epidermal cells.(Foenugreek)
- g- Numerous fragment of yellowish to reddish-brown to dark brown sclereids.
- h-Straight embryo (linseed).
- i- - Fragments from testa showing the elongated cells of epidermis with hairs (Strophanthus).

Case 1: (1.75 marks)

- 1- Immunodeficiency (0.5 mark)
- 2- Nigella seed (0.25 mark)
- 3- Volatile oil (1.4 %)Thymoquinone, Carvone , Fixed oil *Unsaturated fatty acids [Oleic acid , Linoleic acid, Linolenic acid, Stearic acid]*Saturated fatty acids [Myristic acid , Palmitic acid]. Protein ,Vitamins (B 1,2,6) Minerals (Ca , Fe , Zn , Cu) (0.5 mark)
- 4-Sudan III (0.25 mark)
- 5- Black seed. (0.25 mark)

Case 2: (2 marks)

- 1- Cardamom.

Volatile oil. The oil contains a high percent of terpinyl acetate and cineole and smaller quantities of other monoterpenes, including alcohols and esters (0.75 mark)

- 2-(e&g). (0.5 mark)

3- 1- To avoid loss of volatile oils. The loss of oil from seeds kept in the pericarp is small but a loss of 30% in 8 months takes place when the seeds are separated from the fruits.

- 2- To protect against insect attack

3- To differentiate between commercial varieties. (0.75 marks)

Case 3: (2.5 marks)

- 1- Nux vomica seed (0.25 mark)
- 2- Indole alkaloids, strychnine & brucine (1.8-5.3 %) (0.75 mark)
- 3- There is no specific antidote for strychnine. "The convulsions are often triggered by stimuli – when your body senses something, neurons want to fire, and if they aren't controlled seizures occur – so patients are generally kept in quiet, dark rooms." [Treatment of strychnine poisoning involves an oral application of an activated charcoal infusion which serves to absorb any poison within the digestive tract that has not yet been absorbed into the blood. Anticonvulsants such as phenobarbital or diazepam are administered to control convulsions, along with muscle relaxants such as dantrolene to combat muscle rigidity. If the patient survives past 24 hours, recovery is probable. (0.5 mark)
- 4- In large doses, it causes violent convulsions and these involve the respiratory muscles and death results from asphyxiation. (0.5 mark)
- 5- Mount a little of powdered Nux vomica in nitric acid, an orange red colour is produced (Brucine)
Mount a little of powdered Nux vomica in Mandelin's reagent (Ammonium metavanadate + H₂SO₄); a pinkish to violet colour is produced (Strychnine) (0.5 mark)

Case 4: (3 marks)

- 1- The differential diagnosis is more inclined towards rheumatologic conditions (0.25 mark)
- 2- Linseed. (0.25 mark)
- 3- b & h. (0.5 mark)
- 4- Omega-3 fatty acids have demonstrated effect due to reduced production of inflammatory mediators (0.75 mark)
- 5- When taken internally, Linseed must be accompanied by plenty of fluids, otherwise flatulence may occur. (0.5 mark)
- 6- 1-General test for cyanogenic glycoside (Guignard's paper test): (filter paper moistened with aqueous solution of picric acid, then allowed to dry and dipped in aqueous solution of sodium bicarbonate and dried).
- Linamarin glycosides (0.75 marks)

Question 4: You are provided with 6 sentences in each one choose the odd word that coordinates with the corresponding mentioned parameter. (1.5 marks/0.25 mark each)

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|---|----------------------------|
| 1-Linseed- <u>cardamom</u> - Black mustard | (Glycosides) |
| 2- Black mustard -Nux vomica- <u>Foenugreek</u> | (Sclerides) |
| 3- Psyllium- <u>white mustard</u> -Pumpkin seed | (Diabetes) |
| 4- Linseed-Colchicum- <u>Nux vomica</u> | (Raphe) |
| 5- <u>Testa</u> -Endosperm-Embryo | (kernal) |
| 6- Nux vomica- <u>Calabar beans</u> -Colchicum | (Hemicellulosic endosperm) |

End of questions