



October University for Modern Sciences & Arts Final Exam MODEL ANSWER

Faculty	Pharmacy
Department	Pharmacognosy
Module Code	PHG112 (Year 1)
Module Title	Pharmacognosy
Semester	Spring 2026
Date	13/06/2026
Time Allowed	2 hours
Total Mark	60 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

60 Marks

Question 1:

(18 marks, 1 mark each)

Choose the correct answer:

1. Plants that live more than two years are known as.....
a. Annual b. Herbs c. Evergreen **d. Perennial** e. Biennial
2.enzyme that is found in unripe papaya fruit and latex aids digestion and cleanses the digestive tract.
a. **Papain** b. Bromelain c. Lipase d. Amylase e. Pepsin
3. herb is traditionally used for bronchitis, whooping cough and upper respiratory tract infections.
a. Rosemary b. Sweet basil c. Peppermint **d. Thyme** e. Artemisia
4. The dried rhizome and big roots of Rhubarb contain very large cluster crystals of.....
a. Calcium carbonate **b. Calcium oxalate** c. Silica d. Starch e. Cystolith
5.is one of the major components of commercial pancreatin
a. Pepsin **b. Trypsin** c. Thyroxin d. Insulin e. Leptin
6. Ergot is the sclerotium of *Claviceps purpurea* that develops on rye, the hallucinogenic drug that is derived from ergot alkaloids is known as.....
a. MDMA b. Psilocybin **c. LSD** d. Mescaline e. DMT
7.is a mineral present in lychee fruit that acts as a vasodilator and helps control blood pressure?
a. Calcium b. Iron **c. Potassium** d. Sodium e. Zinc
8. Potato is said to have cosmeceutical effects including prevention of aging. Most of the nutrients in a potato are found in its.....
a. Flesh b. Skin c. Sprout d. Core **e. Juice**
9.is used as a marker to identify opium.
a. Meconic acid b. Codeine c. Cystolith d. Calcium carbonate e. Morphine
10. Vitamin K deficiency-related bleeding (VKDB) could be treated by including.....in the diet
a. Lychee fruits b. **Avocado fruits** c. Wheat germ oil d. Papaya fruits e. Lemons
11. Capsicum fruits are red colored due to the presence of.....
a. Capsaicinoids b. **Carotenoids** c. Fixed oil d. Capsicosides e. Capsaicin
12. Rosemary herb has been shown to enhance memory and concentration,is a major component of its volatile oil.
a. 1,8-Cineole b. Artemisia ketone c. Menthone d. Carvacrol e. Thymol

13. An herb is defined as a drug composed usually of
a. Only the leaves b. Only the flowers **c. The stem, leaves, flowers and fruits**
d. Only the underground parts e. Only the seeds
14. is the mature fertilized ovule that contains an embryo.
a. Fruit b. Subterranean c. Flower **d. Seed** e. Carpel
15. An example of a fruit with dry pericarp is.....
a. Orange b. Peach **c. Walnut** d. Capsicum e. Mango
16. seeds can be beneficial for symptoms related to hormonal imbalances such as Premenstrual Syndrome (PMS) and menopausal symptoms.
a. Nigella b. Calabar c. Castor **d. Evening primrose** e. Pumpkin
17. If you mount a section of *Strophanthus kombe* in sulphuric acid (66 % v/v), its endosperm will acquire a.....color.
a. Green b. Purple c. Red d. Reddish brown e. Brick red
18. compound is responsible for the taste and smell of anise fruits.
a. Methyl chavicol **b. Trans- anethole** c. Anisaldehyde d. Anisic acid e. Coniine

Question 2:

(20 marks, 2 marks each)

Answer only TEN of the following questions:

a- Lychee fruits have demonstrated profound antiviral activity. Rationalize.

Litchitannin A2 has been closely connected to preventing the spread or outbreak of viruses, including herpes simplex virus and coxsackievirus.

b- *Rheum rhaponticum* is considered an unofficial species of rhubarb. Justify.

Because it contains rhaponticin glycoside that may cause :

- **Gastrointestinal symptoms: Diarrhea, nausea, cramps, abdominal pain, bloating.**
- **Symptoms of the nervous system: Headache**
- **Hypersensitivity/rash: Rash, itching, skin irritation**

c- Distinguish between the short-term and long-term side effects of using cannabis.

- **Short term side effects: Decrease in short-term memory, dry mouth, impaired motor skills, red eyes and feelings of paranoia or anxiety**
- **Long term side effects: Addiction, decreased mental ability in those who started as teenagers, and behavioral problems in children whose mothers' used cannabis during pregnancy.**

d- Discuss the side effects and contraindications of using capsicum.

Side effects

- **Allergic reaction to the cream, so the first application should be to a very small area of skin.**
- **Oral intake can cause burning in the mouth and throat, also, it can cause the nose to run and eyes to water.**

People with ulcers, heartburn, or gastritis should use any cayenne-containing product cautiously as it may worsen their condition.

- **Contraindications: Application on injured skin, allergies to cayenne preparations**

e- Cochineal is an entire drug from female insects, point out its active constituents and uses.

Active constituent: red colouring matter, carminic acid

Uses: colouring matter for tooth-pastes and tinctures

f- Discuss the contraindications of using ashwaganda.

Hypersensitivity to the active substances and to other plants of the same family.

Due to its immunomodulatory effects, it has been suggested that Ashwagandha should be avoided in autoimmune diseases such as lupus and multiple sclerosis .

g- Contrast the pharmacological actions and uses of ergometrine and ergotamine.

1- Ergometrine alkaloid:

- **Oxytocic: It stimulates the uterus → initiate delivery (labor)**
- **It reduces postpartum hemorrhage**

2- Ergotamine alkaloid:

- **Vasoconstrictor, used for the treatment of migraine.**
- **Used in combination with caffeine to treat headaches.**

h- Mentha and thyme powders are very similar to each other via microscopical examination.

Mention a key element that is present in both powders and a specific key element that is unique to each of them.

Key element that is present in both powders: Labiate hair

Specific key element for mentha: Non glandular hair

Specific key element for thyme: Bent hair

i- Resins are considered a class of unorganized drugs. Point out one example mentioning its active constituents (only 2).

Myrrh: 1- 1.5-17% volatile oil composed of limonene, pinene, cinnamaldehyde & cadinene.

2- Resin consists mainly of α- and β- commiphoric acid and commiphoric acid

3- 60% gum

OR

Frankincense: Acid resin (6%), soluble in alcohol, Gum (similar to gum arabic), α-boswellic acid , olibanic acid, Volatile oils

j- Due to the diversity of samples, there are three different methods to detect cannabis. Comment.

Microscopical examination of powder: Powder+ HCl produces eff. due to calcium carbonate in cystolith.

Chemical test on the powder: Beam's test: Cannabis shaken with light petrol and alc. KOH and amyl alcohol give violet pink colour

Biological sample: Fast blue test: Different sequences of colors with different cannabinoids

k- Sweet basil (Ocimum) herb has diverse pharmacological actions. Mention 4 different examples of its actions.

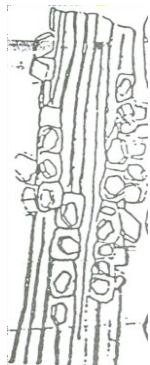
- **Antiviral activity toward SARS-CoV-2 due to its monoterpenes and flavonoids**
- **Antibacterial**
- **Leaf extract administered orally had the potential to improve neuromuscular coordination, active behavior, the ability to recognize objects, and enhance short-term memory**

- A great wound healing ability
- Antiinflammatory effect
- Combat anxiety, depression and insomnia
- Aid in weight loss.

Question 3:

(10 marks)

The following are key elements of an herbal tea bag composed of a mixture of crude drugs:



a



b

a- Identify the 2 drugs (2 marks)

a: Liquorice b:Ginger

b- Recognize each key element (1 mark)

a- Crystal Sheath b. Staminate starch

c- Suggest one major use of this herbal tea bag (1 mark)

Antiinflammatory

d- Recommend one more drug that could be added to this mixture (1 mark)

Turmeric

e- Mention two major active constituents for each drug (2 marks)

Liquorice: 1- Sweet principle glycyrrhizin (triterpenoid saponin)

2- Flavonoids, liquiritin, isoliquirtin

3- Coumarins (licoumarin) & bitter principle (glycyramarin)

4- Volatile oils

5- Starch, sugar , β- sitosterol and protein

6- Asparagine (amide of aspartic acid)

Ginger: 1- Volatile oil mainly Zingiberene, bisabolene and farnesene

2- Gingerol and shogaols (responsible for pungent taste)

3- Resin and starch

f- It is preferable to do a modification to drug A prior to its use, mention the modification and rationalize it. (1 mark)

Deglycyrrhizinated licorice, or DGL, is an herbal supplement typically used in the treatment of gastric and duodenal ulcers.

It is made from licorice from which the glycyrrhizin has been removed.

Glycyrrhizin is known to cause negative side effects, such as hypertension and edema; removing the glycyrrhizin is meant to avoid these symptoms

g- How can you confirm the presence of drug A using a chemical test? (1 mark)

1-Froth test: Powder + Water, in a test tube and shake well, Persistent froth stable for more than 1 min. (saponin) OR 2- Powder +66% H₂SO₄ gives orange red colour

h- Justify the pungency of drug B and how can you destroy it? (1 mark)

Its pungency is due to Gingerol and shogaols and it is destroyed by boiling with KOH solution

Question 4:

(12 marks, 4 marks each)

Read carefully the following cases and answer the corresponding questions

A- A 22-year-old fashion model, with extremely long honey-brown hair, was promoting an anti-acne serum. Unfortunately, during a mid-day beach photo session, she got sunburned. She visits a pharmacy looking for natural products to relieve her sunburn.

1- What cosmeceutical do you think she is regularly adding to her hair care routine to get her long hair? **(Rosemary)**

2- Concerning the anti-acne product that she was promoting, suggest 2 different crude drugs that could be included in the formula. **(Frankincense – Lemon – Liquorice)**

3- From your opinion, what crude drug should be included in the product applied to treat her sunburn. **(Aloe- Lemon- Liquorice)**

4- As a model, she needs to keep her figure up to the international standards, recommend her a nutraceutical that she can include in her dieting plan for weight loss. **(Lemon- Sweet basil- gelatin)**

B- A 63-year-old farmer with type 2 diabetes, has a chronic non-healing wound on his foot due to his diabetic disorder. As a result of physical labor, he also suffers from osteoarthritis in his knees and bronchial asthma that resulted from the dust and hay that he is constantly subjected to.

1- Recommend a cheap nutraceutical that he can add to his diet to improve his diabetes.

(Rosemary-Onion)

2- Predict an affordable crude drug that he can use for treatment of osteoarthritis. Justify your answer. **(Gelatin)**

3- Formulate a mixture of 2 crude drugs (from 2 different origins) that he can apply to his wound to improve the healing process? **(Aloe- Artemisia- Sweet basil- Potato)**

4- Suggest a crude drug that could help him improve his asthma case and rationalize your suggestion. **(Lobelia- due to the presence of lobeline alkaloid)**

C- A 32-year-old exhibitionist that travels frequently to tropical regions recently got traumatized after he got bitten by a huge crocodile. He miraculously survived the attack but suffered extreme pain by the time he reached the emergency room. Afterwards, he continues to have difficulty sleeping (insomnia), suffers from nightmares and notices that his hair is falling out.

1- For exhibitionists, what would you recommend as a malaria preventive and why? **Artemisia due to the presence of Artemisinin**

2- Based on your studies, what analgesia should be given to him at the emergency room? And would you prefer to use it as a crude drug or a natural product? Justify your answer. **Opium- Natural Product- because it includes more than 25 alkaloids while we just need morphine for the analgesic effect.**

3- Suggest him a crude drug that could be employed as a stress relief and sleeping aid? Mention its active constituents (2 only) **Ashwaghdha- Steroidal lactones: Withanolides (as withaferin A, B, D) - Alkaloids : Withanine, somniferine**

4- Recommend a natural treatment for his hair fall. **(Rosemary-Onion-liquorice-knotweed)**

----- - End of questions