PHILADELPHIA UNIVERSITY

Faculty of Pharmacy

Pharmacognosy and Phytochemistry – Second Exam

Instructor:

Dr. Yousef Abusamra

Name: _____ **Student No.:** _____

Date: 19/5/2016 **Section- الشعبة ( )** **Time: 3:00 – 3:50**

Answer / Question	A	B	C	D	E
1					
2					
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- This exam contains *5* pages including this very page containing the answer sheet and information about the examinee.
- The exam is contains 2 questions:
  1. Multiple-choice accounting for 20 marks.
  2. Assay question, accounting for 15 marks.

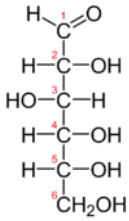
- Try to answer all questions.
- Write your answers clearly.
- Answers of multiple-choice part must be transferred to the answer sheet.

❖ Total mark scored: /35
/20

I. Encircle the most correct answer in the following questions (1-20) {20 marks}:

1. All the followings are true except:

a) In Fischer projection, the D and L-prefixes specify the configuration of the hydroxyl group at C-3.
b) Fischer projection is a way to draw the skeletal formula of monosaccharides in an acyclic form.
c) In Fischer projection of glucose, one isomer has the C-3 hydroxyl group on the left, and the one on C-4 and C-5 hydroxyls are on the right.
d) Haworth projection includes a 3-dimentional design in writing the monosaccharides formulas.
e) B+C.



2. Given the following drawing of glucose in Fischer projection, when converting it into Haworth projection, carbon number…… will be the anomeric carbon:

a) Carbon number 3.
b) Carbon number 4.
c) Carbon number 1.
d) Carbon number 5.
e) Carbon number 2.

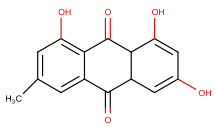
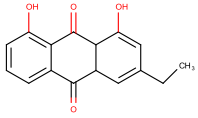
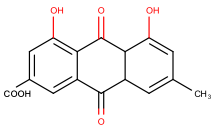
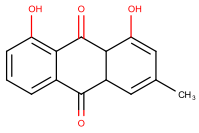
3. All the followings are false except:

a) Emulsin cannot differentiate between the α- and β-glycosides, but acid can.
b) In acetals, the chiral carbon must be bound to at least two oxygen atoms.
c) In glycosides, genins often share the sugar moieties the pharmacological effect.
d) In Fischer projection, D-sugar has the hydroxyl of C-3 on the right.

4. The difference between anthrone and anthranol is:

a) Anthrone is more reduced on C-10.
b) Anthrone is more reduced on C-9.
c) Anthranol has a hydroxyl group on C-10.
d) Anthrone has a carbonyl group on C-10.

5. Find the chemical structure of chrysophanol?

a) 
b) 
c) 
d) 

6. Storage of the crude drug with a strong activity is important to:

a) To oxidize the reduced forms of anthraquinones.
b) To reduce anthrones back to 9,10-anthraquinones.
c) To convert anthranols to anthrones.
d) To oxidize dianthrones to anthrones.

7. The false statement among the followings is:

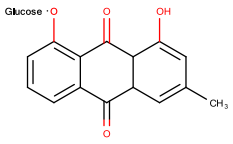
a) *Cascara purshiana* belongs to the Rhamnaceae.
b) It should be aged for about one year prior to using.
c) The used part is the bark.
d) The genin of the O-glycosides is emodin.
e) Cascaroside A is not a dianthrone

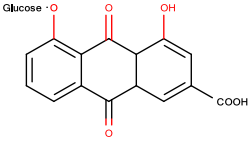
8. The used part of *Rheum officinale* is:

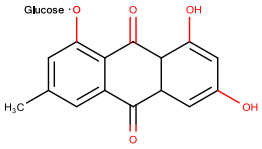
a) The leaf.

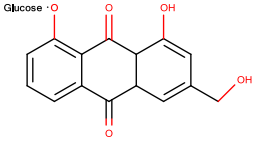
b) The root.
c) The bark.
d) The Arial parts with flowers.

9. The main anthraquinone glycoside of Rhubarb has the followings structure:

a) 

b) 

c) 

d) 

10. Which species has Cape aloe as its common name?

a) Aloe barbadensis.
b) Aloe vera.
c) Aloe perryi.
d) Aloe ferox.
e) Aloe purshiana.

11. Sennoside C:

a) Is a dianthrone with the genin is aloe-emodin.
b) Is a heterodianthrones with the genins are rhein and emodin.
c) Is a dianthrone with the genin rhein.
d) Is a heterodianthrone with the genins are rhein and aloe-emodin.
e) Is a mixture of a dianthrone and a heterodianthrones.

12. An important drug-drug interaction between anthraquinones and digitalis glycosides can be serious, this is because:

a) Anthraquinones can increase digitalis glycosides blood levels.
b) Anthraquinones inhibit the cytochrome p-450 enzymes in the liver that digest digoxin.
c) Hypokalemia can result upon the use of anthraquinones.
d) Anthraquinones can inhibit the intestinal motility.
e) An increase in Ca^{++} ions by anthraquinones increases the toxicity of the cardiac drugs.

13. Cardiac glycosides do all the followings except:

a) Increase excitability of the heart.
b) Decrease blood volume pumped to all over the body as they have a diuretic effect.
c) Have a positive inotropic effect.
d) Decrease number of heart beats.
e) Decrease the length of the cardiac muscle fibers, thus almost restoring their size.

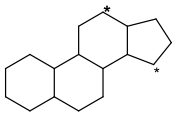
14. The basic steroidal structure of cardiac glycosides can be expressed as: cyclopentano perhydrophenanthrene, perhydro means:

a) Ring D is saturated.
b) The three rings A, B and C can be synthesized using perchloric acid as an oxidizing agent.
c) Rings A, B and C are fully hydrogenated.
d) Ring A has an unsaturation.

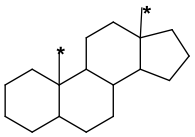
15. A cardiac glycoside as a bufadienolide exists in:

a) *Nerium oleander.*
b) *Digitalis lanata.*
c) *Urginea maritima.*
d) *Strophanthus gratus.*

16. If you know that the carbons marked with a star (*) have a hydroxyl with a β-orientation, decide which structure fulfills the requirements of a cardiac glycoside?



a)



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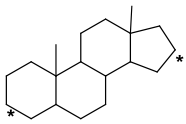

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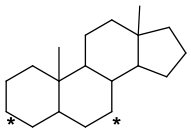

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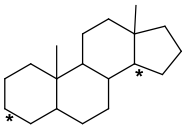


e)

17. All the followings are true except:

a) Gitoxin is equivalent in activity to digitoxin after i.v administration.
b) Hypercalcemia is one of the reasons of digitalis toxicity.
c) $T_{1/2}$ is the longest for digitoxin (longest time is needed by the body to clear digigitoxin).
d) In case of renal insufficiency, digoxin can be recommended.
e) Digitalis toxicity can result in arrhythmia.

18. What is the secondary metabolite obtained after the hydrolysis of K-strophanthoside by removing the <u>two</u> terminal sugar moieties?

a) Cymarose.
b) Cymarine.
c) Strophanthidin.
d) K-strophanthidin-β.

19. Ouabain is the main active cardiac glycoside obtained from:

a) *Strophanthus kombe.*
b) *Nerium oleander.*
c) *Urginea indica.*
d) *Urginea maritima.*
e) *Strophanthus gratus.*

20. ..... is used as a rodenticide:

a) K-strophanthoside.
b) G-strophanthin.
c) Indian squill.
d) Oleandrin.

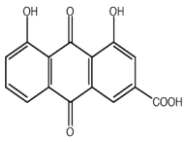
II. Answer the following questions: [15 marks]:

1. What is the importance of the sugar moiety in glycosides?

2. Explain the mechanism of action of anthraquinones, and why should not they be used as first-choice laxatives?

a. Mechanism of action of anthraquinones:

b. Why they are not considered first-choice laxatives:

3. This structure 

is ..... .

4. *Cascara sagrada* belongs to the family..... .

5. What is the reason behind storing laxative plant materials for about one year prior to use?

6. The scientific name of rhubarb is ..... .

7. Exemplify for the first-choice laxative? .....

8. In cardiac glycosides, the lactone ring occurs on carbon number ..... .

9. Gitoxin occurs in which plant species? ..... .

10. Explain, in few words, how digoxin differs from digitoxin when talking about the chemical structure?

11. By removal of the terminal glucose moiety and deacetylation of the third digitoxose sugar moiety, it is possible to convert lanatoside C to .....

12. What does the positive inotropic effect of cardiac glycosides mean?

13. ..... contains ouabain, and this plant belongs to the family ..... .

Good Luck