



FACULTY OF PHARMACY

Pharmacognosy and Phytochemistry Final Exam

LECTURER:

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Name:

Student No.:

Section Time (وقت الشعبة)

Duration: 11:00 – 13:00

Day and date: Monday 13.6.2016 ----- Total number of pages = 8. Total mark=60.

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Question 1: Multiple choice (35 marks)

	A	B	C	D	E		A	B	C	D	E
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18											

Question 2: (True) or (False) ----- (13 marks)

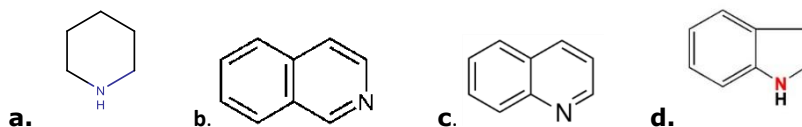
1	2	3	4	5	6	7	8	9	10	11	12	13
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F	F	F	F	F	F	F	F	F	F	F	F	F

Question 3: Matching (15 marks)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

QUESTION I: CHOOSE THE MOST CORRECT ANSWER IN EACH OF THE FOLLOWING QUESTIONS? [28 marks]:

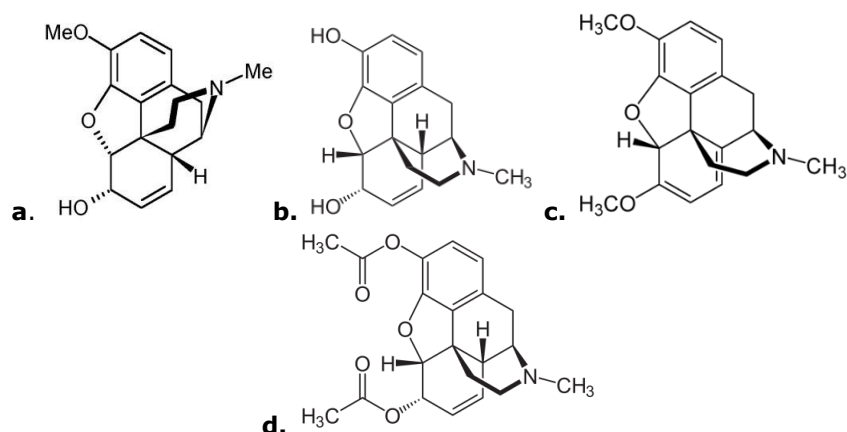
1. Opium alkaloids are classified according to which base among the followings?:



2. All the followings concerning papaverine are CORRECT EXCEPT:

- It is a muscle a muscle-relaxant.
- It is not a morphinan alkaloid.
- Used to increase blood perfusion to tissues.
- Can be used as anti-arrhythmic.
- It is a strong narcotic drug from opium *Papaver somniferum*.

3. This alkaloid is NOT used therapeutically, but is industrially converted to other drugs like: oxycodone, oxymorphone and naltrexone:



4. *Cephaelis ipecacuhana* contains alkaloids that can mainly be used as:

- Anti-catarrhal.
- Anti-cancer.
- Against dyspepsia.
- Spasmolytic.
- Emetic.

5. A plant that can be used to control uterine hemorrhage most probably is:

- Papaver somniferum*.
- Nicotiana tobaccum*.
- Punica granatum*.
- Hydrastis canadensis*.
- Lobelia inflata*.

6. A plant containing a bis-benzylisoquinoline alkaloid which is a nicotinic receptor antagonist most possibly is:

- a. *Chondrodendrum tomentosum*.
- b. *Ricinus communis*.
- c. *Holiotropium indicum*.
- d. *Cytisus scoparius*.

7. In the biosynthesis of opium alkaloids, phenolic oxidative coupling converts reticuline to:

- a. Codeine.
- b. Thebaine.
- c. Nor-landanosoline.
- d. Morphine.

8. All the followings are pharmacological effects of narcotics (e.g. morphine) except:

- a. Analgesia
- b. Tachycardia.
- c. Sedation.
- d. Constipation

9. Heroin is a biosynthetic opium alkaloid, it can be produced from morphine by:

- a. Methylation.
- b. Oxidative phenolic coupling.
- c. Diacetylation.
- d. Demethylation.

10. Apomorphine is used as to treat intoxication.

- a. Anti-tussive.
- b. Muscle relaxant.
- c. Sedative hypnotic.
- d. Constipative.
- e. Emetic.

11. is a synthetic opiate drug, that is used in rehabilitation programs for addict patients:

- a. Fentanyl.
- b. Pethidine.
- c. Tramadol.
- d. Methadone.

12. In the biosynthetic pathway of nicotine, the conversion of N-methylornithine to N-methylputrescine is done by :

- a. Transamination.
- b. Decarboxylation.
- c. Methylation.
- d. Hydroxylation.

13. Arecoline is toxic to worms, which alkaloid among the followings has similar activity?

- a. Lobeline.
- b. Coniine.
- c. Pelletierine.
- d. Ricinine.

14. An alkaloid that attenuates the oxidative defense and can induce apoptotic death is:

- a. Arecoline.
- b. Pelletierine.
- c. Ricinin.
- d. Anagyrine.

15. "Crooked calf disease" can be caused by which pair of alkaloids?

- a. Coniine and sparteine.
- b. Coniine and ricinine.
- c. Anagyrine and ricinine.
- d. Anagyrine and coniine.
- e. Ricinine and sparteine.

16. "Hemlock" is the common name of:

- a. *Hyoscyamus muticum*.
- b. *Rauwolfia serpentina*.
- c. *Lupinus luteus*.
- d. *Conium maculatum*.

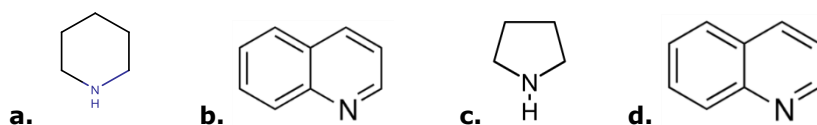
17. Death following coniine toxic effect directly occurs as a result of:

- a. Cardiovascular toxicity.
- b. Anti-cholinergic effect.
- c. Respiratory paralysis.
- d. Hypertensive crisis due to increase in epinephrine.

18. Ricinine is a alkaloid.

- a. Piperidine.
- b. Bis-benzylisoquinoline.
- c. Bis-indole.
- d. Tetrahydroisoquinoline.
- e. Pyridone.

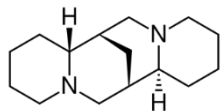
19. *Lupinus luteus* is well-known for containing an alkaloid with the following base in its structure:



20. One of the following alkaloids has a clear structure similarity with nicotine, it is:

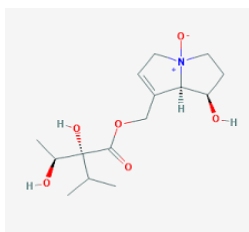
- a. Cytisine.
- b. Ergometrine.
- c. Vincristine.
- d. Thebaine.

21. An alkaloid with the structure shown below can be used in the treatment of



cardiac insufficiency :

- a. Anagyrine.
- b. Cinchonidine.
- c. Sparteine.
- d. Camptothecine.



22. The alkaloid with this structure is taken from:

- a. *Lupinus luteus*.
- b. *Cytisus scoparius*.
- c. *Stachys tuberifera*.
- d. *Holiotropium indicum*.

23. Cattle disease is caused by which group of alkaloids?

- a. Piperidine alkaloids.
- b. Pyrrolizidine alkaloids.
- c. Quinolizidine alkaloids.
- d. Indole alkaloids.

24. All the following genera contain indole alkaloids EXCEPT:

- a. *Physostigma*.
- b. *Strychnos*.
- c. *Vinca*.
- d. *Senecio*.

25. Which species is responsible for causing ergotism?

- a. *Strychnos nux vomica*.
- b. *Ruwolfia serpentina*.
- c. *Claviceps purpurea*.
- d. *Ricinus communis*.

26. Lysergic acid ethylamide is famous to have:

- a. Ergotism effect.
- b. Cinchonism effect.
- c. Psychic effect.
- d. Cholinergic effect.

27. Ergot alkaloids are remarkable for their use as:

- a. Anti-arrhythmic.
- b. Expectorant.
- c. Anti-migraine.
- d. Anti-hypertensive.

28. The botanical source of vinca alkaloids is the plant species:

- a. *Physostigma venenosum*
- b. *Taxus brevifolia*.
- c. *Catharanthus roseus*.
- d. *Rauwolfia serpentina*.

29. The mechanism of action of vinca alkaloids is proposed to include:

- a. Inhibition of disassembly of microtubules.
- b. Inhibition of polymerization of microtubules.
- c. Blockage of the mitochondria.
- d. Encouragement of tubulin dimers depolymerization.
- e. A+C.

30. All the followings concerning vinca alkaloids are TRUE EXCEPT:

- a. They are obtained from Madagascar periwinkle.
- b. They are used to treat leukemia, Hodgkin's disease and lymphomas.
- c. The alkaloids are naturally abundant in the plant leaves.
- d. Examples of them are Vinorelbine and Vincristine.

31. The mechanism of action of paclitaxel is almost exactly the opposite of the mechanism of action of:

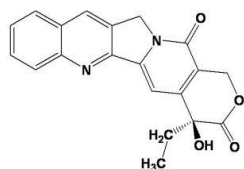
- a. Camptothecin.
- b. Vinorelbine.
- c. Reserpine.
- d. Neostigmine.
- e.

32. *Taxus baccata*:

- a. Is used as an anti-hypertensive plant.
- b. Is a good source of camptothecin alkaloid.
- c. Contains valuable amounts of an alkaloid that is converted to taxol in the lab.
- d. Contains only small amounts of the anti-cancerous alkaloid 10-deacetylbaccatin III.

33. An alkaloid that is used to treat and diagnose myasthenia gravis is:

- a. Strychnine.
- b. *d*-tubocurarine.
- c. Reserpine.
- d. Docetaxel.
- e. Neostigmine.



34. This drug has the following pharmacological effect:

- a. Expectorant.
- b. Anti-protozoal.
- c. Anthelmintic.
- d. Anti-cancerous.
- e. Anti-diarrheal.

35. Irinotecan mechanism of action includes:

- a. Prevents unwinding of the DNA strand.
- b. Stimulates topoisomerase I enzyme which is responsible of DNA strand winding.
- c. Prevents protein synthesis in the cancer cell.
- d. Inhibits depolymerization of tubulin.

QUESTION II. DECIDE IF EACH OF THE FOLLOWING STATEMENTS IS (TRUE) OR (FALSE):

- 1) 10-aminocamptothecin derivatives like belotecan and irinotecan are synthetic analogues and more water-soluble.
- 2) A protoalkaloid is a simple amine where the nitrogen atom exists outside the ring/s.
- 3) 4° alkaloid is extracted using a polar solvent.
- 4) Chromophores are functional groups that can be identified using UV spectroscopy measuring the number of electrons making the bonds.
- 5) *Hyoscyamus muticus* is a solanaceous plant rich in tropane alkaloids.
- 6) Hyoscyamine is an ester of *l*-tropic acid and scopolamine base.
- 7) The difference between scopolamine base and tropine base is that scopolamine contains an additional methyl group in its structure.
- 8) Atropine can be used as an antidote to poisoning with organophosphorus insecticides.
- 9) Because of its sedative effect, scopolamine is contraindicated in patients with motion sickness.
- 10) Cocaine is a diamide alkaloid that is easily hydrolyzed.
- 11) The difference between quinine and cinchonine is that quinine has an additional hydroxyl group in its chemical structure with β -orientation.
- 12) In the biosynthesis of cinchona alkaloids, ring closure to form the quinoline ring occurs first in cinchonidinone.

13) Quinidine is an anti-arrhythmic drug.

QUESTION III: MATCH THE CORRECT ANSWER FROM THE OPPOSITE COLUMN AND PUT THE ANSWER AS A letter IN THE ANSWER SHEET:

1	Cholinesterase irreversible inhibitor Physostigmine D	A	Noscapine
2	An alkaloid used to treat solid tumors Paclitaxel M	B	Quinine
3	An alkaloid from pomegranate with vermifugal activity Pelletierine J	C	Hygrine
4	An alkaloid used to treat uterine hemorrhage with indole structure (base) Ergometrine G	D	Physostigmine
5	An opium alkaloid without analgesic activity used as anti-tussive Noscapine A	E	Vincristine
6	An alkaloid used to counteract strychnine poisoning Curare L	F	Pilocarpine
7	A quinolizidine alkaloid, tetracyclic, oxytocic effect Sparteine O	G	Ergometrine
8	An alkaloid from blood root used for atonic dyspepsia with hepatic symptoms Sanguinarine K	H	Echinatine
9	An alkaloid that can cause tinnitus as a side effect Quinine B	I	Ricinine
10	Precursor of nicotine Ornithine N	J	Pelletierine
11	A promising cognition-enhancing alkaloid Ricinine I	K	Sanguinarine
12	An alkaloid with a pyrrolidine base in its structure, used to overcome fatigue Hygrine C	L	Curare
13	A monoester pyrrolizidine alkaloid Echinatine H	M	Paclitaxel
14	An imidazole alkaloid used to treat glaucoma Pilocarpine F	N	Ornithine
15	Anti-cancer bisindole alkaloid Vincristine E	O	Sparteine