



امتحان نظري
2015-2016

	TANTA UNIVERSITY FACULTY OF PHARMACY DEPARTMENT OF PHARMACOGNOSY				
	FINAL EXAM FOR SECOND YEAR STUDENTS				
	COURSE TITLE:	Chemistry of Crude Drugs		COURSE CODE: 3055	
DATE:	3 /1/ 2016	TERM: FIRST	TOTAL ASSESSMENT MARKS: 250	TIME ALLOWED: 2 HOURS	

PART I: Alkaloids

Question A ,B, C

1A-Draw the chemical structure and name the following :

80 points 40 min

30 points 15 min

1a-An antitumor alkaloid with carbazole ring system

2a-An alkaloid, which produces polyploidy in plants

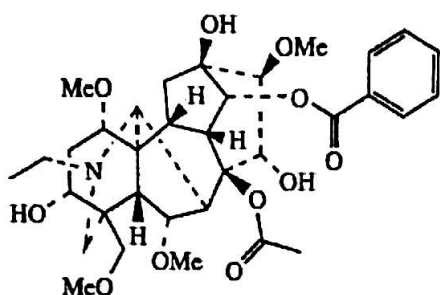
3a-A simple benzyloquinoline alkaloid with aromatic heterocyclic ring

4a-A sesquiterpene alkaloid with quinolizidine ring

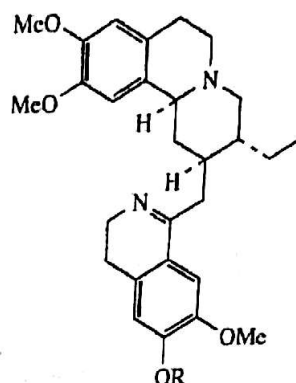
5a-Polyhydroxylated inolizidine alkaloid, which can affect proliferation of AIDS virus

6a-An ergoline alkaloid used as oxytocic

1B: Identify the names of the following structures, give also the chemical and biosynthetic classes whenever applicable. Answers should be listed in Table I: (32 points, 15 min)

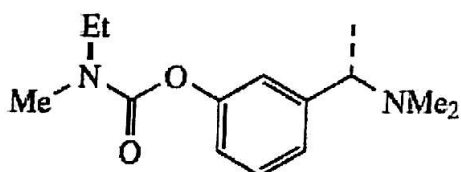


(1b)

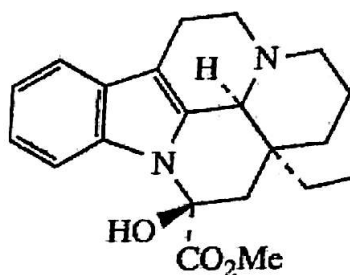


$R = \text{Me}$

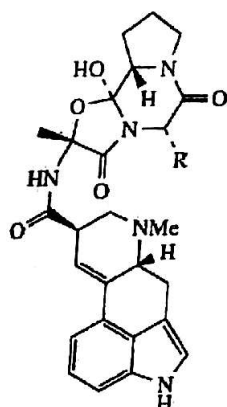
(2b)



(3b)

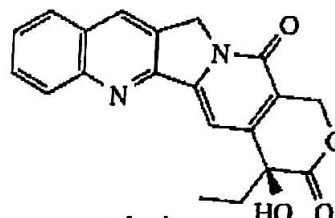


(4b)

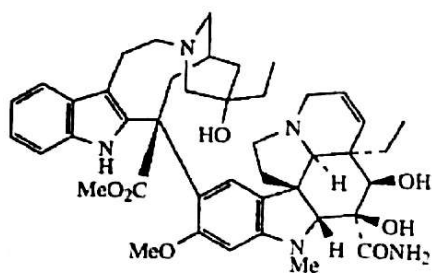


$R = \text{CH}_2\text{Ph}$

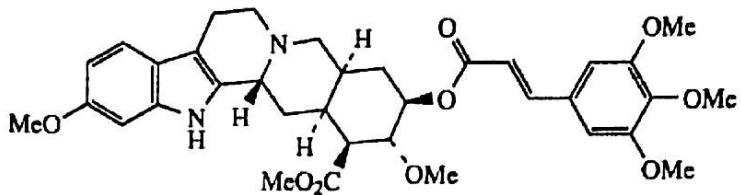
(5b)



(6b)



(7b)



(8b)

Table (I)

No.	Name	Chemical class	Biosynthetic class
1b			
2b			
3b			
4b			
5b			
6b			
7b			
8b			

1C- Match the number of the following statements with a correct answer in table II by writing the number of the statement in front of the correct answer:
(18 points, 10 min)

- 1-The botanical source and a biological effect of alkaloid 1b.
- 2-A chemical test used to differentiate alkaloid 8b from other related alkaloids in the same plant.
- 3-Mechanism of therapeutic action of alkaloid 1a.
- 4-A therapeutic application of alkaloid 2a.
- 5-Biological effect and mechanism of action of alkaloid 2b.
- 6-A therapeutic use and a contraindication of alkaloid 4b.
- 7- A chemical test used also in colorimetric assay of alkaloid 5b
- 8-A method for quantitative assay of alkaloid 5a.
- 9-Synthetic analogues of compound 6b.
- 10-Separation of a mixture of morphine and narceine.
- 11-An alkaloid derived from amino acid histidine.
- 12Therapeutic use of alkaloid 7b.
- 13-Separation of a mixture caffeine and theophylline
- 14-structural features needed for activity of drug 3b.
- 15-A therapeutic use of alkaloid 4a.
- 16-Colorimetric assay of alkaloid 2a
- 17-A C-nor, D-homosteroidal alkaloid.
- 18-Separation of a mixture of cinchonine and cinchonidine.

Statement	Answer number	Statement	Answer number
Lymphoid leukemia in children		Solubility in ether	
Dolichotheline		Anti AIDS, inhibition of reverse transcriptase	
Intercalation causing partial unwinding of the DNA helical array		Gout suppressant	
Protoveratrine A, B		Itch-relieving	
Reduction of KMnO_4		Reaction with Van Urk reagent	
Irinotecan, topotecan		Methylurethane & aromatic ring.	
By solubility in ammonium hydroxide		Reaction with ferric chloride	
By solubility in NaOH		Aconite root, neurotoxicity acting on sodium channels	
In cerebral senility, cerebral tumor with intracranial hypertension		GC/MS of TMS derivative	

Question D (60 marks, 30 min). You are provided with 30 sentences in the table below, record only ONE suitable answer.

Sentence	Answer
An alkaloid that acts as surface anesthetic and gives feathery crystals with PbI_2 is	
Tropine ℓ -tropate is named	
A respiratory stimulant alkaloid which is biosynthesized from phenylalanine and lysine by double Mannich reaction is	
An alkaloid with mice-like odor and gives red color with sodium nitroprusside is	
A strong basic alkaloid from pomegranate is	
A reagent used to precipitate areca alkaloids is	
A tetrahydropyridine oily liquid alkaloid when on hydrolysis produces plates insoluble in alcohol	
An alkaloid which on treatment with HCl at 260 °C produces nicotinic acid is	
A reagent used to test for atropine and nicotine is	
A process can be used to separate nicotine from nicotelline is	
A derivative formation used to isolate nicotine from nornicotine is	
The biosynthetic precursor of pyrrolidine ring in nicotine is	
Vanillyl amide of isodecenoic acid is	
Basic levorotatory volatile secondary amine as protoalkaloid is	
Basic dextrorotatory primary amine from khat is	
Psychoactive alkaloid from <i>Peyote cactus</i> is	
A mild hydrolysis product of an alkaloid used in gout treatment is	
One biosynthetic precursor for the studied protoalkaloids is.....	
The source of nitrogen in compound described in sentence 16 is	
Tropane alkaloids are used as taxonomic markers for the family	
Iodine potassium iodide is named reagent	
Color reagents of alkaloids contain Which causes dehydration	
Ammonium vanadat in acid is named reagent	
Reineckate complex of alkaloid is decomposed by using	
Alkaloid complex with Dragendorff's reagent is decomposed by	
Tannic acid complex of an alkaloid is decomposed by hydroxide	
Mayer's complex of an alkaloid is decomposed by	
The first isolated alkaloid is	
..... is used to get free alkaloidal bases from extracts rich in fats	
..... is used to get free alkaloidal bases in case of volatile alkaloids	

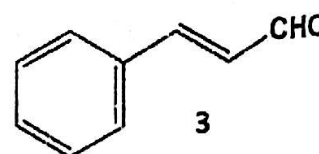
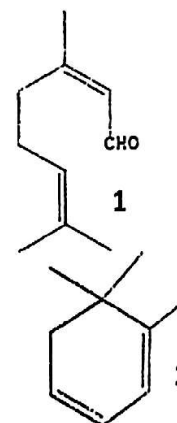
PART II (Volatile oils.....110 marks, 50 min):

This part include five pages (6-10)

All answers outside the answer sheet will not be considered for correction

You are provided with 45 multiple choice questions; select only one correct answer by filling in the blank spaces in the Answer Sheet.

- 1- The followings are the most useful volatile oils used in aromatherapy, except:
A-Chamomile B-Camphor C-Geranium D- Jasmine E- Rose
- 2- In aromatherapy, certain essential oils may stimulate the body to produce:
A- Pain-fighting substances B- Some emotional responses
C- Adrenaline D- Both A and B E- All of them
- 3- oil(s) is contraindicated if the patient has high blood pressure or epilepsy.
A- Thyme B- horseradish C- Bitter almond
D- Both A and C E- None of them
- 4- Essential oils are not the same as fragrance oils, as the later are:
A- Artificially created B- Have therapeutic benefits C-Used in perfume
D- Both A and C E- Contain only the distilled essence of plant
- 5- A blend of basil, eucalyptus, and thyme oils could be used for treatment of:
A- Bronchitis B- Arthritis C- Alzheimer's D- Back Pain E- Blood pressure
- 6- The following essential oil (s) could be used for addictions withdrawal:
A- Grapefruit B- Lavender C-Rosemary D- Orange E- All except C
- 7- Counter-current extraction:
A- Used for preparation of terpeneless volatile oils B- Used for Isolation of volatile oils
C- Used sometimes instead of fractional distillation D- Both A and B E- Both A and C
- 8-The best method for preparation of oil of Rose is
A- Solvent extraction B- Steam distillation C- Sponge method
D- Hydrodistillation E- Both B & D
- 9- Compound No. (1) is:
A- Occurs in nature as a mixture of 4 isomers.
B- Used as a starting material for synthesis of vitamin A C- Both A and B
D- Forms three different bisulfite compounds with sodium bisulfite
E- Reacts only with conc. solution of sod. sulfite
- 10- Compound No. (2) is:
A- Antidepressant
B- Used for treatment of neuropathic pains
C- Has antitumor activity D- All of the above E- Both B and C
- 11-.....has a pleasant almond-like odor and carcinostatic.
A- Gaultherin B- Benzaldehyde C- Amygdalin D- Both B and C E-Sinigrin
- 12- The oxidized product of compound (3) is:
A- Cardioprotective in a rat model of ischemic myocardial injury.
B- Natural antimicrobial C- Both A and B
D- Used for synthesis of vanillin E- All of them



13- The most economic method(s) used for preparation of vanillin is:

A- Extraction from vanilla pods

B- Reimer Tiemann's reaction starting with guaiacol

C- Oxidation of lignin

D- Synthesis from eugenol

E- Both B and C

14- Compound No. (4):

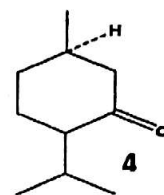
A- Occurs in oils of pennyroyal

B- Is a penetration enhancer for percutaneous absorption of tamoxifen

C- Can exist in four optically active modifications

D- All of them

E- Both A and B



15- Compound No. (5):

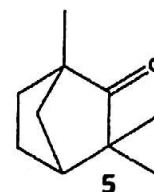
A- Occurs in lavender and sage oils

B- Its N-acyl derivative has antituberculosis activity

C- Both A and B

D- Tricyclic terpenes ketones

E- Both B and D



16- Bisulfite method is used mainly for quantitative determination of:

A- Aldehyde

B- Aldehydes and some methylated ketones

C- Ketones

D- Both A and C

E- None of them

17- Phosphoric acid method is used for:

A- Quantitative determination of cineol

B- Qualitative identification of cineol

C- Isolation of cineol

D- All of them

E- Both A and C

18- Compound No. (6):

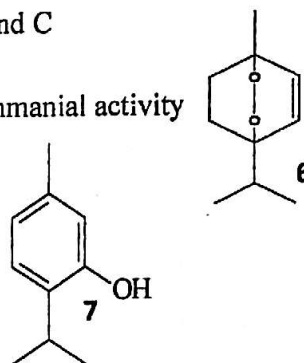
A- Is toxic at high dose

B- Has Anthelmintic and antileishmanial activity

C- Both A and B

D- Forms crystalline derivative with phosphoric acid

E- Could be isolated using Cocking & Hymas method



19- Compound No. (7):

A- Could be synthesized from m-cresol

B- Has antibacterial activity

C- Could be formulated in the form of nanoencapsulation

D- All of them

E- Both A and B

20- Compound No. (8):

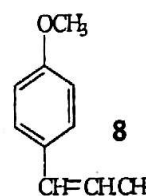
A- Could be synthesized from anisole by Friedel-Crafts reaction

B- Undergoes hydrolysis to yield photoanethole

C- Should be handled as a carcinogen

D- Occurs in caraway oil

E- All of them



21-..... is five times more potent than aspirin.

A- Thymol

B- Methyl salicylate

C- Eugenol

D- Cinnamic aldehyde

E- Gaultherin

22- Compound No. (9):

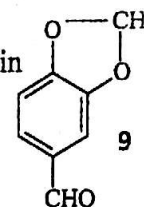
A- Results from oxidation of saffrole

B- Used as a flavoring agent

C- Both A and B

D- Its use was banned

E- Both B and D



23- A current of warm air is passed through the flowers and the air laden with essential oils will be recovered. This is the principle of:

A- Pneumatic method

B- Extraction using non-volatile solvents

C- Ecuelle a piquer method

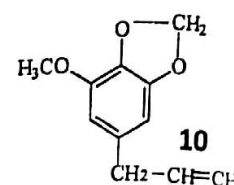
D- Maceration method

E- Enfleurage method

24- Compound No. (10):

- A- Cause apoptosis in human leukaemia cells
 B- 3-Methoxy-4,5-methylene dioxy-amphetamine (MMDA)
 C- Could be isolated by cooling
 D- Both A and B

E- Both A and C



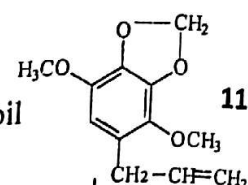
25- Distillation method is used for preparation of volatile oils in the following cases except:

- A- Thermostable oils
 B- Oils present in small amount
 C- Oils not rich in esters
 D- Oils present in fresh plant
 E- Oils present in large amounts

26- Compound No. (11):

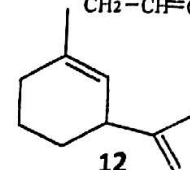
- A- Dihydric phenolic ether
 B- Abortifacient
 D- Isolated using KOH
 E- Both B and D

C- Present in Aniseed oil



27- Compound No. (12):

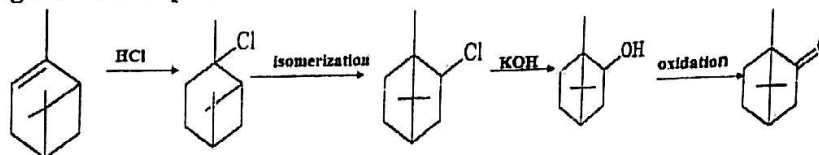
- A- Give blue color with acetic anhydride + conc. H₂SO₄ + conc. HNO₃
 B- Monocyclic, monoterpenes, saturated hydrocarbon
 C- Acyclic hydrocarbon
 D- Both A and B
 E- Both A and C



28- Enzymatic method is used mainly for preparation of the following volatile oils except:

- A- Allyl isothiocyanate
 B- Cinnamic aldehyde
 C- Methyl salicylate
 D- Eugenol
 E- Benzaldehyde

29- The following reaction represents:



- A- Commercial synthesis of vanillin
 C- Synthesis of terpene ketones
 D- Chemical reactions of terpene ketone

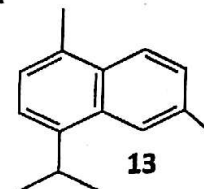
B- The importance of α -pinene

E- Both B and C

30- Compound No. (13):

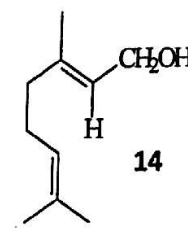
- A- Reacts with HCl gas to form crystalline derivative
 B- Obtained after cyclization of Zingiberine
 C- Both A and B
 D- Natural anticancer agent

E- All of them



31- Compound No. (14):

- A- Forms phthalate ester with phthalic anhydride
 B- Forms semicarbazone derivative
 C- Decomposes to hydrocarbone if reacted with phthalic anhydride at 200°C
 D- Both A and B
 E- None of them

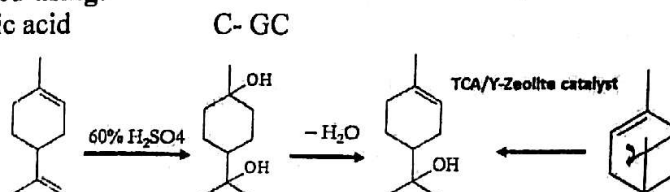


32- Azulene Derivatives could be isolated using:

- A- Phosphoric acid
 B- Sulphuric acid
 C- GC
 D- Ferrocyanic acid
 E- All of them

33- The opposite reaction represents:

- A- Reaction of α -pinene
 B- Dehydration of terpene alcohol



C- Commercial method for preparation of α -terpineol

D- Both B and C E- All of them

34- has neuroprotective effect.

A- Zingiberine B- Limonene

C- Cadinene

D- α -Pinene

E- Camphene

35- Compound No. (15):

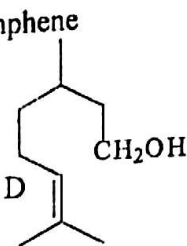
A-Has anticonvulsant activity

B- Can be determined by formylation

C- Both A and B

D- Dehydrated by conc. formic acid and converted to hydrocarbon

E- Both A and D



36- Geraniol is:

A- Optically inactive

B- Converts to citral upon oxidation

C- Gave terpin hydrate when treated with dil. H_2SO_4

D- Both A and C

E- All of them

37- Compound No. (16) when treated with glacial acetic acid and acetic anhydride gives:

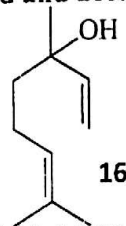
A- Geraniol

B- Citral

C- α -terpineol

D- Mixture of α -terpinene and dipentene

E- None of them



38- ... inhibits cigarette smoke-induced lung inflammation by inhibiting NF- κ B activation.

A- Linalool

B- Geraniol

C- Benzyl benzoate

D- Menthol

E- α -terpineol

39- Compound No. (17):

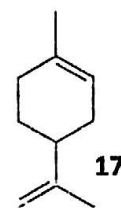
A- Has promoting effect on the percutaneous absorption of indomethacin

B- Auto-oxidized when treated with acids

C- Acyclic monoterpenes, unsaturated hydrocarbon

D- Both A and B

E- Both A and C



40- Expression of rasping method is used mainly for preparation of:

A- Heat sensitive oils

B- Thermostable oils

C- Oils present in large amounts

D- Both A and C

E- None of them

41- Compound No. (18):

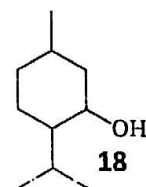
A- Synthesized by hydrogenation of pulegone

B- Isolated by cooling the oil containing it

C- Used for preparation of menthone

D- Inhibits inflammatory and oxidative stress

E- All of them



42- Supercritical fluid extraction is used mainly for:

A- Preparation of good quality oils

B- Saving solvents

C- Economic purpose

D- Both A and B

E- All of them

43- Compound No. (19):

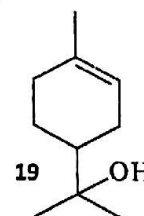
A- Used for preparation of α -Pinene

B- Used for treatment of rhinitis.

C- Has antimicrobial activity against periodontopathic and cariogenic bacteria.

D- Occurs in pine oil

E- Both A and C



44- Compound No. (20):

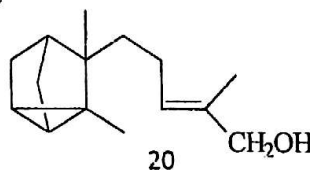
A-Diterpene tricyclic alcohol

B- Used in the treatment of viral-induced tumors

C- Forms semicarbazone derivative

D- Both A and B

E- Could be isolated by cooling



45- Borneol could be separated from isoborneol by:

A- Heating with zinc chloride in benzene

B- Chromatographic method using stereo-specific stationary phase

C- Both A and B

D- Reaction with acid phthalate

E- All of them

Answer Sheet

No.	A	B	C	D	E	No.	A	B	C	D	E	No.	A	B	C	D	E
1						16						31					
2						17						32					
3						18						33					
4						19						34					
5						20						35					
6						21						36					
7						22						37					
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GOOD LUCK