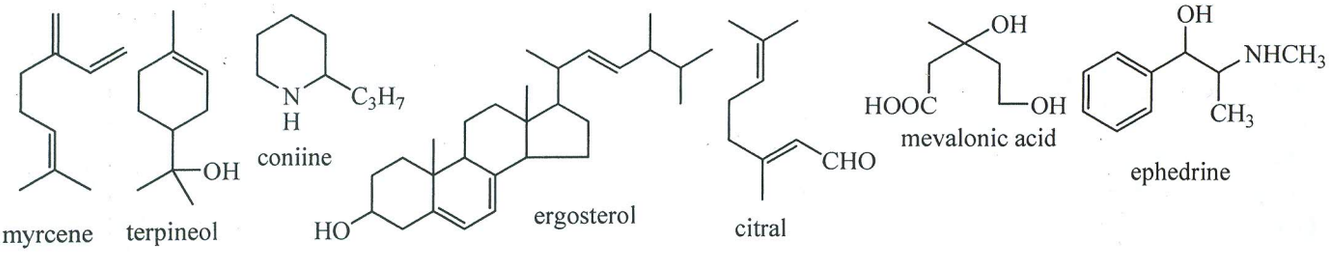
Mansoura University
Faculty of Science
Department of Chemistry
Second Semester Exam (2014/2015)

CHEM 335
Natural Products' Chemistry
Time allowed: 2 hours
Full Mark: 60 Marks

ANSWER THE FOLLOWING QUESTIONS



Question (I):

(A) In your answer notebook write the letter representing the right statement for the following (24 marks).

1- Phenylalanine [$PhCH_2CH(NH_2)COOH$] can be produced from:
(a) Shikimic acid pathway (b) Mevalonic acid pathway
(c) Polyketide pathway (d) All of them

2- Shikimic acid pathway starts by Aldol-like reaction between phosphoenol pyrovate and:
(a) phosphorylated isoprene unit (b) acetyl CoA
(c) malonyl CoA (d) erythrose-4-phosphate

3- The precursor of diterpenes is:
(a) geraniol (b) farnesol (c) geranylgeraniol (d) squalene

4- Myrcene reacts with maleic anhydride to give a Diels-Alder adduct.
(a) True (b) False

5- The number of isoprene units in sesquiterpenes is:
(a) 1 (b) 2 (c) 3 (d) 4

6- Treatment of α-terpineol ($C_{10}H_{18}O$) with Br_2/CCl_4 gives a compound of the formula:
(a) $C_{10}H_{18}BrO$ (b) $C_{10}H_{18}Br_2O$ (c) $C_{10}H_{18}Br_3O$ (d) $C_{10}H_{18}Br_4O$

7- Nerol cyclizes in dil. H_2SO_4 to form α-terpineol 9 times faster than Geraniol, this indicates that:
(a) Nerol is the trans-isomer (b) Nerol is the cis-isomer
(c) Geraniol is the cis-isomer (d) Both (a) and (c)

8- Distillation of a steroid with selenium gives:
(a) Naphthalene (b) Anthracene (c) Phenanthrene (d) Diel's hydrocarbon

9- Ozonolysis of Ergosterol indicated the presence of one double bond in the side chain between:
(a) C-20 & C-21 (b) C-20 & C-22 (c) C-22 & C-23 (d) C-23 & C-24

باقى الأسئلة فى الخلف

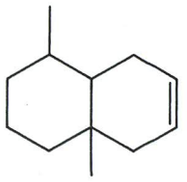
10- Pregn-4-en-3,20-dione (Progesterone) belongs to:
(a) Sex hormones (b) Bile acids (c) Sterols (d) Cardenolides

11- Heating of coniine with hydroiodic acid at 300°C under pressure gives:
a) Isooctane (b) 2-Methyloctane (c) n-Octane (d) Cycloocatne

12- Cholesterol has a hydroxyl group (OH) at:
(a) C-2 (b) C-3 (c) C-4 (d) C-6

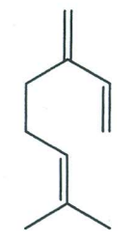
(B) Sesquiterpene **A**, $C_{15}H_{26}$, when hydrogenated gave **B**, $C_{15}H_{28}$.
Treatment of **A** with hot acidic permanganate gave acetone and **C**, $C_{12}H_{20}O$.
Treatment of **C** with $LiAlH_4$ gave **D**, $C_{12}H_{22}O$.
Treatment of **D** with hot conc. H_2SO_4 gave **E**.
Give the structure of **A**. (6 marks).

E

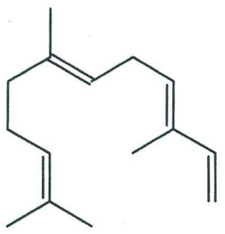


Question (II):

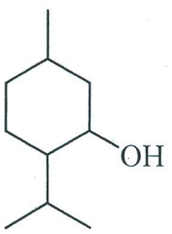
1. Locate the isoprene units in the following terpenes, use the sign - - - - - to indicate "head to tail" joint and the sign ∧∧∧∨ to indicate the ring closure. (9 Marks)



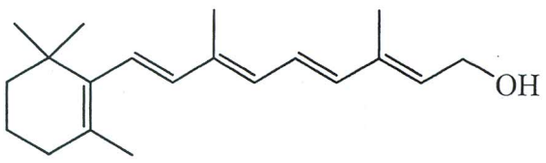
Myrcene



α-Farnesene



Menthol



Vitamin A

2. How can you prove that nicotine ($C_{10}H_{14}N_2$) contains a pyridine ring substituted at the 3-position by a group $C_5H_{10}N$? Write the complete structure of nicotine. (6 Marks)

Question (III): Illustrate by chemical equations the following conversions: (15 Marks, 3 for each)

1. Mevalonic acid into α-terpineol.
2. Citral into a mixture of α-ionone and β-ionone.
3. Ergosterol into vitamin D2.
4. Benzyl chloride into β-phenyl ethyl amine.
5. 1-Phenyl-1,2-propandione into ephedrine.

Best Wishes: Prof. Mamdouh Abdel-Mogib, Prof. Dr. Ehab Abdel-Latif and Dr. Mona Elsayed

Mansoura University
Faculty of Science
Botany Department
Mansoura - Egypt

جامعة المنصورة
كلية العلوم
قسم النبات
المنصورة- مصر

Final examination in Botany
Second Term May 2015

Educational Year: Third level **Program (Branch):** Chemistry / Botany
Subject: B (317) **Course:** Bacteriology - Virology
Time: 2hrs. **Date:**28 /5/2015 **Full mark:** 60 **Question mark:** 20

Answer the following questions (الامتحان في صفحتين)

Q1):

Discuss each of the following:

a- Structure, maturation and properties of bacterial endospore. **(7 Mark)**
b- Bacterial polymorphism. **(3 Mark)**
c- Functions of cytoplasmic membrane of bacteria. **(5 Mark)**
d- Chemical structure of murien. **(5 Mark)**

Q2):

A) **Compare between each pair of the following:**

a- Flagella and pili. **(5 Mark)**
b- Mesosomes and ribosomes. **(5 Mark)**

B) I) **With clear labeled diagram and commentary notes describe only ONE of the following:-** **(6 Mark)**

a- Lysogeny cycle for viral replication. **(6 Mark)**
b- Morphological classes of bacteriophages. **(6 Mark)**

II) **Concisely explain only ONE of the following:-** **(4 Mark)**

a- Chemical nature of viral protein with respect to structure, types and functions. **(4 Mark)**
b- The nature of the viruses. **(4 Mark)**
c- Only one tool for plant viruses' cultivation. **(4 Mark)**

Q3):

Answer each of the following as requested:-

A): Purified FBNYV has $A_{280}/A_{260} = 2$, Although by using differential centrifugation it was estimated as 1.3 determine the cause and explain the repairing using other type of centrifugation. **(5 Mark)**

B): Chose the most correct answer (4 Mark)

1- Based on types of nucleic acids viruses may be classified into ---------- groups.
a) one b) two c) three d) none

2- Viruses may be present in crystal form ---------- the host.
a) outside b) inside c) a and b d) none

فضلا تابع التالي

3- Symmetrical pattern in bacterial viruses may be ----------.

a) helical b) icosahedral c) a and/or b d) a and b

4- The viral purity can be determine---------

a) physically b) biologically c) chemically d) all

C): Fill the gaps in the following sentences (5 Mark)

1- Chemically viral constituents are ----------, ---------- and ----------.

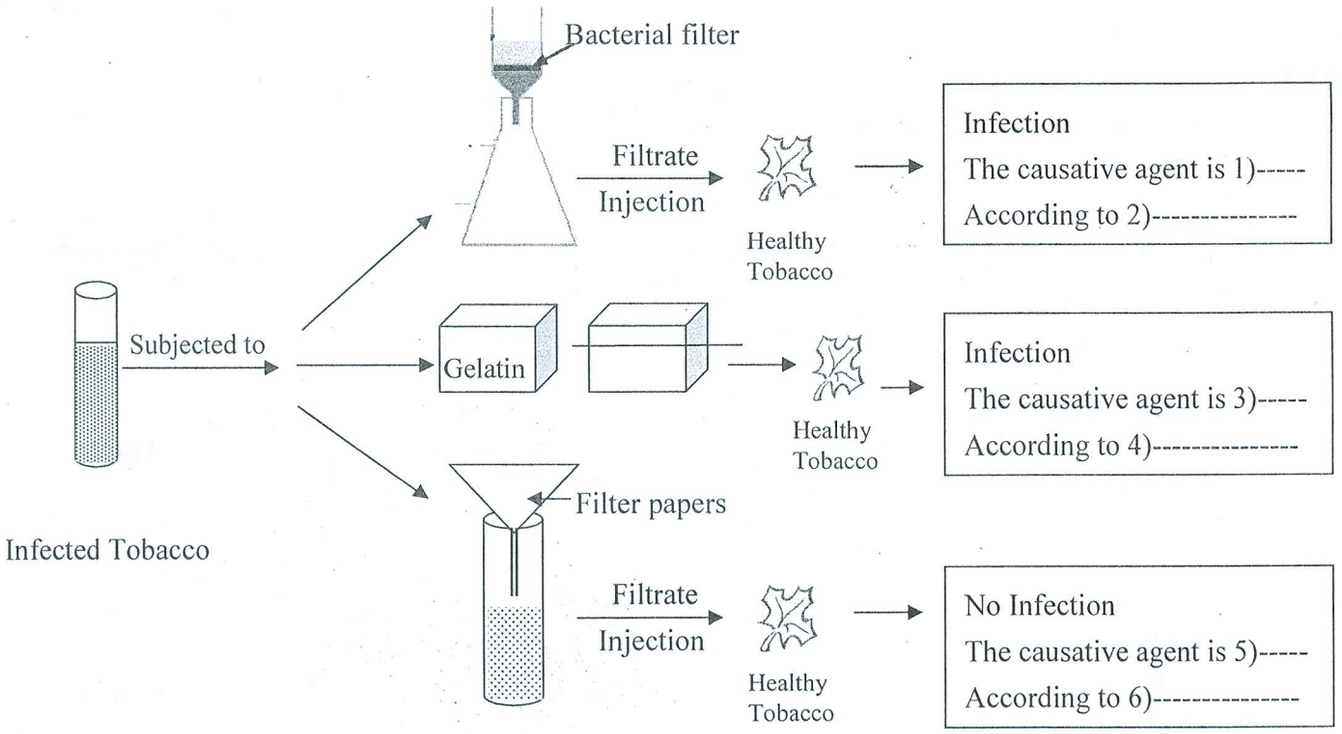
2- ---------- a group of proteinaceous infectious agent that cause diseases to animals only.

3- Mutation of temperate phage to virulent phage was due to----------and ----------.

4- Fenner's role for viral maintenance state that ----------.

5- Viruses are used as a very powerful tool in the molecular biology field because of:----------
,----------and----------.

D): Complete the next diagrams:- (6 Mark)



With our best wishes

Examiners:- *Prof. Attiya H. Mohamedin* *Dr. Adel A. El-Morsi*

Mansoura University
Faculty of Science
Botany Department
Mansoura - Egypt

جامعة المنصورة
كلية العلوم
قسم النبات
المنصورة – مصر

Final Examination in Botany (June 2015)

Educational Year: 3rd level
Course(s): Plant tissue culture and hydroponics
Time: 2 hrs
Full mark: 60

Subject: Botany (B.319)
Program: Botany and Chemistry
Date: 1 / 6 / 2015
Question mark: 20

Answer the following questions:

Q1: Explain briefly the techniques of hydroponics with special reference to the main types of hydroponics.

Q2: **A- Discuss only one of the following:**

i- Basic principles of hydroponics.

ii- Advantages and disadvantages of hydroponics.

B- Mention the advantages of plant tissue culture techniques in improving production of 2ry metabolites.

Q3: **Explain briefly how can each of the following cultures be produced:**

i- Anther culture.

ii- Protoplast fusion.

iii- Cell suspension culture.

Examiners:

Prof. M. A. Abbass **Prof. S. A. Abo-Hamed**

Mansoura University **Faculty of Science** **Chemistry Department** **Code: Chem.341** **Subject : Electrochemistry**	كلية العلوم جامعة المنصورة	**Third Level - Second Term** **Program : Chem./Botany** **Date : June 2015** **Time Allowed : 2 hours** **Full Mark : 60 Marks**

Answer All Questions الأسئلة على الوجهين

First Question : **(20 Mark)**

[A] Write in detail on :

(i) Decomposition potential. **(8 Mark)**

(ii) Concentration overpotential,illustrating your answer by mathematical derivation of the relation between η_c and current i. **(8 Mark)**

[B] Complete : **(4 Mark)**

(i) Ohmic overpotential is due to .....

(ii) Maxwell distribution law is given by .....

Second Question : **(20 Mark)**

[A] Derive the Nernst equation relating electrode potential with concentration. **(8 Mark)**

[B] Write on: **(6 Mark)**

(i) Gas electrode. (ii) Liquid junction potential. (iii) Exchange current i_o.

[C] For the cell : **(6 Mark)**

Ag / Ag Cl / KCl / Hg_2Cl_2 / Hg

Taking : $E^o_{Hg2Cl2/Hg} = 0.280$ V ; $E^o_{Ag\,Cl/Ag} = 0.212$ V

(i) Write the electrode and cell reactions.

(ii) What is the type of the cell ? and why?

(iii) Calculate for the cell: (a) E^o (b) ΔG (c) equilibrium constant K

Third Question : **(20 Mark)**

[A] Give reason: **(6 Mark)**

1) Presence of MnO_2 in Le Chlanche' cell.

2) Saturated KCl solution is the mostly preferred in salt bridge.

3) Glass electrode is the convenient one for measuring solution pH.

[B] Complete : **(6 Mark)**

(i) Overvoltage η is the difference between ..... and .....

(ii) The transport number of the anion or the cation is .....

(iii) As an example of amalgam electrode concentration cell without transference .....

(iv) As an example of electrolyte concentration cell without transference .....

[C] The standard Weston-cadmium cell has emf given by: **(8 Mark)**

$E = [\ 1.0186 - 4.06 \times 10^{-5}\ (t - 20)\ ]$ volt

Calculate at $25^{\circ}C$:

(i) ΔG (ii) ΔH (iii) ΔS (iv) equilibrium constant K

Good Luck

Prof.Dr. A. El- Askalanee