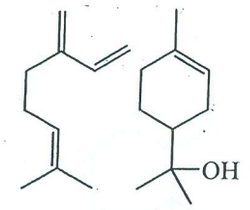
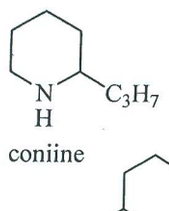
Mansoura University
Faculty of Science
Department of Chemistry
Second Semester Exam (2014/2015)

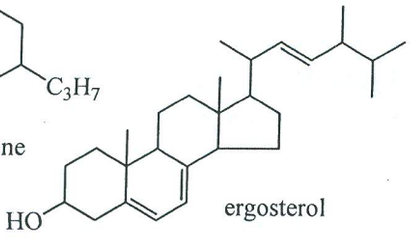
CHEM 335
Natural Products' Chemistry
Time allowed: 2 hours
Full Mark: 60 Marks

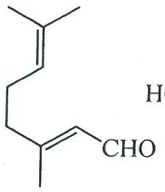
ANSWER THE FOLLOWING QUESTIONS

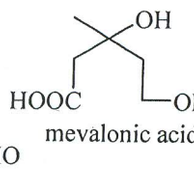

myrcene

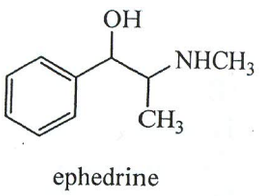
terpineol


coniine


ergosterol


citral


mevalonic acid


ephedrine

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

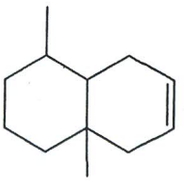
10- Pregn-4-en-3,20-dione (Progesterone) belongs to:
(a) Sex hormones (b) Bile acids (c) Sterols (d) Cardenolides

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

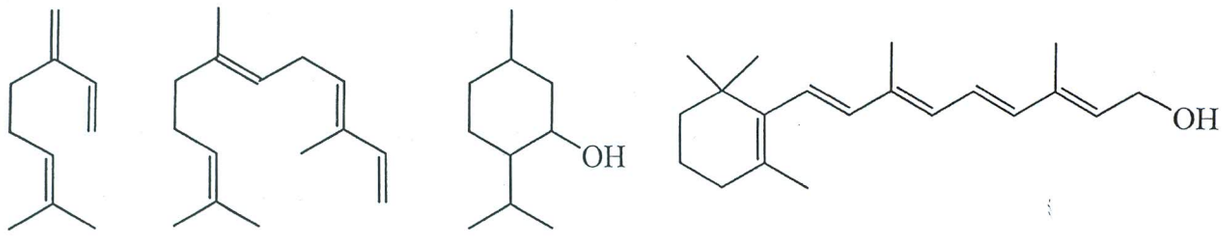
(B) Sesquiterpene **A**, $C_{15}H_{26}$, when hydrogenated gave **B**, $C_{15}H_{28}$.
Treatment of **A** with hot acidic permanganate gave acetone and **C**, $C_{12}H_{20}O$.
Treatment of **C** with $LiAlH_4$ gave **D**, $C_{12}H_{22}O$.
Treatment of **D** with hot conc. H_2SO_4 gave **E**.
Give the 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 Chemistry Department Code: Chem.341 Subject : Electrochemistry	كلية العلوم جامعة المنصورة	Third Level - Second Term Program : Chem./Zoology 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 $25^{o}C$:

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

Good Luck

Prof. Dr. Ahlam. M.Helmy

Mansoura University
Faculty of Science
Zoology Department

May 2015
Third year
Subject: Aquatic fauna
Date: 8 June 2015
Time Allowed: 2hr

Answer the following questions

Question One: **(15 Marks)**

1- Compare between the three classes of Annelida.
2- Describe the life cycle of an animal that shows alternation of generation.
3- Write on the body plan of a rotifer and its feeding.

Question Two: **(15 Marks)**

A- Write about the most important five characters of Phylum Cnidaria and Phylum Arthropoda.
B- Describe the reproduction of marine sponge.
C- Define cyclomrphosis, parthenogenesis and regeneration.

Question Three : **(15 Marks)**

With labeled drawings what do you know about each of the following:
- Parasitic cirripedes - Eumalacostracan amphipods - Foot in Mollusca
- Mantle and pearl formation in pelecypods.

Question Four : **(15 Marks)**

Comment on each of the following :
1- Characters of Cephalopoda
2- Torsion in gastropods
3- Subclasses of Lamellibranchiata and their orders

With best wishes

Prof. Dr. Mohamed Fathy Abdel-Aal Mansour
Dr. Sherif Ramadan