المستوى الثالث - كيمياء حيوية - كيمياء حركية - كيمياء ضوئية (ك ٣٦٤)
كيمياء نبات
كيمياء حيوان

Mansoura University
Faculty of Science
Chemistry Dept.
3rd Year Gen. Chem.

2d Semester 2012
Chem. 364
Full Mark **[80]**
Time Allowed 2hr

Final Examination

Answer the Following Questions:

1)(a) Which conditions can increase the rate of chemical reactions?[4]

(b) Explain what do you understand by the terms?
i- activation energy, ii- steady-state approximation and iii- active collisions of molecules. [6]

(c) What are the consequences of Light Absorption? [5]

2) Compare between three ONLY of the following: [15]

(a) Fluorescence and phosphorescence and give only two applications for each.

(b) Half-life time for zero and first order

(c) The value of [B] for parallel and consecutive reactions.

(d) Rate equation for the reactions;

$$A \xrightarrow{k_1} B \quad , \quad A \underset{k_2}{\overset{k_1}{\rightleftharpoons}} B$$

3) Deduce the equations used for calculating the order of reaction using the initial rate and half-life time methods. [10]

4) A first order reaction 30 %of its initial concentration was consumed in 20 minutes. Calculate the half- life time and the rate constant of this reaction. [10]

5) For the photochemical reaction; $A \rightarrow B$, 1×10^{-5} M of B is formed on absorption of 6.60 J at 3600 Å. Calculate the quantum yield. Comment on the result. [15]

6) Given the following data for the reaction, $A + B \rightarrow$ Products,

[A](mol L^{-1})	[B](mol L^{-1})	Rate (mol $L^{-1}s^{-1}$)
1.0×10^{-4}	1.0×10^{-4}	1.23×10^{-6}
1.0×10^{-4}	2.0×10^{-4}	2.46×10^{-6}
2.0×10^{-4}	1.0×10^{-4}	4.92×10^{-6}

Calculate the order and rate constant, of the reaction.[15]

Good Luck Prof. Shawky Hassan, Prof. MOH. Emam Dr. Maani Hamada

المستوى الثالث - كيميا ونبات - كيميا وحيوان ك ٣٤١
كيميا وطبيعة

Mansoura University
Faculty of Science
Chemistry Department

Code: Chem.341
Date : June 2012
Subject :
Electrochemistry

Second Term
Third Level
Program : Chem/Botany, Chem/Zoology&Biophy.

Time Allowed : 2 hours
Full Mark : 60 Marks

Answer All Questions الأسئلة على الوجهين

First Question : (15 Mark)

(1) Given the cell : *Pt,* $H_{2(g)}$ *(1atm) / HCl (* a_1 *) / HCl (* a_2 *) / (1atm)* $H_{2(g)}$ *, Pt*

(i) Complete : The type of the cell is ....
because.. (3 Mark)

(ii) Deduce in detail the cell emf (7 Mark)

(2) The following values of the emf of the cell: $Ag|AgBr_{(s)}, KBr, Hg_2Br_2|Hg$

at various temperatures is given as follows:

t^oC	20	25	30
E, V	0.06630	0.06839	0.07048

write the electrode reactions, cell reaction and calculate at 25°C:

(i) E (ii) ΔG (iii) ΔH (iv) ΔS (5 Mark)

Second Question : (15 Mark)

Write on :

(i) Liquid junction potential (E_j)
(ii) Gas electrodes . (iii) Exchange current (i_o)
(iv) Metal- insoluble metal oxide electrode

Third Question : (15 Mark)

Give reason :

(i) Chemical cells with transference are not suitable for exact thermodynamic calculations.
(ii) Presence of MnO_2 in Le Clanche' cell.
(iii) During discharging of lead-acid cell , H_2SO_4 is diluted.
(iv) Saturated KCl solution is preferred in salt bridge.
(v) Glass electrode is the most convenient one for measurement of pH.
(vi) The potential of calomel electrode depends on the activity of chloride ion.

Fourth Question : **(15 Mark)**

Complete :

(1) For the $H^+/H_{2(g)}$ reaction at Pt electrode the value of the exchange current is..... and the process is..... while at Hg is..... and the process is..... while at Hg electrode the value of the exchange current is.....and the process is.....

(2) In lead-acid cell, ...is the anode, while.....is the cathode.

(3) In Le Clanche' dry cell,..... is the anode and its reaction is.....
while.....is the cathode and its reaction is.....

(4) Concentration overpotential is due to.....

(5) Maxwell distribution law is given by the expression : .....

(6) When the electrode is polarized,the overpotential plays two roles:
(i).....
(ii).....

(7) The overpotential necessary for elecctrolysis of water is.....

(8) Electrical work = ----------

(9) Equation : -------- = ---------- represents the bridge between thermodynamics and electrochemistry.

(10) An inert metal immersed in a solution containing two oxidation states of the same metal is called ----------

(11) The transport number of the anion or cation is ----------

(12) As an example of amalgam electrode concentration cell----------

(13) As an example of electrolyte concentration cell without transference--------

(14) In Cd-Weston cell.....is the –ve electrode and ..... is the + electrode.

(15) Nernst equation relates .....with.....

٣ كيمياء ونبات - كيمياء منتجات طبيعية ك ٣٢٥

Mansoura University
Faculty of Science
Chemistry Department
Mansoura, Egypt

جامعة المنصورة
كلية العلوم
قسم الكيمياء
المنصورة – مصر

Second Semester Jun 201٢

Educational Year: 3ed Year Chemistry & General.
Course (s): Natural Products.
Date: 11/06/2012.
Course Code: CH 335.

Subject: Chemistry.
Full Mark: 60.
Time: 2 hrs.

Answer the following questions

1 – a) Explain how α-terpineol is biosynthesized from acetyl-Co A. (10 marks)

b) Write the chemical structure of the following compounds and their classification (5 marks)

1- α-ionone
2- Limonene
3- Nerol
4- Ergosterol
5- Pregn-4-en-3, 20-dione
6- Ephedrine
7- Nicotine
8- Heroin
9- Morphine
10- Ephedrine

2 - Provide the chrmical reactions, which elucidate the chemical structure of ergosterol and how ergosterol is converted to vitamine D_2? explain your answer by chemical equations. (15 marks)

3 - Illustrate by chemical equations the conversion of the following: (15 marks)

a) Dehydroepiondrosterone into testosterol.
b) 2-(1-naphthyl)-ethyl magnesium bromide into diel´s hydrocarbon
c) 3-cyano pyridine into nicotine.

4 – Clearly show the structure elucidation of the following: (15 marks)

a) Myrcene
b) Geraniol

Prof. Dr. MM Abou-Elzahab, Prof. Dr. M Berghot & Dr. M Elsayed

المستوى الثالث - كيمياء ونبات - كيمياء كهربية (ك ٣٤١)
كيمياء وحيوان

Mansoura University
Faculty of Science
Chemistry Department

Code: Chem.341
Date : June 2012
Subject : Electrochemistry

Second Term
Third Level
Program : Chem/Botany, Chem/Zoology&Biophy.

Time Allowed : 2 hours
Full Mark : 60 Marks

Answer All Questions الأسئلة على الوجهين

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Second Question : (15 Mark)

Write on :

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(ii) Gas electrodes . (iii) Exchange current (i_o)
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(15) Nernst equation relates .....with.....

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Faculty of Science
Botany Department
El-Mansoura, Egypt

جامعة المنصورة
كلية العلوم
قسم النبات
المنصورة - مصر

Final Examination in Botany
Second Term: June. 2012

Educational Year: Third Level **Program (Branch): Botany/Chemistry**
Subject: N(319) **Course(s): Plant nutrient and tissue cultures**
Time: 2 hrs **Date: 18 / 06 /2012** **Full mark:** 60 **Question mark: 20**

Answer the following questions:

Q1 What are the basic requirements of hydroponics, write briefly on the composition and types of plant nutrient cultures. **(20 mark)**

Q2 **A:** Discuss the advantages and constraints of soilless cultures. **(10 mark)**

B: Describe protoplast culture, its initiation and uses. **(10 mark)**

Q3 **A : Define the following terms:** **(10 mark)**

Totipotency theory, explant, callus, differentiation, embryogenesis, morphogenesis, rejuvenation, subculture, hardening off, and micropropagation.

B: Describe the following: **(10 mark, 2 mark each)**

i- Significance of plant tissue culture for society.

ii- Phytohormones and their role in plant tissue culture.

iii- Different types of calli.

iv- Methods of initiation and establishment of a plant cell suspension culture.

v- General steps of plant regeneration from callus.

Best wishes

Examiners: Prof. Mohamed A. Abbas Dr. Farag Ibraheem

٣ كيمياء ونبات - علم البكتريا والفيروسات (ن ٣١٧)

Mansoura University
Faculty of Science
Botany Department
Mansoura - Egypt

جامعة المنصورة
كلية العلوم
قسم النبات
المنصورة- مصر

Final examination in Botany
Second Term May 2012

Educational Year: Third level **Program (Branch):** Chemistry / Botany
Subject: B (307) **Course:** Bacteriology - Virology
Time: 2hrs. **Date:**4 /6/2012 **Full mark:** 60 **Question mark:** 20

Answer the following questions (الامتحان في أربع صفحات)

Q1):-

A): True and false (circulate the correct response); correct simply the wrong one (5 Mark)

1- (T – F) Virion : is the active virus in its specific host. ----------
2- (T – F) The earliest recorded plant viral disease was mosaic by Carlos closus----------
3- (T – F) Viral cultivation means support replication inside living system.----------
4- (T – F) Based on types of nucleic acids viruses may be classified into three groups.----------
5- (T – F) Bacteriophages were named by Towrt ----------

B): Chose the most correct answer (5 Mark)

1- Viruses may be present in crystal form ------- the host.
a) outside b) inside c) a and b d) none
2- The viral purity can be determine--------
a) biologically b) chemically c) physically d) all
3- Viral symmetrical pattern may be ----------.
a) helical b) icosahedral c) a and b d) a and/or b
4- ---------- animal viruses have outer envelope.
a) No b) Some c) All d) Most
5- Wood-rouf and Good-pasture used for ------ virus cultivation
a) plant b)bacterial c) insect d) animal

D): Prove only one of the following facts: (4 Mark)

i) Only nucleic acid is the genetic information carrier in viruses.**(4 Mark)**
ii) Mechanical transmission of most viruses. **(4 Mark)**

فضلا تابع التالي

٣ كيمياء نبات مناخ وتصنيف زهرى وكسائى (٣٨٣)

Mansoura University
Faculty of Science
Botany Department
El-Mansoura, Egypt

جامعة المنصورة
كلية العلوم
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المنصورة - مصر

Final Examination in Botany
Second Term: Jun. 2012

Educational Year: Third Level **Program (Branch): Botany / Chemistry**
Subject: Bot (318) **Course(s): Climate-Plant Cover & Taxonomy**
Time: 2 hrs **Date: 14 /6 /2012** **Full mark: 60** **Question mark: 20**

Answer the following questions:

Q.1 A- Answer each of the following either true (√) or false (X): (10 marks)

1- Wind has both direct and indirect effects on plant community.
2- Secondary succession starts on the extremely bare areas.
3- Drought enduring plants are short lived plants.
4- Absolute humidity has the same meaning of relative humidity.
5- Plant migration is considered successful when its pioneers give new individuals.
6- Physical drought is the presence of water in an excess amount but not available to plants.
7- Light intensity is affected by the layer of vegetation.
8- Climax stages in vegetation development are determined by soil factors.
9- Preferential halophytes are plants show optimum growth in saline habitats.
10- Evaporation can be measured by anemometer, while wind is measured by atmometer.

B- Complete the following sentences: (10 marks)

1- Plants grow in low light intensity is called .....
2- Oligohalophytes are plants growing in ..... habitats, while ..... are resisting salts by desalinization of their tissues.
3- Communities of mesophytes can be classified into ..... and .....
4- Snow is ..... and hail is .....
5- ..... hydrophytes are adapted to grow either in shallow water or on the muddy substratum.
6- The boundary between the troposphere and the stratosphere is called .....
7- The study of the relationship between different communities and their environment is called .....

Q.2 A- Write on <u>Two Only</u> of the following: (10 marks)

1- Classification of xerophytes.
2- Liquid forms of precipitation
3- External and internal features of halophytes.

B- Answer with (√) or (X). (10 marks)

1- In Dialypetalae perianth is differentiated into calyx and corolla.
2- Chenopodiaceae is salt loving plants.
3- Leaves in *Musa* with transverse parallel venation.
4- In *Delphinum* fruit is follicle and corolla only two.
5- Umbelliferae with only functional half anther.
6- Palmae is a monocot family but it has leaves with pinnate venation.
7- In Moraceae inflorescence is cymose with three coloured bracts and three flowers.

Mansoura University
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El-Mansoura, Egypt

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Final Examination in Botany
Second Term: Jun. 2012

8- Perianth is scally in family Liliaceae.
9- Leaves are rounded with tendril petiol in family Geraniaceae.
10- In family Solanaceae style is gynobasic and stem quaderangular.

Q3. A- Fill the space with the correct word: (10 marks)

1- In Casuarinaceae fruits is .....
2- Some stamens are modified into petals in ..... and .....
3- ..... a plant under subfamily Pomoideae.
4- Labiatae have ..... inflorescence.
5- Aestivation of petals in Papilionoideae are ..... while in Caesalpinoideae are .....
6- In family ..... and ..... petals are differentiated into claw and limb.
7- Branches of *Salvadora* are used as .....
8- Inflorescence in *Salix* is ..... while in *Pelargonium* is .....
9- Leaves of ..... with stellate hairs while leaves of ..... with simple or branched hairs.
10- Family Cruciferae belong to order .....
11- Sepals are petaloid and the posterior are modified into spure in family ..... and .....
12- ....., ... and ..... are genera under family Lemnaceae.

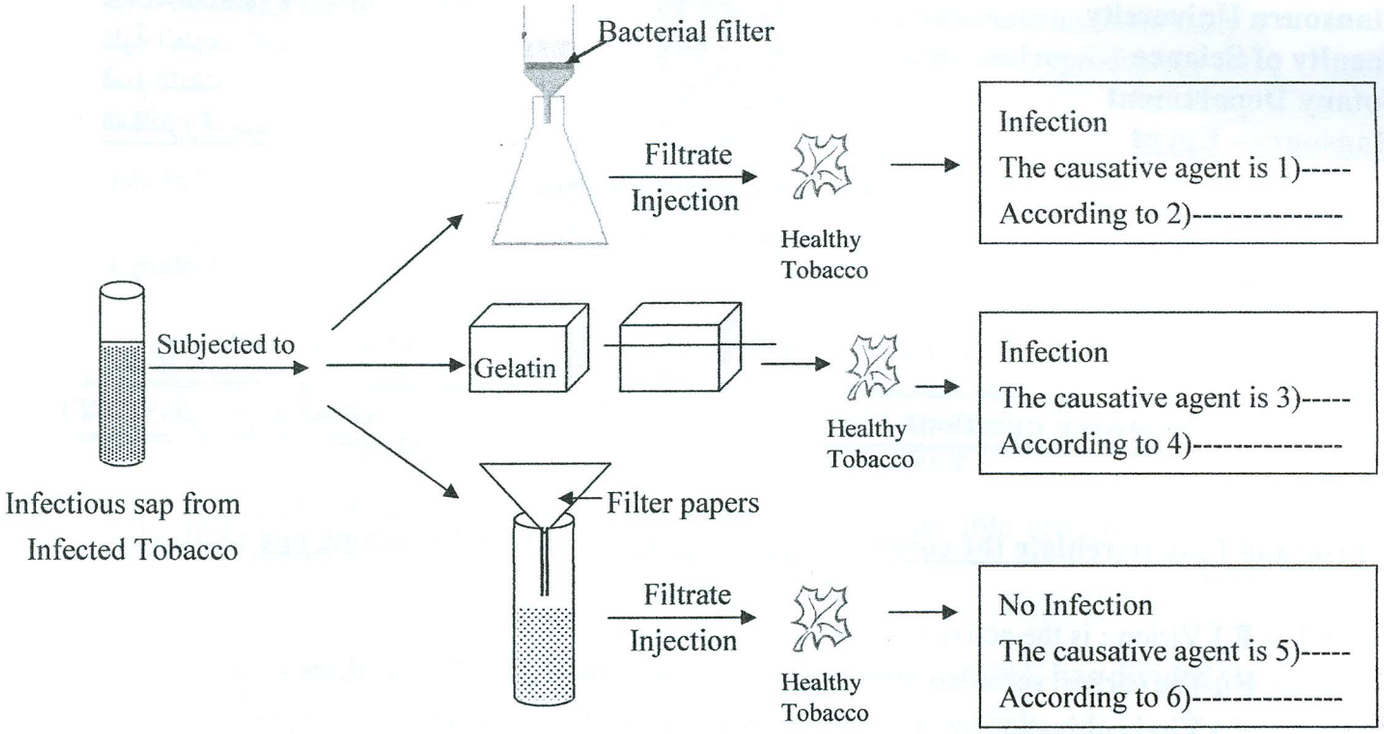
B- Give the taxonomic term: (5 marks)

1- Stamens are six, two outer short and four inner long.
2- Stamens are opposite to petals.
3- Perianth absent or not differentiated into calyx and corolla.
4- In Cruciferae ovary unilocular but become bilocular because the development of the false septum.
5- Stamens are four, two short and two long.

C- Write short notes on the general characters of subfamily Rosoideae. (5 marks)

Examiners: **Dr. Ehsan El-Habashy** **Dr. Yasser El-Amier**

C) : Complete the next diagram:- (6 Mark)



Q2):

A)With clear labeled diagram and commentary notes describe only TWO of the following:- (10 Mark)

a- Chick embryo technique for viral cultivation. **(5 Mark)**

b- The architecture (morphological classes) of bacterial viruses. **(5 Mark)**

c- Only one tool of virus purification and outline the criteria of purity. **(5 Mark)**

d- Chemical nature of viral protein with respect to types and functions. **(5 Mark)**

B) Answer each of the following questions as requested? (10 mark)

1- Why are ribosomal RNAs better molecules for phylogenetic studies than proteins on bacteria? **(2 mark)**

2- Bacteria can be beneficial and detrimental. Discuss these beneficial and detrimental effects giving specific examples where appropriate. **(3 marks)**

3- Halophilic bacteria maintain low concentrations of salt in their cytoplasm by balancing osmotic potential with organic, compatible solutes. Explain this statement.(3 marks)

4-Outline the different approaches used for the identification of actinobacteria. **(2 mark)**

Q3):

Choose the correct answer(s):(Total mark= 20,each one mark)

1- Which is not true of the rickettsias?

a- They are obligate intracellular parasites. b- They can cause human diseases often characterized by a rash.
c- They reproduce by fragmentation. d- They are typically transmitted by insects and ticks.
e- They are classified as alpha-proteobacteria.

2- Which of the following is an endospore-forming bacterium?

a- Brevibacterium b- Streptococcus c- Nocardia
d- Corynebacterium e- Streptomyces

3- Which of the following is not in the Actinobacteria?

a-Corynebacterium b-Streptomyces c- Bacillus
d- Mycobacterium e- Actinomyces

4- All of the following are true of the genus Mycoplasma except:

a- they are unusually small bacteria. b-they have rigid cell wall
c-they may produce filaments that resemble fungi. d-they are slime in appearance
e-they are pleomorphic

5- A bacterium isolated from the soil has the following characteristics: gram-negative straight rod, readily cultivated in some living tissues. Ribosomal RNA analysis places this bacterium with the alpha-proteobacteria. This organism is most likely in the genus:

a-Vibrio. b-Haemophilus c-Rickettsia
d-Ehrlichia e-Pseudomonas.

6- All of the following can form filaments except:

a- Actinomyces b Nocardia c - Borrelia
d- Mycoplasma e- Streptomyces

7- Archaea usually grow in a few restricted or specialized habitats, such as

a- anaerobic b- extremely hot c- hypersaline
d- extremely cold e- all of these

8- Methanogenic bacteria are archaea that are

a- strict anaerobes that obtain energy through the synthesis of methane.
b- strict anaerobes that obtain energy through the consumption of methane.
c- strict aerobes that obtain energy through the synthesis of methane.
d-both a & b. e-none of the above

9- Methanogens are potentially of great importance because

a- they produce methane. b- they consume methane.
c- methane is an excellent energy source. d- both a and c. e- both b and c

10- Extreme halophiles are found in

a- animal intestines b- salt lakes c- the Antarctic ice mass
d- Mouth e- none of the above

11- Microorganisms belonging to the same _____ would be expected to have the most characteristics in common with each other.

a- order b- kingdom c- species
d- family e- genus

12- A unicellular heterotroph with a nucleus but possess 70S ribosomes and lack golgi apparatuses should be placed in which kingdom

a- Fungi b- Eubacteria c- Archezoa
d- Chromista e- Animalia

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13- Which kingdom would an organism with the following characteristics most likely belong: true nucleus, non-photosynthetic, non-motile, absorb nutrients, and reproduce by forming spores?

a-fungi b-Eubacteria c-protista
d-plantae e- Animalia

14- What was one of the first and most useful microscopic tests for classifying bacteria that is still important today?

a- Gram stain b- flagella stains c- negative stain for capsule
d- metachromatic granule stain e- simple stain

15- Biochemical tests are used to determine

a- nucleic acid base composition. b- enzymatic activities. c- staining characteristics.
d- amino acid sequences e- All of the above.

16- Which of the following is the arrangement of organisms into groups or taxa?

a- nomenclature b- Identification c-classification
d-systematic e-phylogeny

17- Extensive sequential nucleotide analysis and analysis of rRNA has divided the living world into three domains called

a- bacteria, archaea and eucarya. b- procarya, eucarya and animals.
c- fungi, plants and animals. d- bacteria, archaea and cyanobacteria
e archaea, eucarya and viruses.

18-A classification system arranges organisms into groups whose members share many characteristics and reflects as much as possible the biological nature of organisms

a- artificial b- natural c- phylogenetic
d-molecular e-phenetic

19- All of the following are examples of morphological features used for classification and identification of procaryotes except

a- staining behavior. b- colonial shape and color.
c- endospore morphology and location. d- cell shape. e- fermentation products.

20- The use of two photosystems by cyanobacteria allow them to produce _____ from light.

a- ATP (energy) b- NADPH (reducing power for carbon fixation)
c- both ATP and NADPH d- H2S (for reverse electron flow)
e- ATP, NADPH and H2S

With my best wishes

Dr. Adel A. El-Morsi ***Dr. Ahmed El-Shobakey***