المستوى الرابع - حيوان كيمياء - سؤال صباحي ٢٠٩ ع

Mansoura University
Faculty of Science
Zoology Department
Subject: Zoology
Course: Cell Biology (Z- 409)

4th level Zoology & Chemistry
Date: 28/5/2013
Time Allowed: 2 hrs
Full Mark: (60 marks)

I) write (√) or (×): (15 marks, 1 mark each)

1) Disorders of hemidesmosomes may lead to cancer development. ( )
2) Adheren junctions are the attachment site for actin microfilaments. ( )
3) The cell extracellular matrix is made up only of proteoglycans. ( )
4) Cytoplasmic streaming is one of the main functions of actin microfilaments. ( )
5) Osmosis is the diffusion of electrolytes from an area of higher conc. to area of low conc. ( )
6) Disulphide bonds are essential for selectins to do their function of cell-cell adhesion. ( )
7) cAMP is considered as one of the lipophilic cell signaling 2_{nd} messengers. ( )
8) The blood tumor marker of Prostate cancer cells is PSA. ( )
9) Formation of Centrioles is one of the main functions of the cytoskeleton microtubules. ( )
10) Claudins are the major transmembrane proteins in occluding junctions. ( )
11) Ligand gated Na^+ channel is an example of indirect active transport. ( )
12) Lipid bilayer stabilization is the main function of the cell membrane cholesterol. ( )
13) Cystic fibrosis is a disease of Na^+ channel disease. ( )
14) Heat shock proteins are the main class of proteins involved in protein degradation. ( )
15) Ubiquitination is a multiple step process involved in lysosomal degradation of proteins. ( )

II) Choose the Right answer (10 marks, 1 mark each)

1) Binding of ..... to CdK2 is crucial for G1/S transition phase

a) Cyclin E b) Cyclin B c) Cyclin C d) Cyclin H

2) ..... is the type of cancer that affect embryonic tissue origin

a) Sarcoma b) Blastoma c) Carcinoma d) Mesothelioma

3) ..... is a chemical carcinogen that is responsible for mesothelioma.

a) Benzanthracene b) Arsenic c) Asbestos d) Benzopyrene

4) Which of the follows is considered as a marker of cancers of epithelial origin.

a) Vimentin b) LCA c) EMA d) NSE

5) ..... is the phase where the cells are quiescent (undividing cells)

a) S phase b) G1 phase c) G0 phase d) M phase

6) Nitric oxide induces smooth muscle relaxation by up-regulating the cellular level of .....

a) cGMP b) cAMP c) cATP d) cTTP

Continue.....

7) Signaling though gap junctions is an example of ..... signaling.

a) Synaptic b) Paracrine c) contact-dependant d) Endocrine

8) ..... is essential for endothelial cell survival.

a) E-cadherin b) N-cadherin c) VE-cadherin d) P-cadherin

9) ..... Is the main ligand of the cell receptor integrin.

a) Collagen b) laminin c) Cludins d) Fibronectin

10) Swelling of RBCs is an example of placing RBCs in ..... solution.

a) Hypotonic b) Hypertonic c) Isotonic d) Ringers'

III) Define each of the follows aspects: (5 marks, 1 mark each)

1) Integrins 2) Desmosomes 3) mechanically gated ion channel

4) Cyclin dependant kinases (CdKs) 5) Tight junctions

IV) Write short notes on <u>Three</u> of the follows: (30 marks, 10 marks each)

1) From your study of cell signaling elucidate how cells can response differently to the same stimulus
2) Cadherin as a cell adhesion molecule, involved in cell adhesion, survival and cancer development.
3) Ion channel related diseases.
4) The process of protein folding and elucidate how it is vital for protein functions.

Best Wishes *Prof. Sherif Abdeen* *Dr. Faried Abd el Qader*

Dr. F. Elsayad *Dr. Mohamed E. Abdraboh*

المستوى الرابع - كيمياء حيوية - كيمياء نباتية لـ ٤١٣

Mansoura University
Faculty of Science
Chemistry Department
Subject: Analytical Chemistry
Course Environmental Chemistry
Course code: CHEM 413.....

4thlevel(Chemistry,Botany and Biology students)
Date:**25-5-2013**
Time allowed: **2** hours
Full Mark:80 Marks

Answer the Following Questions:

1- Explain, with examples, the effect of toxic chemicals on enzymes. . (10marks)

2- Discuss the mechanism of action of insecticide (10 marks)

3- What is pollutant cycle? Illustrate such a cycle in the environment (10 marks)

4. Write short notes on **three** only of the following : (15 marks)

(a) Sanitary landfill method for waste disposal

(b) Incineration method of waste disposal

(c) Municipal waste composting

(d) The toxic effects of CO in the body. Is this effect reversible or irreversible? Does it act on enzyme system?

5- Define the following :

a) Heavy metals b) Chemical speciation c) BOD and DO

(15marks)

Best wishes,

Dr.I. Kenawy , Dr. M. Eldefrawy and Dr Weam Abo-Elmaty

المستوى الرابع - كيمياء حيوية - مناعة وبيولوجيا جزيئية ج ٢.٠

Mansoura University
Faculty of Science
Zoology Department
Courses: Immunology & Molecular Biology
Academic Year: 2012-2013

Second Term - Final Exam
4th Level Students
Date: 1 June, 2013
Time Allowed: 2 hrs
Full Mark: 60

Answer All Questions

Part I Immunology

Question 1 **(15 marks)**

Write short notes on:

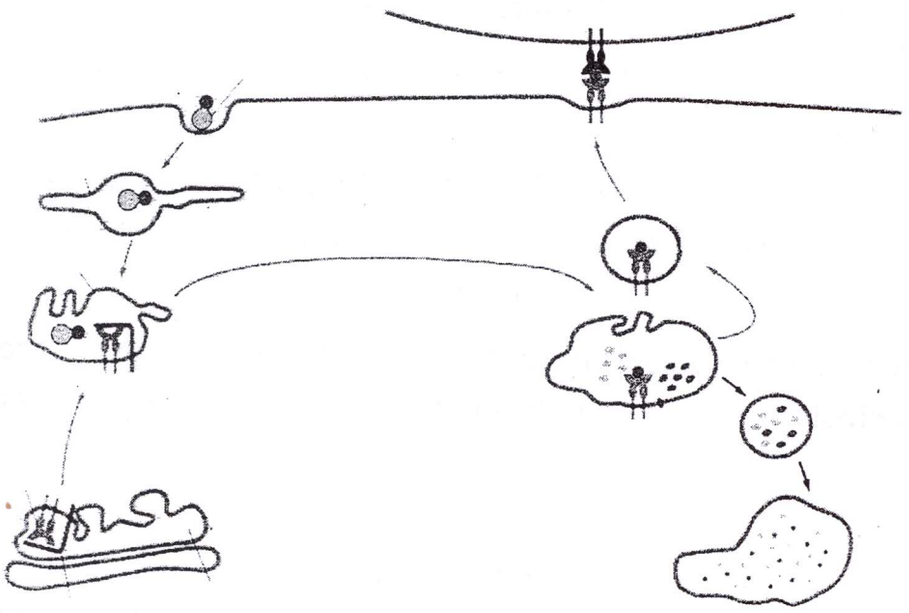
a) IgG.
b) Complement system.

Question 2 **(15 marks)**

A- Complete:

a) ..... region determines the specificity of the antibody, while ..... region determines its functional properties.
b) Antibody molecule has ..... antigen-binding sites.
c) ..... antibody has ten antigen-binding sites.
d) Helper T cells express ..... co-receptor, while cytotoxic T cells express ..... co-receptor.
e) Exogenous antigens are expressed to T_{helper} cells in the context of ....., while endogenous antigens are expressed to $T_{cytotoxic}$ cells in the context of .....

B- Identify, draw and put the labels for the following diagram:



Part II Molecular Biology

Q. 1: Discuss the Following Statements: **(20 marks, 5 Marks each)**

A: Restriction nucleases enzymes.

B: Bacterial plasmids and cloning DNA.

C: Transgenic animals carry engineered genes.

D: Compare between DNA and RNA.

Q. 2.: **(10 marks)**

A: Complete the following statements: **(5 marks, each statement of one Mark)**

1- Gel electrophoresis separates DNA molecules according to .....,.....and .....

2- The vector contains three characteristics regions.....,.....and .....

3- Expression vectors have transcriptional promoters immediately adjacent to the .....

4- Transformation is process by which a host organism can take up .....

5- Gel matrix are .....and .....

B- States whether true or false and give the reasons for your answer:

(5 marks, each statement of one Mark)

1. Transcription uses the transcribed RNA to synthesize proteins.
2. Semi-conservative Model, the parental double helix is broken into double-stranded DNA segments that, as for the Conservative Model, act as templates for the synthesis of new double helix molecules. The segments then reassemble into complete DNA double helices, each with parental and progeny DNA segments interspersed.
3. Exons can be as large as 100,000 bases in length, while Introns length is usually 100 to 300 nucleotides in length.
4. Meiosis is the name for the way that a cell duplicates itself so that each daughter cell receives an identical copy of its genetic material. At the end of mitosis, there will be two cells instead of one. They will be identical to each other.
5. The reproduction of some organisms contains a step when gametes are produced. This involves a cell division called meiosis. In an organism, the multiplication of cells is called mitosis.

Our best wishes

Prof. Sherif Helmy Abdeen **Dr: Sayed Kamel Areida**

المستوى الرابع كيمياء نبات - كيمياء الفاصرة بنقالوى لـ ٤٢٥
كيمياء حيوان

Mansoura University Faculty of Science Chemistry Department Subject: Chemistry (Chem. 425) Course(s): Inorganic Chemistry		Second Term 4th level chemistry/zoology & botany Date: 4/6/2013 Time allowed: 2 hours Full Mark: 80 Marks

Question:1

I. Write short notes on the following: **(16 marks)**

a. Magnetic properties of lanthanides.

b. Separation methods of lanthanides.

c. Actinides ores.

d. Nuclear criticality.

II. Complete the following equations: **(10 marks)**

a. $^{252}_{98}Cf + {}^{11}_{5}B \rightarrow \cdots\cdots + 5\ {}^{1}_{0}n$

b. $^{242}_{96}Cm + {}^{4}_{2}He \rightarrow \cdots\cdots + {}^{1}_{0}n$

c. $\cdots\cdots + {}^{4}_{2}He \rightarrow {}^{242}_{96}Cm + {}^{1}_{0}n$

d. $^{238}_{92}U + {}^{16}_{8}O \rightarrow \cdots\cdots + 4{}^{1}_{0}n$

e. $^{254}_{99}Es + \beta \rightarrow \cdots\cdots$

Question:2

I. Complete the following statement: **(14 marks)**

a. Cerium is act as a strong .....agent, while Europium is act as a strong ..... agent.

b. According to ....., the element with ..... atomic number is more abundant than that with ..... atomic number.

c. The regular decrease in the size of lanthanide ions is known as ....., this is due to greater effect of ..... than that of the .....

d. The transitions of the f-electrons are responsible for ..... properties of the lanthanide ions, such as ....., ... and .....

e. The actinide series contain the ..... elements with atomic numbers ..... through ....., from ..... through .....

f. Neodymium used in the manufacture of ..... for laser applications while, praseodymium used to create .....

g. Uraniumtrioxide is ..... magnetic with ..... colour while, uraniumdioxide is ..... with ..... colour.

من فضلك انظر في الخلف ◄

Question:3

I. On the basis of VBT predict the geometry & magnetic moment of these complexes: $[Fe(CN)_6]^{3-}$ & $[FeF_6]^{3-}$, then discuss the limitation of VBT. (10 marks)

II. Which complex of the following pairs has the larger value of Δ_o: (10 marks)

a. $[Fe(H_2O)_6]^{3+}$ & $[Fe(H_2O)_6]^{2+}$

b. $[Cr(H_2O)_6]^{2+}$ & $[Mn(H_2O)_6]^{3+}$

c. $[Co(H_2O)_6]^{2+}$ & $[Ni(H_2O)_6]^{2+}$

d. $[Pd(H_2O)_6]^{2+}$ & $[Pt(H_2O)_6]^{2+}$

e. $[Ni(CN)_6]^{3-}$ & $[CoCl_6]^{3-}$

Question:4

I. For the Co^{3+} ion, the electron pairing energy (P) is about 16,800 cm^{-1} & the crystal field splitting energy values (Δ_o) for the $[CoF_6]^{3-}$ & $[Co(NH_3)_6]^{3+}$ complexes are 13,000 cm^{-1} and 23,000 cm^{-1}, respectively.

a. Which of these complexes have high spin configuration?

b. Calculate the number of unpaired electron & the magnetic moment (μ_s) for each complex?

c. Calculate the CFSE for both complexes? (10 marks)

II. $[Sc(H_2O)_6]^{3+}$ complex is diamagnetic while, $[Ti(H_2O)_6]^{3+}$ complex is paramagnetic, explain this experimental observation using MOT. (10 marks)

At. No. [Sc = 21, Ti = 22, Cr = 24, Mn = 25, Fe = 26, Co = 27, Ni = 28, Pd = 46, Pt = 78]

Good Luck

Dr. Rania R. Zaky

المستوى الرابع - كيمياء - الكربوهيدرات - ك ٤٣٤
كيمياء صواب
كيمياء بنا

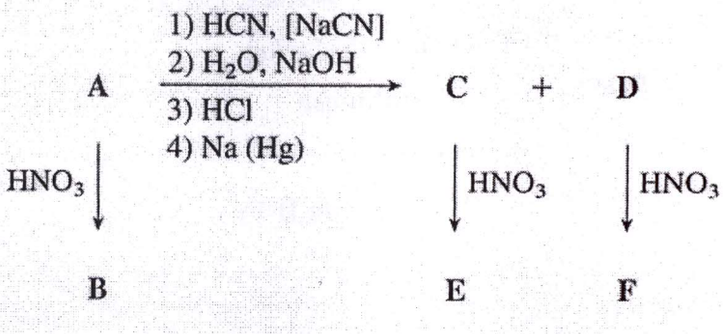
Mansoura University
Faculty of Science
Chemistry Department
El- Mansoura, Egypt

جامعة المنصورة
كلية العلوم
قسم الكيمياء
منصورة – مصر

Second Semester: Final Exam. 2013

Educational Year: Fourth Year
Course (s): Carbohydrates Chemistry — **Subject: Chemistry**
Date: 8 June/ 2013 — **Full Mark: 80**
Course Code: Chemistry 434 — **Time: 2 Hours**

1- a- Monosaccharide A in the following scheme is a D-aldopentose. Compound E does rotate plane-polarized light, wherease compound B and F do not. Show the structures of A, B, C, D, and E. [10 Marks]



b- Discuss the effect of Both Tosyl chloride and Periodic acid on Monosaccharide A. [10 Marks]

2-a- Explain by equation conversion of D-arabinose to higher aldose & ketose. [5Marks]

b- Starch is a polysaccharide contains amylose and amylopectin used for energy storage in plant.

i-Describe the type of glycosidic bond in it. [5Marks]

ii-What the effect of both HNO_3 and trityl chloride on aldose-monosaccharide units obtained by hydrolysis of starch. [5Marks]

c- Sucrose and Lactose are disaccharides; which of them does not undergoes Mutarotation? [5Marks]

3- The Following disaccharides consisting of two monosaccharide units:

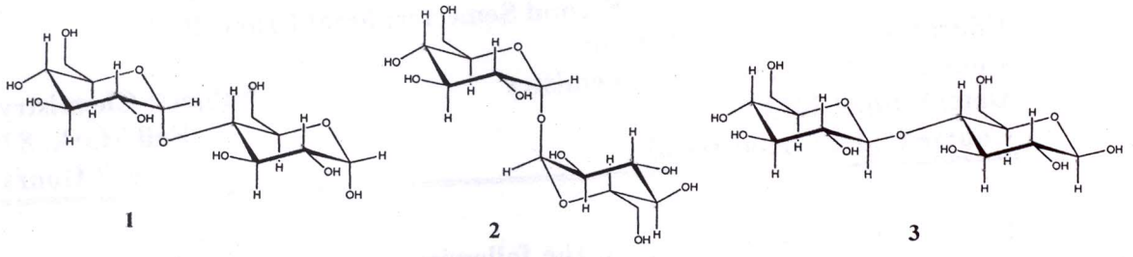
i- Draw the Fisher projection and Haworth formulation of the hydrolyzed monosaccarides of compound 2. [5Marks]

ii- Which of these disaccharides has reducing power (explain by equations in compound 3). [5 Marks]

P.T.O

iii - Elucidate the Point of attachment in compound 1. [5Marks]

iv- Describe the type and point of attachment of each glycosidic bond in all disaccharides. [5Marks]



1 **2** **3**

4- a- Explain by equation, how you can proof of glucose stereochemistry. [5Marks]

b- Determine the structure of lactose. [5Marks]

c- Convert of the following: [5Marks]

i- D-Ribose to D- arabinose

ii- Glucose to Fructose

d- Formation of osatriazole from D-Fructose. [5Marks]

Best regards,

Prof. Dr. Wafaa S. Hamama & Dr. Mona El-Sayed

Mansoura University
Faculty of Science
Chemistry Department
Chem446

May 2013
4th Level,Chem. Botany
Time Allowed: 2 hrs
Full Mark: 80Marks

Answer the following questions:

Section 1(catalysts&catalysis)

1- Discuss the following:- *(10 marks)*

a- Catalyst activity and selectivity

b- Deactivation of catalyst

c- Autocatalysis

d- Specific acid catalysis

2- Derive the equation rate of enzyme catalysis. *(10 marks)*

3- Vm for an enzymatic reaction is 5 µmol per minute when 2 µg of an enzyme whose molecular weight is 27.000 is present.

What is the turnover number? *(5 marks)*

4- What is the rate equation of the following, *(5 marks)*

$$A+B+C \leftrightarrow ABC$$

$$ABC \rightarrow P+C$$

5- Discuss the effect of the catalyst on a reversible reaction *(5 marks)*

6- Define the nucleophilic and electrophilic catalysis. *(5 marks)*

Section II (colloids)

I) **(a) Complete the following:** (4 marks)

A silver iodide sol AgI is stabilized by a small excess of KI, the particles are ..... Charged. The attached ..... ions constitute the inner portion of the double layer are called ..... ions and the ..... ions the outer layer are called.

(b) **Discuss three only of the following:** (18 marks)

(i) The procedure adobted for the determination of gold number.

(ii) Electrodialysis.

(iii) Emulsifier.

(iv) Two methods for preparation of sol.

(v) Sedimentation by gravity.

(فضلا اقلب الصفحة)

II. (a) Tick (√) on the correct answer: (4marks)

The viscosity of hydrophobic sol is:

- Equal the viscosity of the dispersion medium. ( )
- Greater than that of the dispersion medium. ( )
- Less than that of the dispersion medium. ( )

(b) Give reason on two only of the following: (10marks)

i) Agglomeration of sols.

ii) Tyndall effect of a colloidal solution.

iii) Many colloidal systems are colored.

(c) Define: (4marks)

i) The dispersity of the system

ii) Salting out

iii) Negative adsorption

Mansoura University
Faculty of Science
Chemistry Department
Subject: Electrochemistry

Date :June 2013
Code : Chem. 341
Full Mark : 60
Time Allowed : 2hours

Answer All Questions

First Question : (20 Mark)

[A] Write with examples on : (12 Mark)

(i) Metal- Metal ion electrode. (ii) Amalgam electrode.

(iii) Gas electrode. (iv) Metal-insoluble salt electrode.

[B] For the cell : Pt / HCl / Ag/AgCl (8 Mark)

(i) What is the type of the cell and why? (ii) Determine the emf of the cell.

(iii)Use this cell for determination the standard electrode potential of Ag/AgCl electrode

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Second Question : (20 Mark)

Discuss in detail :

[A] Decomposition potential. (10 Mark)

[B] Electrode kinetics for reversible electrode . (7 Mark)

[C] Sulphation . (3 Mark)

Third Question : (20 Mark)

[A] Give reason : (8 Mark)

(i) Dry cell is irreversible cell . (ii) E^{o} for concentration cell is zero.

(iii) The maximum emf obtainable from a simple cell is 2 V.

(iv) Use of glass electrode is the most convenient method for measuring solution pH.

[B] What is the difference between chemical cell and concentration cell. (3 Mark)

[C] Write on electrode concentration cell without transference. (5 Mark)

[D] Complete : (4 Mark)

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

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

and .....

Good Luck

Prof.Dr. Ahlam M.A.Helmy

المستوى الرابع - كيمياء حيوان . فسيولوجي (ج) ٢٠١٣-٢٠١٤

Mansoura University
Faculty of Science
Zoology Department
Subject: Zoology (Z 406)
Courses' Physiology(2)

Second Term
4th Level: Chem.&Zool.
Date: 15-6-2013 السبت
Time Allowed: 2hr
Full Mark: (60)

Answer all Questions: Each Question [20] Mark

[1] Answer as shown in brackets: (20 marks)

1- Neuroglia (types and origin)
2- Hydrogen ion secretion in renal tubules (show the equation).
3- Myelinated nerve fiber slower than unmyelinated nerve fiber in nerve impulse transmission. (True of false, why?)
4- Action potential (Identify)
5- Formation of urea or uric acid from NH3 (Mention the main enzymes in these process)
6- Intercalated disc (its importance)
7- Hormones affect reabsorption process from the nephron. (Mention 2 only)
8- Troponin (Illustrate 2 types and importance of each)
9- Synapses (different types)
10- The ECG waves in cardiac cycle comprises --------- , ---------- and --------- (complete and draw)
11- The relation between strength and duration is --------- (equal – inversly – directly proportional) (choose the correct answer)
12- Interlober artery divide to give ---------- (complete)
13- Junctional fold (their importance)
14- The heart beat is about ----------/ minute (complete)
15- Neurotransmitters (mention 3 types)
16- Glutamic acid is transferred to α-ketoglutaric acid with the release of ------- (H, PO4, NH3) (choose the correct answer)

[2]A- Briefly illustrate FOUR of the following: (10 marks)

1- Physiology of smooth muscle.
2- Mechanism of synaptic transmission.
3- Structural functional adaptation of the kidney.
4- Compare between slow and fast muscle
5- Types of ion channels.

B- Discuss FOUR only of the following: (10 marks)

1- Fate of erythrocytes
2- Oxygen dissociation curve and the factors affecting it.
3- Dietary factors affecting erythrpoiesis.
4- Two methods of plasma protein separation.
5- Steps of hemoglobin synthesis

[3] A- choose the correct answer: (12marks)

1- Which of the following organs produce all plasma proteins except the γ- globulins?
a- kidney b- liver c- spleen d- small intestine

2- Antibody B is present in the blood plasma of individuals with blood ----------
a- types A and O b- type B c- types B and A d- types B and O

3- Anemia can be caused by all of the following except ----------
a- nutritional deficiency of vitamin B12 and iron b- hypoxia from smoking or air pollution
c- kidney failure d- failure of gastric production of intrinsic factor

4- During intrauterine life, formation of the RBCs begins in ---------
a- bone marrow b- liver c- spleen d- mesoderm of yolk sac

5- Reticulocyte is immature ----------
a- RBC b- WBC c- platelet d- albumin

6- Hypoxia induces the kidney to produce ---------- , which stimulates the production of ----------
a- platelets ; RBCs b- erythropoietin ; RBCs
c- Fibrinogen ; WBCs d- erythropoietin ; platelets

7- ---------- are the most numerous WBCs , an active phagocytes that increases rapidly during acute infections?
a- monocytes b- eosinophils c- neutrophils d- lymphocytes

8- The process by which WBCs move into and out of the blood vessel is called ----------
a- phagocytosis b- passive transport c- endocytosis d- diapedesis

9- Which sequence is correct for the following events?
1- formation of thromboplastin 2- clot retraction
3- fibrinogen ⟶ fibrin 4- prothrmbin ⟶ thrombin
a- 1,2,3,4 b- 3,4,1,2 c- 1,4,3,2 d- 3,2,1,4

10- An anemic subject has RBCs count 3.5 million/mm, PVC 42% and Hb 14gm%, by using the blood indices this subject most probably has ---------- anemia. Explain why? (2 marks)
a- aplastic b- macrocytic hyperchromic
c- normocytic normochromic d- microcytic hypochromic

B- Identify THREE only of the following: (3 marks)
i- Megakaryocytes ii- Carboxyhemoglobin iii- Erythrpoietin
iv- Tidal CO_2 v- HbF

B- Fill in the blanks: (5 marks)

1- Two types of granulocytes are --------(1)-------- and -------(2)--------
2- Decreased plasma albumin results from:
i- -------(3)------- example -----(4) --------
ii- ------(5) ------ example ------(6)--------
3- Two functions of erythrocyte membrane are: ---------(7)--------- and ------(8)---------
4- Hematocrit value is used in : --------(9) ----------, ----------(10)----------
5- Two main factors affecting blood viscosity are: ----(11)-------, -----(12)-------
6- The indicator substance used in the measurement of body fluids must be:
----------(13----------, ----------(14)----------
7- From the general functions of the blood, it regulates: -------(15)-------, -------(16)----------

Prof. Dr. Gamal Edrees Dr. Elsayed M. El-Habibi

المستوى الرابع - كيمياء صيدى - كيمياء حيوية - كيمياء البيئة - كيمياء البترول ك ٢٨

Mansoura University
Faculty of Science
Chemistry Department
Subject: Polymer & Environmental Chemist

First Term
4th Year: General Student
Date: May 2013
Time allowed: 2 h
Total Marks: 60 marks

Answer the following questions:

1- Compare between each of the following: (15 marks)

a - Thermoplastic and Thermoset polymers.
b- Alternating, Graft and Block copolymers.
c- Isotactic, Syndiotactic and Atactic polymers.
d- Chain-growth and Step-growth polymerization.
e- Linear, Branched, Network, Star and Dendrimers polymers.

2- Write short notes on the different types of initiators generally used in free radical Polymerization. Then select one of them suitable for illustrating the mechanism of polymerization of *styrene* monomer. (15 marks)

3- a) In polymerization of phthalic and ethylene glycol, although we get 80% degree of conversion we didn't obtain a polymeric material. Explain. (8 marks).

b) Derive a mathematical expression for the kinetics of free radical polymerization (7 marks).

4- a) Compare between cellulose, chitin and chitosan (7 marks).

b) By chemical equations, illustrate how to prepare polyvinyl alcohol and polyvinyl amine. (8 marks).

With our best Wishes

Examiners:

Dr. Dalia Mokhtar Ayad and Dr. M. Monier