كلية العلوم – جامعة كفر الشيخ

الفرقة الرابعة- نظم النمذجة و المحاكاة - تاريخ الامتحان١٢/٦/ 2016

اجب عن التالي- الدرجة من 70 – كل سؤال 10 درجات

1- write an algorithm to sort the next data using bubble sort and hash sort

1 23 2 56 9 8 10 100

Apply radix sort algorithm and tree sort algorithm to find the sorted data for the above data

2-generate 10 random numbers between 0,1. Transform these numbers to be between 100, 500, write a program to generate 1000 numbers between 100, 500

3- find average service time , arrival time, completion time and waiting time for the next customer sample using FCFS:

Customer number	1	2	3	4	5	6
Arrival time	0	4	6	7	12	16
Service time	5	30	15	12	10	8

find average completion time and waiting time if the system uses 2 independent servers.

4-- find average service time , arrival time, completion time and waiting time for the next customer sample using SEFS policy.

Customer number	1	2	3	4	5	6
Arrival time	0	4	6	7	12	16
Service time	5	3	4	2	10	8

5- find average service time , arrival time, completion time and waiting time for the next system using priority sample, high priority is first serviced HPFS, using pre-emptive service:

Customer number	1	2	3	4	5	6
Arrival time	0	4	6	7	12	16
Service time	5	30	4	20	10	8
priority	5	3	4	2	8	6

6- find average service time , arrival time, completion time and waiting time for the next system using 2 sequenced servers, find idle time for servers.

Customer number	1	2	3	4	5	6
Arrival time	0	4	6	7	15	16
Service time1	5	30	4	20	10	8
Service time2	5	3	14	2	8	6

7- write algorithm to search for element x= 25, in the next data keys

1 , 23 , 2, 56, 75 , 9 , 8 ,10, 100, 25, 88, 44, 12

Find complexity of algorithm

Solve the following problems:

1- (a) Use the least square approximation to fit a straight line to the following data:

x	1	2	3	4	5	6
Y	120	90	60	70	35	11

(b) Use the least square approximation to fit a straight line to the function $(y = \sqrt{x})\ over\ 0 \le x \le 1$.   (20)

2-(a) Show that the system $(1, \cos x, \sin x, \cos 2x, \sin 2x, ...)$ is orthogonal over the interval $[-\pi, \pi]$.

(b) Use the following equation:

$$p_{n+1}(x) = (\frac{2n+1}{n+1})xp_n(x) - (\frac{n}{n+1})p_{n-1}(x), p_0(x) = 1, p_1(x) = x$$

To find $p_5(x)$.   (20)

3- (a) Use the function: $T_n(x) = \cos(n \cos^{-1} x), -1 \le x \le 1, n \ge 0$ to prove that

$$T_{n+1}(x) = 2xT_n(x) - T_{n-1}(x), n \ge 1$$

(b) Convert the first 5 terms of the Taylor series expansion for e^x into a Chebysheve polynomial .   (20)

4- Solve : $u_{xx} + u_{yy} = 0; u(x,0) = 1, u(0, y) = 0, u(x,1) = 1, u(1, y) = 0$

and $0 \le x \le 1, 0 \le y \le 1$ (Take h=k=1/3).   (10)

مع أطيب أمنياتي بالنجاح ،،،   أ.د / محمد لطفي

Exam for Academic year 2015/2016

Answer the following questions:

1- Complete the following:

   a- During photolysis process, free radicals are formed by heterolytic fission of the bond.

   b- An electronic transition takes place with ± 1 change of electron spin.

   c- On a potential energy diagram electronic transitions occur vertically.

2- Discuss each of the following:
   a- Born – Oppenheimer approximation.
   b- Franck – Condon principle.
   c- Bond order and IR spectroscopy.
   d- Stokes Shift.

3- In the figure:
   a- Label the vibrational energy levels.
   b- Draw both the electronic absorption and emission diagram energy.
   c- Draw both the maximum absorption and emission peaks.

4- Discuss the reaction between halogen and hydrocarbons in presence of light.
Cl_2 + RH + light →............

5- Compare between both IR and Raman spectroscopy.
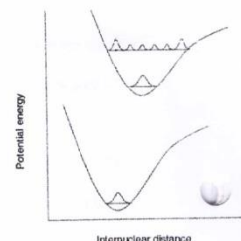
With my best wishes

Dr. Hamdy El-Sheshtawy

Kafr Elsheikh University

Faculty of Science

Zoology Department (4th year)

(70 Marks)

Final Exam of Cell Biology 2015-2016

Time (2 hours)

Answer the following three questions (4 pages)

A-Choose the one best answer *   (30 Marks)

1- The term "nuclear envelope" is more correct than the term "nuclear membrane" because:

a.   The enclosure has pores which membranes do not.
b.   The enclosure is made up of two membranes
c.   The chemical composition is inconsistent with cellular membranes
d.   None of the above. The two terms are perfect synonyms.

2- Which of the following is NOT correctly paired?

a.   Rough endoplasmic reticulum--protein synthesis
b.   Smooth endoplasmic reticulum--lipid synthesis
c.   Golgi apparatus--processing, packaging, secretion
d.   lysosome--production of ATP
e.   Nucleus--cellular reproduction

3- The rough endoplasmic reticulum functions in

a.   Transport, respiration, and synthesis
b.   Contraction, transport, and diffusion
c.   Synthesis, storage, and transport
d.   Storage, transport, and digestion

4- What is the correct organelle sequence for the export of material out of a cell?

a.   Smooth ER --> Golgi apparatus --> rough ER
b.   Smooth ER --> rough ER --> Golgi apparatus
c.   Rough ER --> smooth ER --> Golgi apparatus
d.   Rough ER --> Golgi apparatus --> smooth ER

5-Lysosomes are vesicles formed by the.

a.   Mitochondria   b.   Nucleus   c.   Ribosomes
d.   Golgi apparatus   e.   endoplasmic reticulum

1

Kafr Elsheikh University

Faculty of Science

Zoology Department (4th year)   **(70 Marks)**

Final Exam of Cell Biology 2015-2016   **Time (2 hours)**

Answer the following three questions (4 pages)

A-Choose the one best answer *   (30 Marks)

1- The term "nuclear envelope" is more correct than the term "nuclear membrane" because:

a.   The enclosure has pores which membranes do not.
b.   The enclosure is made up of two membranes
c.   The chemical composition is inconsistent with cellular membranes
d.   None of the above. The two terms are perfect synonyms.

2- Which of the following is NOT correctly paired?

a.   Rough endoplasmic reticulum--protein synthesis
b.   Smooth endoplasmic reticulum--lipid synthesis
c.   Golgi apparatus--processing, packaging, secretion
d.   lysosome--production of ATP
e.   Nucleus--cellular reproduction

3- The rough endoplasmic reticulum functions in

a.   Transport, respiration, and synthesis
b.   Contraction, transport, and diffusion
c.   Synthesis, storage, and transport
d.   Storage, transport, and digestion

4- What is the correct organelle sequence for the export of material out of a cell?

a.   Smooth ER --> Golgi apparatus --> rough ER
b.   Smooth ER --> rough ER --> Golgi apparatus
c.   Rough ER --> smooth ER --> Golgi apparatus
d.   Rough ER --> Golgi apparatus --> smooth ER

5-Lysosomes are vesicles formed by the.

a.   Mitochondria   b.   Nucleus   c.   Ribosomes
d.   Golgi apparatus   e.   endoplasmic reticulum

1

جامعة كفر الشيخ -كلية العلوم
قسم الرياضيات
الفرقة الرابعه : رياضيات
رمز المقرر: MATH 871
الدرجة: ٧٠ درجه

الاختبار النهائي الفصل الدراسي
الثاني ٢٠١٦-٢٠١٥م
المادة : نظرية الاشكال
التاريخ: الأحد ١٩ / ٦ / ٢٠١٦ م
الزمن : ١٢-٩

Solve the following questions:

Question (1)   (14 Marks)

a-Draw the graph of the divisors of 72 and find the following:

- i- Determine its type
- ii- Find a sub-graph on it
- iii- Find the order and the size of this graph
- iv- Is the graph connected or not (why).

b-Prove that every graph has an even number of vertices of odd degree.

Question (2)   (16 Marks)

a- Show that the complement of a simple graph G which is not connected is connected.

b-Give the implication between walk, trail and path. Is the converse true or not.

Question (3)   (18 Marks)

a-If G_1 , G_2 are any two graphs, show that by examples $G_1 \Delta G_2 = (G_1 \cup G_2) - (G_1 \cap G_2)$.

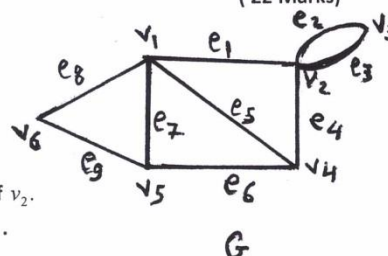b-Find the relation and give examples between the following:

- i- Regular and complete graphs
- ii- Graph and diagraph
- iii- Simple and complete graphs

Question (4)   (22 Marks)

a-If G is a graph find the following:

- i- The length of the walk
- ii- The components of the graph G
- iii- The complement of it
- iv- The open and the closed neighbourhood of v_2.
- v- The sum of the degree of the vertices of G .

b-If $X = \{1,2,3\}$, find the following:

- i- Draw the graph of $(P(X), \subseteq)$
- ii- Determine the kind of this graph
- iii- Find a tree and a spanning tree on it
- iv- Find a cut vertex on this graph.

End Questions
Best regards
Prof. Dr. Ahmed EL-Maghrabi

Kafrelsheikh University		Organic Synthesis (2)
Faculty of Science		Fourth Level
Chemistry Department		2 hours – 70 mark

I. **Explain the mechanism of the following reactions (write the reaction equation in each case) (answer only 4 from 5) (24 marks).**

1. One mole of benzaldehyde reacts with one mole of HCN to form **A**, which in turn reacts with another one mole of benazaldehyde to form compound **B**.

2. One mole of acetaldehyde reacts with three moles of formaldehyde in the presence of NaOH to give 3-hydroxy-2,2-bis-hydroxymethyl-propionaldehyde.

3. 1,3-Dithiane reacts with 1-bromo-3-methyl-2-butene in the presence of n-butyl lithium to form **A**, which in turn reacts with HCl/H_2O in the presence of Hg^{+2} to form **B**.

4. Reaction of methyl vinyl ether with buteraldehyde in the presence t-C_4H_9Li followed by acid hydrolysis to give 4-hydroxy-2-heptanone.

5. Pyrrole reacts with MeMgBr to form compound **A**, which in turn reacts with carbon dioxide followed by acid hydrolysis to form compound **B**.

II. **Answer the following questions (write the reaction equation in each case) (answer only 4 from 5) (22 marks).**

1. Explain the carbanion and why the following compounds give stable carbanion: nitromethane, cyclopentadiene and cyclooctatetrane.

2. Explain by equation why enol-forms are more stable than keto-forms in the following compounds: Ethyl acetoacetate, butan-2,3-dione, pentan-2,4-dione, and cyclopentan-1,2-dione.

3. Explain the mechanism of the conversion of phenol into salicylaldehyde (Reimer-Tiemann reaction).

4. Write the mechanism of the reaction of formaldehyde with 2-butene to give 4,5-dimethyl-1,3-dioxane.

5. Write the reaction mechanism of the reaction of PhLi with CO_2 to give benzophenone.

III. **Complete the following reactions (write the reaction equation in each case) (answer only 4 from 5) (24 marks).**

1. $(CH_3)_2CO$ + CH_3MgBr →   A
   A   + H^+ →   B

2. Oxirane   + H^+ →   A
   A   +   BuMgBr   →   B
   B   + H^+ →   C

3. $(CH_3)_2CO$ + OH^- →   A
   A   + $(CH_3)_2CO$ →   B
   B   +   HOH   →   C
   C   + $(- H_2O)$ →   D

4. $(CH_3)_3C!$ + $AlCl_3$ →   A
   A   + $H_2C=CH_2$ →   B
   B   + $AlCl_4^-$ →   C

5. HCHO   + H^+ →   A
   A   + $PhCH=CH_2$ →   B
   B   +   HOH   →   C
   C   +   HCHO   →   D

Good Luck ………… Prof. Dr. Ahmed I. Khodair

I. **Explain the mechanism of the following reactions (write the reaction equation in each case) (answer only 4 from 5) (24 marks).**

1. One mole of benzaldehyde reacts with one mole of HCN to form **A**, which in turn reacts with another one mole of benazaldehyde to form compound **B**.

2. One mole of acetaldehyde reacts with three moles of formaldehyde in the presence of NaOH to give 3-hydroxy-2,2-bis-hydroxymethyl-propionaldehyde.

3. 1,3-Dithiane reacts with 1-bromo-3-methyl-2-butene in the presence of n-butyl lithium to form **A**, which in turn reacts with HCl/H_2O in the presence of Hg^{+2} to form **B**.

4. Reaction of methyl vinyl ether with buteraldehyde in the presence $t\text{-}C_4H_9Li$ followed by acid hydrolysis to give 4-hydroxy-2-heptanone.

5. Pyrrole reacts with MeMgBr to form compound **A**, which in turn reacts with carbon dioxide followed by acid hydrolysis to form compound **B**.

II. **Answer the following questions (write the reaction equation in each case) (answer only 4 from 5) (22 marks).**

1. Explain the carbanion and why the following compounds give stable carbanion: nitromethane, cyclopentadiene and cyclooctatetrane.

2. Explain by equation why enol-forms are more stable than keto-forms in the following compounds: Ethyl acetoacetate, butan-2,3-dione, pentan-2,4-dione, and cyclopentan-1,2-dione.

3. Explain the mechanism of the conversion of phenol into salicylaldehyde (Reimer-Tiemann reaction).

4. Write the mechanism of the reaction of formaldehyde with 2-butene to give 4,5-dimethyl-1,3-dioxane.

5. Write the reaction mechanism of the reaction of PhLi with CO_2 to give benzophenone.

III. **Complete the following reactions (write the reaction equation in each case) (answer only 4 from 5) (24 marks).**

1.
$(CH_3)_2CO$	+	CH_3MgBr	$\rightarrow$	A
A	+	H^+	$\rightarrow$	B

2.
Oxirane	+	H^+	$\rightarrow$	A
A	+	BuMgBr	$\rightarrow$	B
B	+	H^+	$\rightarrow$	C

3.
$(CH_3)_2CO$	+	OH^-	$\rightarrow$	A
A	+	$(CH_3)_2CO$	$\rightarrow$	B
B	+	HOH	$\rightarrow$	C
C	+	$(- H_2O)$	$\rightarrow$	D

4.
$(CH_3)_3Cl$	+	$AlCl_3$	$\rightarrow$	A
A	+	$H_2C=CH_2$	$\rightarrow$	B
B	+	$AlCl_4^-$	$\rightarrow$	C

5.
HCHO	+	H^+	$\rightarrow$	A
A	+	$PhCH=CH_2$	$\rightarrow$	B
B	+	HOH	$\rightarrow$	C
C	+	HCHO	$\rightarrow$	D

Kafrelsheikh University
Faculty of Science
Zoology Department
Fourth level (Zool.)
Second Term 2015/2016

Time: 2h
Subject: **Immunology and Molecular Biology**
Total Marks: 100 (70 Written, 10 Oral, 20 Practical)
Date: 28/5/2016
Exam in one page

Answer the following questions with drawing whenever appropriate:

1st Immunology   35 marks

Write short notes on the following

1. Structure of Major Histocompatibility Molecules (MHC I & II) and their role in immune response.   **15 marks**

2. Immunogen and factors influencing immunogenicity.   **10 marks**

3. General structure of antibody molecules and mention the different antibody classes. **10 marks**

2nd Molecular Biology   35 marks

4. Compare between: 20 marks

   A. Properties of Microorganisms.

   B. Lac operon and Tryp operon in gene expression control.

   C. Enveloped and naked viruses.

   D. Multilevel of gene expression regulation in Eukaryotes.

5. Give brief descriptions of: 15 marks

   A. Mechanism of lytic viral infection.

   B. Problems that virus must solve and strategies for virus survival during infection.

   C. Transcription factors.

Best wishes,

Prof. Dr. Said Amer & Prof. Dr. Magdy Mahfouz

ANSWER THE FOLLOWING QUESTIONS

1. What are the main global tectonic events affected on geology of Egypt.   (10 marks)

2. Write with illustration in the Gulf of Suez Rift model.   (15 marks)

3. From this map: what are the total regional

magnetic trends along Red sea and

Gulf of Suez from N 26° to N 30°?.   (10 marks)
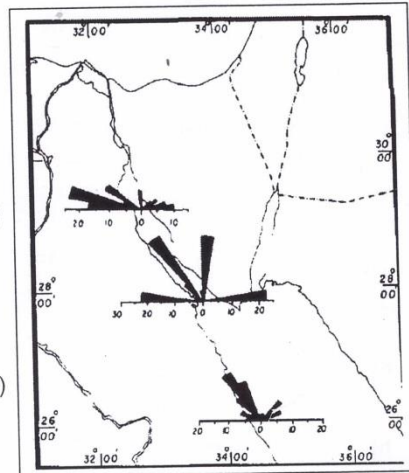
4. Give a reason for the following statements

(Write a very short answer):   (15 marks)

a). The occurrence of late Oligocene-early Miocene magmatic events in NE of Egypt.

b). The Mozambique Belt is more affected by collisions relative to Arabian Nubian Shield.

c). The Eustatic sea level changes from place to another.

d). There is a transition in magma types from alkaline in the Late Cretaceous -Early Tertiary to tholeiitic basalt in later Tertiary.

e). The Red Sea Rifting is considered an active rifting.

5. Complete the following statements   (20 marks)

a). The two possible primary dynamic forces that could initiate the Suez rift are either ....or......................

b). Closing of Mozambique Ocean during terminal collision between East and West .... continent to form the .... Orogen.

Kafrelsheikh University			Time:	2h
Faculty of Science			Subject:	Tectonics of Egypt (G439)
Geology Department			Total Marks: 70	
Fourth level (Geol.)			Date:	25/5/2016
Second Term 2016			Exam in two pages	

c). During late Cretaceous to Paleocene (90-50 M.Y), the right-lateral transcurrent between Africa and Laurasia resulted in two main tectonic elements such as................................... and.................................

d). In general, younger phase or later active rifting is along ....of the Gulf of Suez, but the initial rifting or early rifting is along ....

e). The northern Africa may be regarded as having been under a regional east-northeast extension from mid-Tertiary to present times; this leads to formation of .... and.....................................trends.

f). East African Orogen is subdivided into ....shield in the north and ....in south comprising mostly pre-Neoproterozoic crust.

g). The numbers of transform faults along Northern Red Sea are..................faults with..............trending

h). During late Jurassic to early Cretaceous (135 M.Year), a left lateral megashear between Africa and Laurasia leads to two main tectonic elements such as..and........................

i). The oldest rocks in Uweinat Mountains in Western Desert of Egypt are divided into two Series such as..............................and ....

j). Middle-upper Jurassic deposits such as Khatatba and Masajid formations show a strong ....trend that named.................trend

THE END

BEST WISHES FOR ALL

Prof.Dr. Mohamed Z. Khedr

Kafr El-Sheikh University

Faculty of Science

Chemistry Department

Fourth year student (Chemistry)

Polymer

(2016)

Time allowed 2 hr

Answer the following questions:

1] Write the mechanism of the free – polymerization through intitiation , propagation and termination .

[2] **write a short notce about :-**

  (a) Vulcanization of rubber .

  (b) Cationic and anionic exchange resin and it's use in the purification of weast water .

  (c) Anionic polymerization with sodium metal as initiator .

  (d) Cationic polymerization of using $AlCl_4$ as a lewis acid .

[3] **Comparesion between the following :-**

  (a) Emulsion and solution polymerization .

  (b) Nylon 6 and nylon 66 polyamide .

  (c) Polycarbonate and polyester .

  (d) Ionic free radical & polycondensation polymerization.

GOOD LUCK

First question: (10 marks)

Choose the correct answers for the following statements:

1- The resistivity of a metal ρ equals 3.2×10^{-7} Ω. m, the concentration of electrons $n= 5.2\times10^{28}$ m^{-3}, so the mobility of electrons in (m/v.s) equals

a – 5.7×10^{-4} b- 3.7×10^{-4} c- 7.5×10^{-5} d – 5.7×10^{-3}

2- A current density $J=2\times10^5$ A/m^2 passes in x direction through sheet of material with thickness 2mm, the normal magnetic flux density B =1.5 Tesla, if Hall voltage equals 0.22 μv, the concentration of charge carriers in m^{-3} equals

a- 8.5×10^{28} b- 1.7×10^{28} c- 8.5×10^{16} d – 8.5×10^{34}

3 - In Ga As with $\sigma = 10^6$ (Ω .m)$^{-1}$, $\mu_h = 0.45$, $\mu_n= 0.85$ m /V.s, the concentration of charge carriers n_i equals

a - 2.08×10^{-19} b – 4.8×10^{24} c – 4.8×10^{21} d – 5.7×10^{12}

4 - If Debye Temperature $\Theta_D=335$ k so the maximum frequency of the lattice is

a- 3.6×10^{12} Hz   b- 2.1×10^{12} Hz   c- 4.4×10^{13}Hz   d- 3.5×10^{14}Hz

5 - The maximum frequency of the mono atomic lattice with $a= 5A^0$ and the velocity of waves propagated through it $= 3\times10^5$ cm/s

a - 3×10^{12} b- 7×10^{12} c- 9×10^{12} d- 5×10^{12}

Essay questions

Second question: (20marks)

1- From the dispersion relation for diatomic lattice

$$\omega^2 = (\frac{1}{M} + \frac{1}{m})\mu \pm \mu\sqrt{(\frac{m+M}{mM})^2 - \frac{4\sin^2 ka}{mM}}$$

Find the frequencies of acoustic and optical branches and draw the dispersion curve, illustrate the forbidden and Brillion zone region.

2- If you know the following

$$\omega_D = (6n\pi^2)^{\frac{1}{3}}V_s \quad \text{and} \quad \bar{u} = 9RT(\frac{T}{\theta_D})^3 f(\frac{\theta_D}{T})$$

Find C_v at high and low temperature in Debye model.

Third question: (20 marks)

1-NaCl crystal absorbs infrared at wavelength = 50 μm calculate the lattice constant if the elasticity modulus E= 5x10^{11} dyne/cm^2

2-From the dispersion relation of mono atomic lattice $\omega = \omega_m \sin\frac{ka}{2}$

Deduce   a- the ω_{max} and λ_{min} b- the lattice frequency when $\omega \ll 1$.

The fourth question(20 marks)

1 - Prove that Fermi level in intrinsic semiconductors lies in the mid distance between C.B and V.B.

2- In quantum theory of free electron, prove that the energy level of electron is given by

$$E = \frac{n^2 h}{8mL^2}$$

Answer the following questions

1- Discus the time-independent of perturbation theory.

2- If it was

$$J^2 \psi_{j,m_j} = h^2 \, j(j+1)\psi_{j,m_j} \,,$$

$$J_z \psi_{j,m_j} = h \, m_j \, \psi_{j,m_j}$$

Prove that:

$$j = 0,\frac{1}{2},1,\frac{3}{2},\ldots\ldots$$

$$m_j = -j, 1-j, 2-j, \ldots, 0, \ldots j-2, j-1, j$$

$$-j \le m_j \le j$$

3- If S_x, S_y, S_z **is the components of the spin angular momentum in the direction of axis** ox, oy, oz **respectively.**

Prove that:

I) $S_x^2 = S_y^2 = S_z^2 = \dfrac{1}{4} h^2$

II) $S_- \, \alpha = \dfrac{1}{2} h \beta \,, \qquad S_+ \, \beta = h \alpha$

4- If the component of the angular momentum $\overline{L}$ **in axis** ox, oy, oz **is** L_x, L_y, L_z.

Prove that:

$$[L_x, r^2] = 0 \,, \quad [L_y, r^2] = 0 \,, \quad [L_z, r^2] = 0$$

With my best wished
Prof. Dr. Osama Abo-Seida

START

Is the molecule linear?

N ─── Y

Is the molecule linear? — Y → Does it have a centre of inversion? — Y → $D_{\infty h}$

Does it have a centre of inversion? — N → $C_{\infty v}$

Does it have two or more C_n axes with n>2? — N

Does it have two or more C_n axes with n>2? — Y → Does it have a centre of inversion? — Y → Does it have a C_5 axis? — Y → I_h

Does it have a C_5 axis? — N → O_h

Does it have a centre of inversion? — N → T_d

Does it have a C_n axis? — N

Does it have a C_n axis? — Y → Are there n C_2 axes perpendicular to the principal axis?

Does it have a mirror plane? — Y → C_s

Does it have a centre of inversion? — Y → C_i

Does it have a centre of inversion? — N → C_1

Are there n C_2 axes perpendicular to the principal axis? — Y → Is there a horizontal mirror plane? — (N) → Are there n dihedral mirror planes?

Is there a horizontal mirror plane? — D_{nh}

Are there n dihedral mirror planes? — D_{nd}

D_n

Are there n C_2 axes perpendicular to the principal axis? — N → Is there a horizontal mirror plane? — C_{nh}

Is there a horizontal mirror plane? — N → Are there n vertical mirror planes? — C_{nv}

Are there n vertical mirror planes? — N → Is there an S_{2n} axis? — S_{2n}

Is there an S_{2n} axis? — N → C_n

اجب عن الاسئلة الاتية :-

(1) a- State and prove the Blasius theorem

b- Find the displacement of the a fluid particle in the Lagrangian system of the velocity components for two dimensional fluid system can be given in the Eulerian system be $u = 2x + 2y + 3t, v = x + y + \dfrac{t}{2}$

----

(2) a- Find the Eulers Dynamical equation of motion and find the integration of Eulers equation of motion

b- Find the path lines of two dimensional velocity field $u = \dfrac{x}{1+t}, v = y, \omega = 0$.

----

(3) a- Find the equation of continuity by the Lagrangian method

b- At a point in a incompressible fluid having spherical polar coordinates, the velocity component are $(2Mr^{-3}\cos\theta, Mr^{-2}\sin\theta, 0)$ where M is a constant , show that the velocity is of the potential kind, find the velocity potential and equation of stream line.

----

(4) a -D iscuss a uniform flow past a circular cylinder with circulation

b- A stream is rushing from a boiler through a conical pipe , the diameter of ends of which are D and d; if V and v be the corresponding velocities of the stream and if the motion be supposed to be that of divergence from the vertex of con, prove that

$v/V = \dfrac{D^2}{d^2} e^{(v^2+V^2)/2k}$ where k is the pressure divided by the density

----

مع اطيب التمنيات بالتوفيق

اجب عن الاسئلة الاتية :-

(1) a- State and prove the Blasius theorem

b- Find the displacement of the a fluid particle in the Lagrangian system of the velocity components for two dimensional fluid system can be given in the Eulerian system be $u = 2x + 2y + 3t, v = x + y + \dfrac{t}{2}$

----

(2) a- Find the Eulers Dynamical equation of motion and find the integration of Eulers equation of motion

b- Find the path lines of two dimensional velocity field

$u = \dfrac{x}{1+t}, v = y, \omega = 0$.

----

(3) a- Find the equation of continuity by the Lagrangian method

b- At a point in a incompressible fluid having spherical polar coordinates, the velocity component are $(2Mr^{-3} \cos\theta, Mr^{-2} \sin\theta, 0)$ where M is a constant , show that the velocity is of the potential kind, find the velocity potential and equation of stream line.

----

(4) a -D iscuss a uniform flow past a circular cylinder with circulation

b- A stream is rushing from a boiler through a conical pipe , the diameter of ends of which are D and d; if V and v be the corresponding velocities of the stream and if the motion be supposed to be that of divergence from the vertex of con, prove that

$\dfrac{v}{V} = \dfrac{D^2}{d^2} e^{(v^2+V^2)/2k}$ where k is the pressure divided by the density

----

مع اطيب التمنيات بالتوفيق

Kafrelsheikh University
Faculty of Science
Physics Department
Fourth level (Phy.)
Second Term 2015/2016

Time: 2h
Subject: Plasma physics (PH454)
Total Marks: 100 (70 Written, 10 Oral, 20 Exercises)
Date: 8/6/2016
Exam in one pages

Answer the following questions;

===

Q1:   (20 degree)

a) Write about; collision frequency, collisionless plasma, plasma quasi-neutral,

b) Clarify the meaning of the Debye length, plasma frequency, conditions for plasma existence.

Q2:   (15 degree)

Write in brief the continuity equation, momentum equation, Poisson's equation for cold magnetized plasma.

Q3:   (20 degree)

Calculate the dispersion relation for warm electron plasma in the case of equilibrium ions.

Q4:   (15 degree)

Plasma discharges are generally created in closed discharge vessels using interior electrodes; write in brief about two methods of plasma discharge.

The End of exam

With my best wishes,

Dr. Atef Elbendary

Kafer El-Sheikh

Faculty of Science

Department of Mathematic.

Mathematic Fourth year

second term Exam 8/5 / 2016

Time: 2h

Functional Analysis (443 ر)

Answer the following questions:

(1) Proof that l^p is a Bnach Space .

(2) Proof Minkowski's inequity.

(3) Let $(X, \|,\|_x)$ be normed Space proof that there a complete

normed space $(\chi, \|,\|_x)$ (Completation of normed space).

(4)(a) Define dense set.

(b) Proof that the set of polynomials $P[0,1]$ is dense in C[0,1].

(5)(a) If A is a closed convex subset of a Hilbert space H, Proof that

$\forall x \in H$ there is a unique $a^* \in A$ such that $\|x - a^*\| = \inf_{a \in a} \|x - a\|$

(b) Find the best approximation of $f \in L^2(-1,1)$ with polynomial of

degree 3 where $f(t) = |t| \ldots, E = \{1, x, x^2, x^3, \ldots x^n\}$

انظر بقية الاسئلة في الخلف

(6)(a) If U is closed linear space of a Hilbert space H, Proof that

(1). $\forall x \in H$ can be written uniquely in the form $x = u + v ....., x \in U ..., v \in U^{\perp}$

(2) u is the closet point to x in U., $u == \sum_{j} < x, e_{j} > e_{j}$

(b) Proof Ries Representation theorem.

(7)(a) Proof that a linear operator $A : U \to V$ is continues iff it is Bounded.

(b) If $A : H \to H$ is a bounded linear operator on a Hilbert space

H. Proof that there a unique bounded linear operator

$A^{*} : H \to H ....such th..that ... < Ax, y >=< x, A^{*} y > ..... \forall x, y \in H$

Kafrelsheikh University
Faculty of Science
Chemistry Department
Fourth level (Chem.)
Second Term 2015/2016

Time: 2h
Subject: Carbohydrate(Ch 444)
Total Marks: 100 (70 Written, 10 Oral, 20 Exercises)
Date   8/6/2016
Exam in Tow page (عدد صفحات الإمتحان)

Q1-Write on: (60marks)

1-Write on the complete oxidation of one molecule of glucose and ATP yield? (15mark)

2-The structure of DNA and compare the difference with RNA?(8 mark)

3-B-Oxidation of Steric acid(18 C)and calculate ATP produced?(7 mark)

Answer five only

1. Osazone Formation ?(5mark)

2. Biosynthesis of vitamin c from glucose ?(5mark)

3. Structure of Disaccharide.?   (5mark)

4. Types of RNA Structures and Function ?(5mark)

5. Glycogen Metabolism? (5mark)

6. Define lipids,Bio medical importance,Classification? (5mark)

Q2 - Choose the correct answer: (10 marks)

1. Two sugars which differ from one another only in configuration around a single carbon atom are termed
   (A) Epimers   (B) Anomers(C) Optical isomers   (D) Stereoisomers

2. Mutarotation refers to change in
   (A) pH   (B) Optical rotation   (C) Conductance   (D) Chemical properties.

3. The sugar found in RNA is
   (A) Ribose   B) Deoxyribose   (C) Ribulose   (D) Erythrose

4. Oxidative decarboxylation of pyruvaterequires
   (A) NADP+   (B) Cytichromes   (C) pyridoxal phosphate   (D) COASH.

5.. In polysaccharides, monosaccharaides are joined by
   a) peptide bond   b) glucose bond   c) glycosidic bond   d) covalent bond

6. In which form Glucose is stored in animals?
   a) Starch   c) Dextrins   b) Glycogen   d) Cellulose

7. The number of isomers of glucose is
   (A) 2   (B) 4   (C) 8   (D) 16

8. Cane sugar is known as
   (A) Galactose   (B) Sucrose   (C) Fructose   (D) Maltose

9. Lactose is a disaccharide consists of
   a) glucose and fructose   b) glucose and galactose
   c) glucose and sucrose   d) glucose and ribose

10-Which of the following is not reducing sugar?
   (A) Lactose   (B) Maltose

(C) Sucrose   (D) Fructose

11-Lipid is formed by the condensation reaction between:
  a- Carbon and hydrogen.   c- Fatty acids and alcohol.
  b- Fatty acids and amino acids.   d- Fatty acids and amines.

12. Purine include
  a-Adenine and Guanine   b-Thymine and Cytosine
  c-Adenine and thymine   d- Cytosine and guanine

13-Lipids are important constituents of :
  a- Nucleus.   b. Ribosome.   c. Both a&b.   d. Biological membrane.

14-Which of the following is aderived lipid:
  a- Fats.   b- Oils.   c- Steroids.   d- Waxes.

15- Fats consists of:
  a- Alcohol linked by ester bonds to 3 fatty acids.
  b- Glycerol molecule linked by ester bond to 3 fatty acids.
  c- Glycerol molecule linked by ester bond to fatty acid.
  d- Glycerol molecule linked by ester bond to 4 fatty acid.

16-The type of sugar in DNA:
  a. Triose   b. Tetrose.
  c. Pentose   d. Hexose.

17-Adjacent nucleotide are joined by:
  a.Covalent bond.   b.Phoshodiester bond.
  c.Ionic bond.   d. Peptide bond

18.Whcih of the following features are common to mono saccharides?
  (A) Contain asymmetric centres   (B) Are of 2 types – aldoses and ketoses
  (C) Tend to exist as ring structures in solution   (D) Include glucose, galactose and raffinose

19. Which of the following is a substrate for aldolase activity in Glycolytic pathway?
  (A) Glyceraldehyde-3-p   (B) Glucose-6-p
  (C) Fructose-6-p   (D) Fructose1, 6-bisphosphate

20. DNA and RNA Are:
  a.Carbohydrates   b.Nucleic acid.
  c.Both a&b.   d.Lipid.

جيولوجيا

Kafrelsheikh University   **Geology Department**
Faculty of Science   **Fourth year**
Final Examination in *Stratigraphy of Egypt* (G437)
8/6/2016   **Time: 2 hours**

Answer the following questions:

I- Write an essay about the lithostratigraphy of the Gulf of Suez (*15 marks*)

II- Write short notes about: *(30 marks)*

   1- Geomorphology of the western desert.

   2- Carboniferous rocks in Sinai Peninsula.

   3- Eocene rocks in Egypt.

III- Shortly discuss: (*15 marks*)

   A- Geological Provinces of Egypt. (*10 marks*)

   B- Turonian strata in the western desert. (*5 marks*)

V - Shortly discuss the post-rifting succession in the Red sea. (*10 marks*)

With best wishes
Assoc. Prof. Dr. Aziz Abu Shama
(☎ 01066255510)

Kafrelsheikh university Faculty of Science Geology department	ore deposits and radioactive materials (G436) Total marks: 70 Time:2H Final Exam. Date: 1 /6/2016

Answer the following questions

First question : Answer the following questions: **25 degree**

1- Describe and draw three types of uranium deposits.
2- Mention five factors for the accuracy of radiometric dating.
3- Describe and draw the different types of exsolution textures .
4- Draw the cross section of ore microscope illustrating its essential components.
5- Mention how to prepare a doubly-polished thin section

Second question; complete the following sentences with right answer   **18 degree**

1-The radiocarbon dating depend on the ratio of----------- to ------------.
2-The radioactive parent and daughter elements used to date rocks are:
a------------b-----------------c-------------- and d----------------
3-The mathematical expression of the age equation is -----------------(define each symbol).
4-Nuclear fission releases amount of energy which can be calculated using an equation---------
(define each symbol).
5-Common thorium minerals include: a----------- b-------------and c--------------------(mention each formula).
6-The massive variety of Uraninite is………………………..(mention its formula).
7-Replacement texture of ore minerals depend for their development on some features as :
a----------------------, b-------------------------and c------------------
8- The important types of hardness include: a----------------b--------and c---------.
9-Objective lenses of ore microscope are classified according to: a-----, b------and c------.
10- Ore microscope differs than the conventional petrographic microscope in -------------
11-The purposes of grinding procedure are: a--------------,b-----------,c--------------
12- Examples of ore minerals that are distinctly colored in reflected light are: a----- and b-----
(mention its color).
13- Observations with the ore microscope are usually made either with: a--------or b-------.
14- The change of reflectance is a property termed-------------and the change of color is a property called--------------------
15-Enriched uranium is---
16- The international system units of radioactivity include: a-------,b-------and c------.
17-Examples of minerals that exhibit internal reflections are: a---------and b----------.

Third question: answer the following problems   **12 degree**

1-The half-life of Zn-71 is 2.4 minutes. If one had 100 g at the beginning, how many grams would be left after 7.2 minutes has elapsed?
2- A radioactive isotope has a radioactivity of 10.000 counts per second. What is the activity of this isotope after 3 half lives?

Fourth question: Answer the following questions :   **15 degree**

1-Define the Reflectance property observed by ore microscope.
2- Define the Half life of radioactive isotope (give a diagram).
3- Mention the different types of Beta Decays (give examples).
4- Define the reflector in ore microscope.
5-What is Nuclear Fission? (give example).

Best wishes
Prof. Dr. Nahed El-Shibiny

Kafrelsheikh University
Faculty of Science
Math. Department
Fourth level Math.
Second Term 2015/2016

Time: 2h
Subject :P.D.E.
Total Marks :(70)

أجب غن الأسئلة الأتية.

================

Q.1.

Prove that if $h^2 - ab \neq 0$;then the general solution of Euler equation

$$a\frac{\partial^2 u}{\partial x^2} + 2h\frac{\partial^2 u}{\partial x \partial y} + b\frac{\partial^2 u}{\partial y^2} = 0 \quad \text{is given by} \quad u(x,y) = F(x + \lambda_1 y) + G(x + \lambda_2 y)$$

Where F and G are two arbitrary function and λ_1, λ_2 are the two different roots of equation

$a + 2h\lambda + b\lambda^2 = 0$ (14)

Q.2.

Solve the B.V.P.

$$\frac{\partial^2 u}{\partial x^2} = \frac{y^2}{1 + x^2}, \qquad u(0,y) = e^y, \quad u(1,y) = y^3(\frac{\pi}{4} - \frac{1}{2}\log 2)$$ (12)

Q.3.

Find the solution of the wave equation

$$\frac{\partial^2 u}{\partial x^2} = \frac{1}{c^2}\frac{\partial^2 u}{\partial t^2}, \qquad u(x,0) = f(x), \qquad u_t(x,0) = g(x)$$ (12)

Q.4.

By using L.T. and C.Th. solve the following I.E.

$$y(x) = \sin 2x + \int_0^x y(\xi)\sin(x - \xi)d\xi$$ (12)

Q.5.

By using the M.S.Vars. solve the problem,

$$K\left(\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial x^2}\right) = \frac{\partial u}{\partial t}, \quad u(0,y,t) = u(1,y,t) = u(x,0,t) = u(x,1,t) = 0$$

$$u(x,y,0) = f(x,y)$$ (20)

أجب غن الأسئلة الأتية.

Q.1.

Find the initial value problem equivalent to the Integral equation :

$$u(x) = x^3 + \int_0^x (x-t)^2 u(t)dt \qquad (14)$$

Q.2.

Solve the following Fredholm integral equation by two different method

$$u(x) = e^x - 1 + \int_0^1 t\, u(t)dt \qquad (18)$$

Q.3.

Prove that the solution of the I.E.

$$u(x) = \sec x \tan x - \frac{1}{4}\left(e^{\sec x} - e\right)x + \frac{1}{4}\int_0^x x e^{\sec t} u(t)dt$$

is given by $u(x) = \sec x \tan x$ \qquad (14)

Q.4.

Solve the following Integro-differential equation

$$u''(x) = x Cosh\, x - \int_0^x t\ u(t)dt \qquad (14)$$

$$u(0) = 0, \qquad u'(0) = 1$$

Q.5.

Find the solution to the following Abel`s problem

$$4\sqrt{x} = \int_0^x \frac{u(t)}{\sqrt{x-t}}dt \qquad (10)$$

Kfr El-sheikh University
Fac. Of Science
Bot. Department
2nd Term May/2015/2016
Examiner: Dr. Awatef Saad

4st level: Botany
Course Title: Plant Enzymology and Bioenergetic
Points: 70
Time allowed: 2hrs

Answer the following questions

1st Question

A- **Complete the missing parts**:   (15 points)

1) In laboratory it can be stated that the reaction proceeds through the three stages which are ...., ... and ....

2) Substrate- strain theory stated that ....

3) One .... is that amount of enzyme which catalyzes the conversion of one mole of substrate into product in one second under the experimental conditions.

4) ....enzymes which bind metal ions and retain their metal atom(s) under all conditions with very high affinity.

5) Coenzymes are .... organic molecules that function as essential parts of enzymes and often serve as .... needed for reactions that would be difficult or impossible using only simple acid–base catalysis.

6) NAD can react reversibly with the ....of two different enzymes. First it forms an active complex compound with a 1st enzyme and accepts .... removed from the substrate forming a NADH which dissociates and associate with a 2nd enzyme donating the .... to the substrate of the 2nd enzyme according to the following diagram.

7) TPP is synthesized by adding two .... groups from .... to the alcohol group of thiamin using Mg^{2+} catalyzing by synthetase. The physiological action of thiamin is due to this .... ester.

8) The enzymes that require FMN or FAD as cofactors are termed ....

9) An α-amino acid is composed of five different groups: .... and carboxyl (COO^-) groups attached to a central carbon atom, called the ...., a hydrogen atom, and a distinctive R group.

10) Bioenergetics is the quantitative study of the ....

B- **Write short notes on each of the following**   **(25 points)**

a) Coenzyme A

b) Three thermodynamic quantities that describe the energy changes occurring in a chemical reaction and the quantitative relation to each other.

c) The differences between competitive and substrate inhibitors.

d) The Michaelis constant.

Kafr Elshiekh University

Faculty of science

Zoology Department

4th level of zoology

2nd term exam 2016-05-15

subject: physiology 2

Time allowed: 2 hours

Total marks : 70 marks

1)MCQ:-   10 marks

a) A hormone which diffuses in tissue fluid is (paracrinal-neurocrinal-enndocrinal).

b) Touch, pressure and vibration receptors located in (muscles- skin-aortic arch).

t) Unconscious kinesthetic sensation are senses of (muscle length-tension-muscle length and tension).

d) Microtubules function is (cell division- cytoskeleton-mechanical support).

e) Trigeminal nerve is a motor supply for muscles of (mastication-swallowing-stretching).

2)Write about the following   25 marks

a) Function of cell membrane protein.   b) Tactile sensation.

c) Centriole- Microtubules-Microfilaments.   d) Facial, hypoglossal and optic cranial nerves.

e) Cerebrospinal fluid (CSF).

3-Supply the missing words :-   15 marks

a) Trans-ducer convert the energy of stimuli into …………changes.
b) Sarcoplasmic reticulum present in ………..and play a role in……………. .
c) The carrier protein has two sites one for…………..and the second for………..
d) Proprioceptors located located in………… , ……………
e) Miosis means …………………………..
f) The cerebrum consists of two cerebral hemisphere each of which comprises of four lobes namely ………… , ……….. , …………… And………….the two hemisphere are connected in the midline by……………
g) From the functions of lysosomes are, ………………. , ………………

4-Explain:-   20 marks

a) The process of Na+-k pump
b) **5** functions of parasympathetic nervous system and its origin
c) The mechanism of equilibrium , with illustrating the vestibular system
d) The steps of endocytosis and compare between pinocytosis and phagocytosis.

Examining committee: Prof.Dr. Nora Fathalla, Prof.Dr. Samaa Bakr, Prof.Dr. Eatmad Zanaty

Answer the following questions:

First question

Write all you know about:

a) Photo-dissociation reactions & photo-ionization reactions occurring in the atmosphere.

b) Sampling and storage of environmental water samples.

(20 marks)

Second question

a) When measuring the alkalinity of three water samples, 100 ml of each of these samples were titrated with a standard 0.10 M HCl solution using phenolphthalein and methyl orange indicators and the titer values of two indicators are P and M, respectively. The obtained results were:

Sample no.1: P = 6.4 ml & M = 16.7 ml,

Sample no.2: P = 4.2 ml & M = 6.1 ml,

Sample no.3: P = 5.7 ml & M = 11.4 ml.

Determine the identity of anions (OH^-, CO_3^{2-}, HCO_3^-) might be found in each sample. Calculate the concentration of each present anion.

b) Discuss the sources of Pb & Cd in the drinking water samples.

(20 marks)

Third question

a) Define the OD. Compare between COD & BOD.

b) Write about sources of sulfur compounds in the troposphere, mentioning how emission of these gases could be measured, controlled and the health effects of SO_2 gas.

(15 marks)

Fourth question

Discuss:

a) Factors affecting DO in the environmental water samples.

b) Physical & chemical methods for the determination of DO.

(15 marks)

Best wishes..

Kafr El-Sheikh University
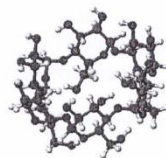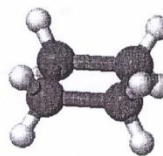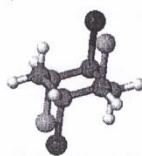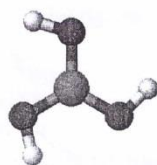**Faculty of Science**
Chemistry Department

Subject: Group Theory
Time: 2 hours
Date: 12/6/2016
Level: Four

Exam for Academic year 2015/2016

Answer the following questions:

1- Put true or false and correct

    a- Symmetry elements are carried out with respect to points, lines, or planes.

    b- Rotation about an n-fold axis can be calculated by $180°/n$.

    c- The molecule belongs to C_s if it has the identity and a mirror plane alone.

    d- A molecule that has an n-fold principle axis and n twofold axes perpendicular to C_n belongs to D_n.

    e- Carbon monoxide belongs to C_{2v} group.

2- Discuss two application of the symmetry group.

3- Find a symmetry group for the following compounds:

With my best wishes
Dr. Hamdy El-Sheshtawy