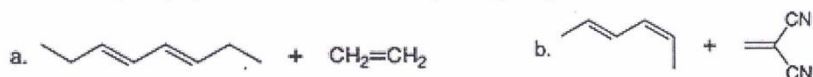




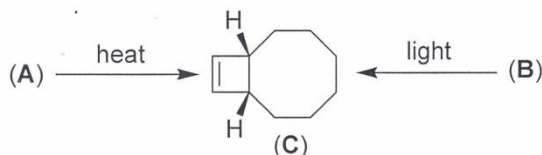
المادة :- Organic Reactions & Orbital Symmetry

Answer the following questions:-

- Using atomic energy level diagram, show and discuss how removing an electron completely from atoms of carbon, oxygen, or fluorine (i.e., ionizing the atoms) requires different amounts of energy. **(10 degrees)**
- Explain the fact that: While butadiene is more thermodynamically stable than two isolated double bonds (i.e., ethylene), it is also more reactive than ethylene.
- Sketch, discuss and compare the MO energy level diagrams for the pi-bonds resulting from two carbon atoms combining ($C=C$) and from a carbon atom combining with an oxygen atom ($C=O$). **(10 degrees)**
- Based on FMO theory, discuss the overlapping of two p atomic orbitals that constitutes a pi-bond in ethylene molecule. (Note that the energy of HOMO of ethylene is -10.52 eV & LUMO is $+1.5$ eV). **(10 degrees)**
- Draw the product (including stereochemistry) formed from each pair of reactants in a thermal [4+2] cycloaddition reaction. **(10 degrees)**



- The bicyclic alkene **C** can be prepared by thermal electrocyclic ring closure of cyclodecadiene **A** or by photochemical electrocyclic ring closure from cyclodecadiene **B**. Draw the structure of **A** and **B**, and indicate the stereochemistry of the process by which each reaction occurs. **(10 degrees)**



- Draw the molecular orbital energy levels ($\psi_1 - \psi_7$) of the 1,3,5-heptatrienyl anion ($CH_2=CH-CH=CH-CH=CH-CH_2^-$). Assign which orbitals are occupied, which orbital is the HOMO, which orbital is the LUMO. Identify the bonding, non-bonding and antibonding molecular orbitals. **(10 degrees)**

WITH MY BEST WISHES

Prof. Ashraf El-Shehawy



Answer the following questions.

- (5) Discuss Boher theory of the hydrogen atom and state the fundamental postulate of the Bohr.

(15 Marks)

- (6) Find the Schrodinger wave equation and discuss basic postulates of quantum mechanics.

(20 Marks)

- (7) Discuss tunnel effect and find the transmitted coefficient and find the allowed energy values and also find the wave function of the harmonic oscillator in one dimensional.

(20 Marks)

- (8) (a) Prove that $[\hat{j}_x, x]\psi = 0$, and $[\hat{j}_x, y]\psi = i\hbar z\psi$
(b) Verify the operator equations

$$\left(\frac{\partial}{\partial x} + x\right)\left(\frac{\partial}{\partial x} - x\right)\psi = \frac{\partial^2}{\partial x^2}\psi - x^2\psi - \psi$$

(15 Marks)



Kafrelsheikh University Second term
2015-2016

Faculty of Science

Third level (zoology)

Time: 2h.

Subject: Morphology and
taxonomy of insects
70 Marks

Answer the following questions:

1- Write short notes on:

Order Odonata- mouth parts and body wall of cockroach with drawing.

2- a- Explain the alimentary canal of cockroach showing salivary glands of it with drawing.



b- Explain blood vascular system of cockroach with drawing.

c- Explain excretory system of cockroach with drawing.

d- Complete this sentence:

Each leg of cockroach consists of ----- segments,-----,-----,-----,
-----,-----.

With best wishes,
Dr. Alyaa Gazzy.

Kafr El-Sheikh University	 	Course Title: Algae and Physiology of Algae
Faculty of Science		Course Code: N-317
Botany Department		Time allowed: 2 h.
Special Botany Program		Written Exam Marks = 70
Level - 3		Exam in <u>1</u> page only.
Semester - 2	Academic Year: 2014/2015	Date: 26/5/2016.
Total paper marks = 100 mark = written (70) + practical (20) + oral & semester works (10).		

Answer the following questions with fully labeled diagram:	Mark
1- Discuss the basic nutrient requirement for industrial cultivation of algae.	20
2- Illustrate the life cycle of <i>Spirogyra</i> .	15
3- Follow up the life cycle of <i>Chlamydomonas</i> .	15
4- Explain in brief one of the various applications of Algae, represented during your study.	20
Total marks of written exam:	<u>70</u>

Best Wishes	26/5/2016
Examiner:	Dr.: Anwer S. M. El-Badry



solid state (2)
العام الجامعي 2015-2016
كود المقرر : ph 332

جامعة كفر الشيخ
كلية العلوم
قسم الفيزياء

تاريخ الامتحان : 2016/5/26

First question

Choose the correct answer for the following

1- The radius of Cu atom = 1.276 \AA at fcc lattice, its atomic mass = 63.57 so its density in g/cm^3 is

- a - 9 b - 10 c - 12 d - 5

2- The free volume at bcc lattice is occupied by atoms with radius r and a is the lattice constant

- a - $0.32a^3$ b - $0.52a^3$ c - $0.26a^3$ d - $0.72a^3$

3- The number of atoms per cm^2 in (111) planes of Pb crystal which is an fcc with lattice constant $a = 4.93 \text{ \AA}$

- a - 4.99×10^{14} b - 2.99×10^{14} c - 1.0×10^{13} d - 5.81×10^{13}

4- The ratio $\frac{G_{200}}{G_{111}}$ for Pb crystal (fcc), where $r_{\text{Pb}} = 1.743 \text{ \AA}$

- a - 2.63 b - 1.16 c - 2.0 d - 1.01

5- The coordination number for bcc lattice is

- a - 8 b - 12 c - 6 d - 9

6- If the reciprocal lattice vector is G and the real lattice vector is T so $e^{i(G \cdot T)}$ equals

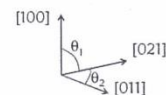
- a - 0 b - 2π c - π d - 1

7- The miller indices for the plane with interceptions 1, 2, 3 are

- a - (326) b - (236) c - (623) d - (633)

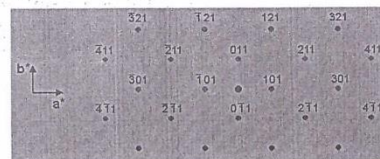
8- The angle Θ_1 in a figure equal

- a - 30 b - 45 c - 90 d - 75



9- The following diffraction pattern represent unit cell of type

- a - Fcc b - bcc
c - primitive d - hexagonal

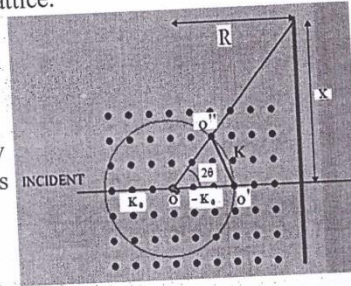


Second question

- a- Determine the volume of the fcc unit cell in reciprocal lattice
- b- Determine the filling factor for bcc unit cell and determine the nearest neighbors distance.
- c- Discuss the Laue condition for reciprocal lattice.

Third question

- a- Define Ewald sphere and show how we can determine the unit vector G from the diffraction pattern.
- b- Determine the structure factor and intensity of the diffracted x-Ray for Fe crystal which is bcc lattice and has a center of symmetry.



Fourth question

- a - Calculate the structure factor F_{hkl} for Titanium if atoms coordinates are

$(0,0,0), (\frac{1}{3}, \frac{2}{3}, \frac{1}{2})$ for the plane 010.

- b- Determine The condition for ion with radius r to occupy the octahedral site
- c - Find miller indices for the face shared the two zones directions $[325]$, $[134]$

المستوى الثالث
الفتره الهاميه
الإمتحان ٢٠١٦/٥/٣٠

Kafr Elsheikh University
Faculty of Science
Geology Department
Final exam of the 2nd term



Third Level
Date: 30/5/2016
Time: 2 Hours
Degree = 70

"Marine Geophysics"

Answer the following questions: (30 minutes, 17.5 points for each question)

- (1) - A- Discuss in detail seismic inversion and support your answer with sketches.
B- In a table, compare between disadvantages of interpreting amplitudes (seismic data) and advantages of using acoustic impedance (seismic inversion).
- (2) A- Write in detail about seismic attributes.
B- compare between coherence and curvature attributes.
- (3) - A- Give a note about Amplitude-Versus-Offset (AVO). Explain your answer with simple sketch.
B- Discuss with sketches the standard AVO attributes Intercept and Gradient.
- (4) - A- Discuss in detail the 4D seismic methods. Support your answer with a sketch showing the change in saturation as a function of time.
B- Explain how can you calculate the Fluid Factor attribute (FF) from the Intercept and Gradient (I and G) crossplot method. Support your answer with a sketch.



Answer the following equations:

Question (1):

(20 marks)

- (a) Write in details about the pulse-type ionization chamber
- (b) Show how the gas detectors can be used to detect neutrons?

Question (2):

(13 marks)

Write in details about the energy and time resolution of the scintillation detectors

Question (3):

(13 marks)

Define the dead time and the recovery time for Geiger counter, Then explain the pulse shape of the Geiger counter's output

Question (4):

(24 marks)

Write in details on the following electronic devices:

- (1) Single channel analyzer
- (2) Preamplifier
- (3) Counter and timer

The End of exam

Dr. Kamal Reyad



Answer the following questions:

Question 1: Discuss briefly the following: 25 Marks

- 1- The vapor or liquid phase fabrication of nanoparticles.
- 2- Hydrothermal synthesis of nanoparticles.
- 3- Mechanical properties of nanomaterials.
- 4- Optical properties of nanomaterials.
- 5- Effect of capping agents (stabilizers) in synthesis of nanoparticles.

Question 2: 25 Marks

Compare the most important differences between the following:



- i- Graphene & Carbon Nanotubes.
- ii- Nanoparticles & Quantum dots.
- iii- DLS & X-ray powder diffraction.
- iv- Nanoscience & Nanotechnology.
- v- Doped nanomaterials & nanocomposites.

Question 3: 20 Marks

- A- "The purity of nanomaterials is very important" explain this sentence and how could you determine the purity of a synthetic nanomaterials?
- B- Write short notes on the applications of nanotechnology in the field of: remediation – water filtration – catalysis – medicine.
- C- Why are nanomaterials important?

Good Luck for all

Dr. Ibrahim Elmehasseb

Kafr El-Sheikh University			Course Title: Microbial Biotechnology
Faculty of Science			Course Code: N-315
Botany Department			Time allowed: 2 h.
Special Botany Program			Written Exam Marks = 70
Level - 3			Exam in <u>1</u> page only.
Semester - 2	Academic Year: 2014/2015		Date: 30/5/2016.
Total paper marks = 100 mark = written (70) + practical (20) + oral & semester works (10).			

Answer the following questions with fully labeled diagram:	Mark
1- Discuss the different methods of preserving microorganisms.	15
2- Illustrate PCR technique for amplification of a microbial genetic material.	15
3- Discuss the place and function of microbial culture collections.	15
4- Explain in brief one of the various applications depending on the field of microbial biotechnology, represented during your study.	25
Total marks of written exam:	<u>70</u>

Best Wishes	30/5/2016
Examiner:	Dr.: Anwer S. M. El-Badry

Examination for third level students special zoology
Physiology of Invertebrates

Second term

time allowed

Answer the following questions:

A) Write a short note:

1. Flame cells as an excretory structure.
2. Fate of phosphoenol pyruvate in amitochondriate protozoa tell production of end product.
3. All-or-None Principle in nerve impulse transport.

B) Fill in the space:

1. In protozoans animal's osmoregulation is carried on by
2. Hemolymph is composed of fluid plasma in which cells called are suspended.
3. In a resting neuron the outside has a charge and the inside has a charge.
4. The typical means of asexual reproduction in sponge is either or
5. All flatworms are flattened dorsoventrally because.....

C) Define the following:

1. Parasitism.
2. Choanocytes in sponge.
3. Hemocyanin.

Best wishes,

Examination for third level students special zoology
Physiology of Invertebrates

Second term

time allowed

Answer the following questions:

A) Write a short note:

1. Flame cells as an excretory structure.
2. Fate of phosphoenol pyruvate in amitochondriate protozoa tell production of end product.
3. All-or-None Principle in nerve impulse transport.

B) Fill in the space:

1. In protozoans animal's osmoregulation is carried on by
2. Hemolymph is composed of fluid plasma in which cells called are suspended.
3. In a resting neuron the outside has a charge and the inside has a charge.
4. The typical means of asexual reproduction in sponge is either or
5. All flatworms are flattened dorsoventrally because.....

C) Define the following:

1. Parasitism.
2. Choanocytes in sponge.
3. Hemocyanin.

Best wishes,

7) Channel fill pattern in this graph is

- A. Mound onlap
- B. Divergent
- C. Prograded
- D. Onlap



8) Forced regression is occurring when the

- A. Falling base level irrespective of the sediment supply
- B. Rising of base level
- C. Shoreline is forced to regress by the falling base level ✓
- D. A and C together
- E. B and C together

9) If the platform break and downlap planes are convergent-divergent, the basin architecture is

- A. Strat shallowing then deepening upward
- B. Shallowing upward only
- C. Deepening upward only
- D. Strat deepening then shallowing upward

10) MFS separates between

- A. Prograding stacking patterns above from retrograding stacking patterns below
- B. Prograding stacking patterns above from aggrading stacking patterns below
- C. Prograding stacking patterns below from retrograding stacking patterns above

11) Sequence boundary is ----- the forced regression.

- A. Over
- B. It
- C. Below
- D. A and B together

12) Sequence development is controlled by

- A. Relative sea-level change only
- B. Water depth and global eustasy
- C. Global eustasy only
- D. All of these

13) In a retrogradational parasequence set older parasequence tend to be ----- younger parasequence in the set.

- A. Thinner than
- B. Thicker than
- C. Not change significantly
- D. Not all of these

14) Lapout is

- A. Apparent truncation
- B. Onlap, downlap and toplap
- C. Onlap and downlap only
- D. Toplap and downlap only



Kafr – El sheikh university

Faculty of science

Math . Department

Third year (math .)

Second term Ex . 2016

Time: 2 hour

Subject : Number Theory

Degree : 70

Date 30/5/ 2016

Exam in one page عدد صفحات الإمتحان

Answer the following ;

1 - a - Define Ferma numbers ? and use the method of Ferma to anylise $n = 119143$?

b - Find the solution of Defonts equation ; $56x + 72y = 40$ (17) Degree

2 - a - Prove that the congruent relation is an equivalent relation on the set Z ?

b - Prove that there exists for any positive integer analog Aldharby moduls n
iff $(a, n) = 1$? (17) Degree

3 - a - Prove that $F_5 = 2^{32} + 1 \equiv 0 \pmod{641}$?

b - Find a maximum solution not unmatched for the equation ; $27 \equiv 3 \pmod{15}$?
(17) Degree

4 - a - Use the congerent for solving ; $7x + 5y = 3$?

b - Define compatiabile system ? and prove if there exists a solution for the system ,

$$x \equiv c_1 \pmod{m_1} , x \equiv c_2 \pmod{m_2} , x \equiv c_k \pmod{m_k}$$

then the system is compotiable ? (19) Degree

Dr . F . S . Helal

انتهت الأسئلة



- e- Unwinding of the double helix by DNA polymerase I.
- 3- The RNA strand synthesized during transcription elongates until
- a- The entire chromosome has been copied into RNA.
 - b- The RNA polymerase runs into the next gene.
 - c- An intron is encountered on the DNA template strand.
 - d- The RNA polymerase runs out of single-standed DNA template.
 - e- A specific termination sequence is reached on the DNA template strand.
- 4- Which of the following processes occur in the nucleus of a eukaryotic cell?
- a- DNA replication
 - b- Transcription
 - c- Translation
 - d- RNA processing
 - e- None of the above
- 5- At the completion of DNA replication, each newly synthesized DNA strand is
- a- Identical in sequence to the strand opposite which it was synthesized.
 - b- Complementary in sequence to the strand opposite which it was synthesized.
 - c- A hybrid strand, consisting of both DNA and RNA nucleotides.
 - d- Oriented in the same direction as the strand opposite which it was synthesized.
 - e- Fragmented, consisting of multiple short DNA fragments.
- 5]- Detect the following terms: (15 marks)
- a- monosictronic and polycistronic mRNAs.
 - b- generalized transduction
 - c- wobble
 - d- replication fork
 - e- ribozymes
- 6]- Short Answer (5 marks)
- 1- are highly conserved nucleotide sequences in the DNA that determine the sites where RNA synthesis is initiated.
 - 2- As an intron in a nuclear in a primary mRNA is removed, it is looped into a structure that is referred to as a
 - 3- Noncoding DNA found between genes is often referred to as
 - 4- The in a tRNA molecule base pairs with a group of three nucleotides called the in the mRNA template molecule.
 - 5- Many functionally related bacterial genes are organized into clusters called
- 7]- Explain by drawing only: (10 marks)
- a- bacterial protein synthesis
 - b- life cycle of bacteriophage λ



Answer the following questions:

- [1] a- Express any vector r as a linear combination of three non-coplanar vectors a, b, c .

b- Prove that if $\frac{1}{\lambda} = [a b c] \neq 0$ then

$$(r.c)(a.b) - (r.b)(c.a) = \lambda[rca] \{(c.b)(a.b) - (c.a)(b.b)\} \\ - \lambda[rab] \{(a.c)(b.c) - (a.b)(c.c)\}.$$

- [2] a- Prove that
 $[a \times b, c \times d, e \times f] = [abd][cef] - [abc][def]$
 $= [abe][fcd] - [abf][ecd]$
 $= [cda][bef] - [cdb][aef]$

b- Express the scalar triple product $[a b c]$ in terms of any three non-coplanar vectors ℓ, m, n .

- [3] a- Find e^{At} for $A = \begin{bmatrix} 2 & 1 & 0 \\ 0 & 2 & 1 \\ 0 & 0 & 2 \end{bmatrix}$

b- Find $\frac{dA}{dt}$ and $\int_0^1 A dt$ if $A = \begin{bmatrix} \cos 2t \\ te^{3t^2} \end{bmatrix}$.

- [4] a- Reduce $(a \times b) \times (c \times d) + (a \times c) \times (d \times b) + (a \times d) \times (b \times c)$ in its simplest form and show that it is $-2 [b c d] a$.

b- If a, b, c be three non-coplanar vectors for which $[a b c] \neq 0$ and a^1, b^1, c^1 constitute the reciprocal system of vectors, show that any vector d can be expressed as

$$d = (d \cdot a^1) a + (d \cdot b^1) b + (d \cdot c^1) c.$$

القسم ١٦١٦٢
Kafrelsheikh University
Faculty of Science
Geology Department

Full mark: 100 (70 written,
10 oral, 20 Lab)



المستوى الثالث
Date: June, 2, 2016
Time allowed: 2 hrs
Subject: Subsurface geology
and Petroleum geology
(G326)
Grade: 3rd Level – Geology
Final Exam in three pages

Note: support your answer by drawings.

ملحوظة: الإمتحان في ثلاث صفحات

1. Complete the following sentences:

(7 marks)

1. High porosity plus low permeability equal ----- production rate for a long time.
2. API gravity and oil viscosity are generally ----- to one another.
3. Main groups of organic matter are ----- , ----- , ----- and -----.
4. Petroleum system is -----.
5. Organic richness is affected by ----- , ----- and -----.
6. The pore filling kaolinite reduces the ----- , but has little effect on ----- of a sandstone.
7. Gas hydrates have ----- density, coupled with ----- resistivity and acoustic velocity.

2. Choose the correct answer of the following:

(10 marks)

1. The reservoir must be sealed by a ----- rock.
A. Permeable B. Porous C. Very high capillary pressure D. Low porous
2. API = ----- / specific gravity 60/60f -131.5.
A. 114.5 B. 411.5 C. 141.5 D. 114
3. During the Catagenesis stage, petroleum is released -----.
A. First oil and later gas B. First gas and later oil
C. First oil and later water D. First gas and later water
4. Vitrinite reflectivity R_o increases from -----.
A. Catagenesis stage to diagenesis stage

- B. Catagenesis stage to Metagenesis stage
- C. Diagenesis stage to Catagenesis stage

5. ----- = basin area * average total area of source rock * transformation ratio.

- A. Amount of petroleum generated
- B. Volume of kerogen generated
- C. Amount of oil potential

6. Secondary migration occurs by -----

- A. Buoyancy
- B. Differential pressure
- C. Different densities of the respective fluids
- D. B and C

7. Natural gas is mainly composed of ----- compounds.

- A. Organic
- B. Organic and inorganic
- C. Inorganic
- D. Inorganic, mixed and organic

8. Type III of kerogen is composed of -----

- A. Phyto- and zooplankton
- B. Land plants
- C. Algal

9. ----- forms during the overmature stage of kerogen.

- A. Oil only
- B. Oil then gas
- C. Methane then Graphite
- D. Gas only

10. The depositional environments of the pre-rift stage are common characterized by ----- sediments.

- A. Marine
- B. Clastic
- C. transition
- D. Marine and clastic

3. Define all the following:

(8 marks)

- 1. Buoyancy
- 2. Trap closure
- 3. Oil & gas window
- 4. Clay dehydration
- 5. Crude oil
- 6. Preservation time
- 7. Net pay
- 8. Trap fluids

4. Describe briefly the structural, sedimentation characteristics and possible oil traps during different stages of Extensional basins. (11 marks)

5. Write a brief only FIVE of the following:

(25 marks)

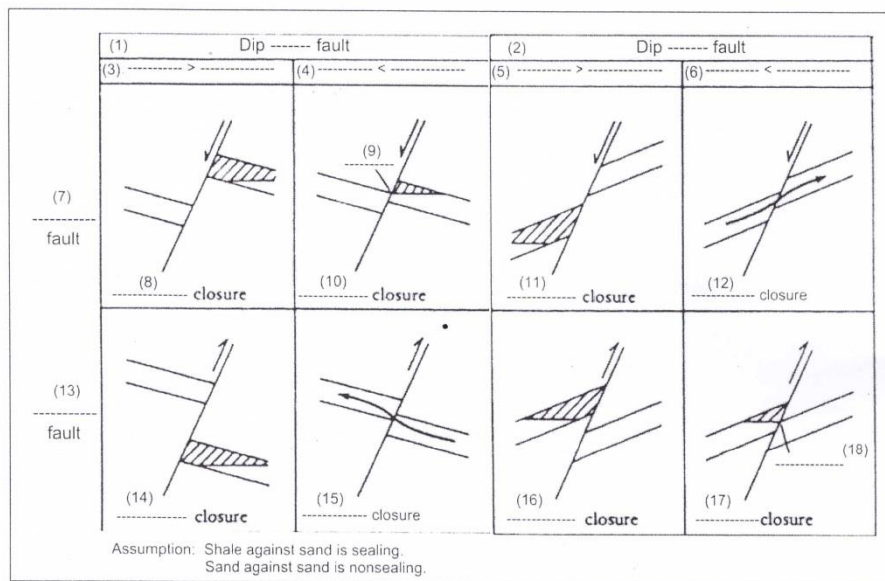
- 1. Mechanism and theories of petroleum migration. (إجباري)
- 2. Reservoir quality controls.

3. Diapiric and hydrodynamic traps.
4. The positive effect of diagenesis on sandstone reservoirs.
5. Formation and maturation of kerogen.
6. Types and proves of hydrocarbons migration.
7. Simple caliper log, interpretation and uses.

6. Given that the drawn bed in the following figures is composed of permeable sand and the rest is shale, it is required to: (9 marks)

Complete the spaces in the descriptions of these configurations of petroleum traps associated with faulting, assuming that oil can move across and not up the fault plane when permeable sands are juxtaposed.

ملاحظة: اكتب الارقام التي تشير إلى الفراغات مرتبة (مسلسلة) في كراسة الاجابة.



Best wishes

Dr. Mohamed ELHossainy



Kafr Elshiekh University

Faculty of science

2nd term exam 2016

subject: physiology

Zoology Department

Time allowed: 2 hours

3rd level of zoology

Total marks: 70 marks



1) Write on the following:- 25 marks

- a) Endorphin and Enkephalin theory
- b) Fat metabolism
- c) The steady state (second wind)
- d) Hyperthermia (heat stroke) and fever
- e) Types of sweat glands

2) MCQ 10 marks

- a) When one liter of O₂ is used to oxidize carbohydrates it gives (more-less) energy to oxidize fat or protein.
- b) Appetite is controlled by (hypothalamic-thalamic-cerebral cortex) appetite.
- c) Starvation leads to reduced glandular activity (exocrine-endocrine-both exocrine and endocrine) and this leads to (increase- decrease-reduction) of B.M.R. over a period of days.
- d) Conditioned stimuli and psychological factors may (stimulate- inhibit-stimulate or inhibit) appetite.
- e) During starvation R.Q drops to 0.7 due to use of stored (fat-fat-protein).

3) Supply the missing words: 15 marks

- a) Burnt skin is less effective at.....
- b) Meissner's corpuscles are sensitive to.....while, Pacinian corpuscles respond to.....
- c) Appetite is measured byneeded to produce satiety.
- d) The energy liberated from oxidation of food, appears as..... and.....
- e) Sunstroke is a condition ofdue to direct.....accompanied with.....due to.....on the.....and.....
- f) Sweat is..... solution of.....actively secreted byglands.

4) Explain: 20 marks

- a) Gate control theory for pain modulation.
- b) The adaptation to cold atmosphere.
- c) Alimentary tract factors affecting appetite.
- d) Causes of obesity and treatment.

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



Answer the following questions

1]- True/False with correction (10 marks)

- 1- The statement that the DNA double helix is antiparallel means that the nucleotides of one of the DNA strands are upside-down relative to the nucleotides of the other DNA strand.
- 2- Bacteriophage T4 can enter a lytic cycle or a lysogenic cycle
- 3- In bacteria, crossing over usually occurs between a fragment of the chromosome from a donor and an intact circular chromosome in a recipient cell.
- 4- The 5' cap structure on a bacterial mRNA is used to locate the start site for protein synthesis on that mRNA.
- 5- Most eukaryotic DNAs contain multiple origins of replication, whereas most bacterial DNAs contain only one *ori*.
- 6- A protein composed of 300 amino acids would be encoded by an mRNA of 100 nucleotides.
- 7- It is possible for an RNA polymerase molecule and a ribosome to be attached to an eukaryotic mRNA simultaneously.
- 8- Parasexual mechanisms are partially responsible for rapid evolution in bacteria.
- 9- RNA polymerase synthesizes an RNA double helix from a DNA template.
- 10- Each step involved in adding an amino acid to a growing protein chain requires energy.

2]- one strand of a section of DNA isolated from *Pseudomonas syringae* reads 5'-GGCAAATTTTCCGCAAA-3'. What would be the 5' to 3' nucleotide sequence of the mRNA transcribed from this DNA strand? (5 marks)

3]- Explain the mechanism of copying DNA into RNA. (15 marks)

4]- Multiple Choice (10 marks)

- 1- Which one of the following is not directly involved in the process known as translation ?

a- mRNA b- DNA c- Peptidyl transferase d- Ribosomes
e- Aminoacyl-tRNA synthetases

- 2- Which of the following events occurs during DNA replication in *E. coli*?

a- Removal of Okazaki fragments by DNA polymerase III.
b- Discontinuous synthesis of DNA on the leading strand.
c- Synthesis of short RNA primers.
d- Degradation of the old (parental) double helix.



اجب عن الاسئلة الاتية :-

(1) a – Find the Cauchy surface stress for an elastic body

b-prove that $2(\tau_{\nu})_{\max} + \sigma_n^{(3)} = \sigma_n^{(1)}$

(2) a - The stress tensor at the point p in Cartesian coordinates x,y ,

z is given by $\sigma = \begin{bmatrix} 3 & 1 & 1 \\ 1 & 0 & 2 \\ 1 & 2 & 0 \end{bmatrix}$ Find the prensiple stresses and the principle axis of stress

b – solve the problems elastaic theory in the distances.

(3) a – Find the Compatibility conditions of strain

b - If $\underline{u} = (-\alpha yz)e_1 + (\alpha xz)e_2 + (0)e_3$

Find the component of strain tensor and satisfied from compatibity conditions of strain

(4)Find the relation between stress and strain to elastic body istropic media

مع اطيب التمنيات بالتوفيق



Answer the following questions

- (1) Derive the forms of the four coupled equations for Maxwell equation in free space

(20 Marks)

- (2) Write a short note about them:

(i) The gauge transformation

(ii) Lorentz condition

(iii) The electromagnetic potential.

(15 Marks)

- (3) a - Prove that H, B, E and j satisfy the same equation for the uncharged conductor

b - Find the law of transformation for the components of the electric field.

(20 Marks)

- (4) - Discuss reflection and refraction of electromagnetic wave dielectrics.

(15 Marks)

مع أطيب التمنيات بالتوفيق



2. Addition of two molecules of HCl to D-limonene gives----(6)----- which is no longer ---(7)----- as it contains----(8)----- carbon atom.
3. Vitamin C is considering as ----(9)----- vitamin, and its structure is ---(10)-----but vitamin D is ----(11)----- vitamin, which considers as --(12)-----which is produced by --(13)----- in liver and kidney.
4. All steroids are related to---(14)- structure which has ----(15)-----ring condensed with ----(16)-----
5. Testosterone is the --(17)----- hormone, it's a member of ---(18)---- class, and its structure is ----(19)-- while ---(20)---- is steroid hormone produced by adrenal glands, and its structure is----(21)----, ----(22)----- are particles found in plasma that transport lipids including cholesterol.

Question 3 Write the sequences of the following chemical reactions explain reaction mechanism if found (Give Names of Products Obtained) (27 Marks)

1. Oxidation of myrcene
2. Biosynthesis of D-Limonene from geranyl pyrophosphate
3. From *p*-toluic acid to α -terpineol (Give method's name)
4. Oxidation of Menthone
5. Draw two Pairs of isomers of menthol.
6. Reaction of α - pinene with ethanol in the presence of H_2SO_4 .
7. Reaction mechanism of protonation of isoborneol.(Give reaction's name)
8. Oxidation of β - Carotene
9. Oxidation of Vitamin C
10. Reduction of *s*-carvone with Zn and CH_3COOH
11. Synthesis of α -terpineol from limonene
12. Synthesis of camphane from camphor (Give reaction's name)

• The End of exam

With my all best wishes

Hanaa Mansour

المستوى الثالث الفترة الصباحية الإجابة ١٦١٦١٦٠١



Kafrelsheikh University
Faculty of Science

Second term
2015-2016

Time: 2 hours
Subject: Desert ecology and
Egyptian fauna
70 marks

Third level(zoology)
Date: 6-6-2016

Answer the following questions: (70Marks)

1- Write short notes on: (50 Marks)

Desert ecology- adaptation- co-adaptation-mimicry- pre-adaptation-
fitness landscape- Extinction- acclimatization- adaptation to hot
climates- competition.

2- Define the following words: (10 Marks)

Relative fitness- habitat- population- community.

3- Complete these sentences: (10 Marks)

In the desert ----- is an important factor contributing to -----.

In some deserts, -----, exceeds -----.

----- in open country also contributes to-----.

With best wishes,

Dr. Alyaa Gazzy.



أجب عن الأسئلة الآتية:

Q.1.

Find the equivalent Volterra integral equation to the following initial value problem :

$$y''(x) + y(x) = \cos x, \quad y(0) = 0, \quad y'(0) = 1 \quad (14)$$

Q.2

Solve the Fredholm Integral equation :

$$u(x) = \sec^2 x - 1 + \int_0^{\frac{\pi}{4}} u(t) dt. \quad (14)$$

Q.3.

Solve the integro-differential equation

$$u''(x) = \cosh x + \frac{1}{4} - \frac{1}{4} \cosh 2x + \int_0^x \sinh t \, u(t) dt \quad (14)$$
$$u(0) = 1, \quad u'(0) = 0$$

Q.4.

Solve the following Integral equation by series

$$u(x) = x \cos x + \int_0^x t u(t) dt \quad (14)$$

Q.5.

Find the solution to the following Abel's problem

$$\pi x = \int_0^x \frac{u(t)}{\sqrt{x-t}} dt \quad (14)$$



Answer the following equations:

Question (1):

(17.5 marks)

a) Define polymer, macromolecule, polymer molecule, soft matter, complex fluid and cohesive energy density?

b) Classify and explain the chemical compounds according to your

Question (2):

(17.5 marks)

Show how you can categorize the chain structures of polymers explaining the physical meaning of molecular self-assembly process?

Question (3):

(17.5 marks)

a) Write-down the factors on which the semi- flexibility of polymer chains depend?

b) Explain one of their models?

Question (4):

(17.5 marks)

a) Explain the characterization of polymer's molecular weights?

b) Define and explain three of the topological architectures of polymers?

The End of exam

أ.د. رياض عبد الوهاب خازي

Time: 2hrs

Monday, June 06, 2016

Faculty of Science, Kafrelsheikh University

Total Marks 35

Surface Chemistry Exam For Third Year Students



Answer All Questions

1. The solubility of oxygen gas in water at 25 °C and 1.0 atm pressure of oxygen is 0.041 g/L. The solubility of oxygen in water at 3.0 atm and 25 °C is _____ g/L.
2. The freezing point of ethanol (C_2H_5OH) is -114.6 °C. The molal freezing point depression constant for ethanol is 2.00 °C/m. What is the freezing point (°C) of a solution prepared by dissolving 50.0 g of glycerin ($C_3H_8O_3$, a nonelectrolyte) in 200 g of ethanol?
3. When solutions of strong electrolytes in water are formed, the ions are surrounded by water molecules. These interactions are best described as a case of _____.
4. When 1.00 mole of a nonvolatile weak electrolyte is dissolved in 1.00 kg of benzene, a solution with a volume of 1.21 L is formed. If the solution freezes at a temperature that is 2.6 °C colder than pure benzene, determine the osmotic pressure at 298 K of this solution in atm. K_f for benzene is 5.10 °C/m.
5. A solid does not conduct electricity, but its melt does. The crystal is brittle and hard, and soluble in water. Thus, it is: _____.
6. In any cubic lattice, an atom lying at the corner of a unit cell is shared equally by how many unit cells?
7. Number of atoms in a unit cell of BCC, FCC and SCC metals are _____.
8. The average osmotic pressure of blood is 7.7 atm at 25 °C. what concentration of glucose, $C_6H_{12}O_6$, will be ?
9. A solution of an unknown nonvolatile nonelectrolyte was prepared by dissolving 0.250 g in 40.0 g of CCl_4 . The normal boiling point of the resultant solution increases by 0.357 °C. calculate the molar mass of the solute.
10. A solution contains 'a' moles of component 'A' and 'b' moles of component 'B'. What will be the mole fraction of component 'B' is _____.
11. 10 gms of a solute is dissolved in 90 gms of a solvent. Its mass % in solution is ?
12. An example of colligative property is _____.
13. Acetone (5 ml) is mixed with 100 ml water. The vapour pressure of water above the solution will be _____.
14. The crystal structure of caesium chloride is a _____.
15. Which of the following type of cubic lattice has maximum number of atoms per unit cell?

Kafr Elsheikh University
Faculty of Science



Time allowed: 2 hours

2nd Term 2015/2016

Level: Three
Program: Chemistry

Surface & colloidal
Chemistry

Answer the following questions:

First question

- a) Write in details about methods of preparation of disperse systems.
- b) Discuss the factors affecting particle growth.

(15 marks)

Second question

- a) Predict the factors affecting Brownian motion of colloidal systems.
- b) Define (Tyndall effect – Rayleigh scattering). Why fog lights are always yellow or orange?

(10 marks)

Third question

- a) Define (surfactant – CMC), and give short notes on the factors affecting CMC.
- b) Sketch a simple diagram of the scanning electron microscope (SEM) and compare between the optical microscope, SEM and TEM.

(10 marks)

Best wishes..

Answer the following questions

1st Question

A- Complete the missing parts: (13 points)

- 1) The large of roots and their ability to absorb at low concentrations from the soil solution make mineral absorption by plants a very effective process.
- 2) means that some mineral nutrients can be applied to the leaves as sprays, and characterized by and
- 3) The fourth group has important roles in
- 4) Inorganic solid soil phase provide a reservoir of, And but, organic solid phase contains, and
- 5) When cations of lesser charge replace Al^{3+} and Si^{4+} , inorganic soil particles become Mineral anions such as nitrate (NO_3^-) and chloride (Cl^-) remain dissolved in the soil solution because they
- 6) The ability of plants to obtain both water and mineral nutrients from the soil is related to their capacity to develop
- 7) High levels of ammonium are toxic to both plants and animals because
- 8) Three-domain model for nitrate reductase which are, And
- 9) The chemical potential for any solute is defined as the sum of the concentration,, andand this could be expressed by the following equation.....

B- Define each of the following (12 points)

- > Nutrient depletion zone
- > Nitrification
- > Mineral assimilation
- > Nutrient solution.

2nd Question

A- Write short notes on the following (25 points)

- 1) Soil pH affects mineral availability and root growth.
- 2) Different areas of the root absorb different mineral ions.
- 3) Fertilizer
- 4) The differences between the physiological roles of both sulfur and calcium.
- 5) The differences between the symptoms due to deficiency of both manganese and iron.

باقى في الملف →

B- Discuss each of the following (20 points)

- 1) Channel transporters enhance ion and water diffusion across membranes.
- 2) The assimilation process of nitrate in plants.

Best Wishes



Kafrelsheikh University

Faculty of Science

Department of Botany

Third year students (Botany)

Climatology (35 degree)

1- Complete the following sentences: (18 degree)

- a- The atmosphere is divided into several layers areand.....
 - b- Convection heat loss isand expressed by
 - c- Conduction is
 - d- Heat budget is
 - e- The response of an organism to temperature is affected by 1,2,3,4,5,6,7,8,and 9
-

2- What is the different between the following : (17 degree)

- a- Heliophytes and Sciophytes.
 - b- Microclimate valleys and city.
 - c- The Stefan-Boltzmann law and the Wien displacement law.
 - d- Threshold and biological clock.
 - e- Discuss the ways to save the world from the climate changes and recommendations.
-

Prof. Dr. Mohamed El-Beheiry



Answer the following question (70 degree)
Illustrate your answers with diagrams where necessary

- 1- What is *Giardia* and how is it spread? What are the symptoms ? How does it get diagnosed? How is it treated?
- 2- Name some protozoa that move by cilia? State in short about life cycle and pathogenesis of *Trichomonas vaginalis* .
- 3- What are symptoms of malaria? Write its control measures. Describe life cycle of *Plasmodium* where gamete formation occur?
- 4- What is African sleeping sickness? How is it caused? Describe its transmission and pathogenesis. Suggest methods for its control.
- 5-What is Toxoplasmosis? Causes and symptoms? How can I prevent toxoplasmosis? .
- 6- What is *Paragonimus*? How is *Paragonimus* transmitted? What are the signs and symptoms? How prevent *Paragonimus* infection?
- 7- Give the different species of *Schistosoma* responsible for disease in man? Why *Schistosoma* differs from other trematodes? Describe the life cycle of *Schistosoma mansoni*? What are the signs and symptoms of schistosomiasis? How is schistosomiasis diagnosed?



ANSWER THE FOLLOWING QUESTIONS

1. Describe the Total Station and its applications? (10 marks)
2. Write with illustration in the parts of Brunton Compass. (15 marks)
3. Compare between thermal (or intrusive) contact and tectonic contact. (5 marks)
4. What is the GIS process or cycle? (5 marks)
5. **What is meant by (definition only):** (15 marks)

- a). True Meridian and Magnetic Meridian
- b). Bearing and Azimuth
- c). GPS
- d). GIS
- e). Magnetic Declination

6. Complete the following statements (20 marks)

- a). occurs when the GPS signal is reflected off objects such as tall buildings, but is an intentional degradation of the signal once imposed by the U.S.
- b). When the sighted point is visible from the level of, read the bearing indicated by the White end of the needle, but when the sighted point is visible at, read bearing on White end of the needle and transpose the direction of bearing before recording.
- c). Difference in elevation may be measured by levelling, and levelling, and levelling.
- d). Xenoliths of rocks or minerals inside the host rocks in the outcrops suggest that these xenoliths are than the host rocks.



Answer the following equations:

Question (1):

(17.5 marks)

Name the molecular models and explain one of them?

Question (2):

(17.5 marks)

Define the molecular elements of symmetry and explain one of them?

Apply these elements upon water molecule or Boron trifluoride molecule?

Question (3):

(17.5 marks)

Define the concept of the null- gap of a vibration- rotation spectra of a hetero- diatomic molecule?

Question (4):

(17.5 marks)

The observed vibrational frequency of iodine(I_2) molecule is 213 cm^{-1} . Knowing the mass of each iodine atom $m=21.08 \times 10^{-26} \text{ kg}$, calculate the elastic constant of the molecule?

The End of exam

أ.د. رياض عبد الوهاب غازي

المستوى الثالث
الفترة الصباحية
الصفحة ١١٦/١١٧/٢٠١٦

Kafr Elsheikh University
Faculty of Science



Level: Three
Program: Chemistry

2nd Term 2015/2016

Chromatographic methods

Time allowed: 2 hours

Answer the following questions:

First question

Sketch the gas chromatography instrumentation and write short notes on the main factors should be considered in the GC experiment.

(10 marks)

Second question

- Discuss chemical methods of location of separated spots in TLC.
- Describe factors affecting the migration rate in electrophoresis.

(20 marks)

Third question

Compare between each pair of the followings:

- Silica gel and alumina as adsorbents in TLC.
- Two-dimensional and radial techniques.

(20 marks)

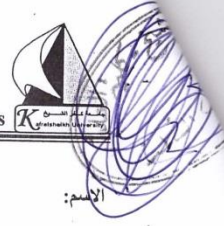
Fourth question

- Write short notes on the types of ionic exchange resin and capacity of ion exchanger.
- Give the reason for:
 - In TLC, atmosphere of the used tank should be saturated with mobile phase before starting the experiment.
 - In gradient elution, MP of more than two solvents should be avoided.

(20 marks)

Best wishes...

۲۲۴ عزیز اید سے م



الرقم الكاديمي

الاسم:

Second part: Vertebrate paleontology (35 marks)

I- True or False: (16.5 marks)

- 1) 1st whale bone were found in Wadi El Hitan site.
- 2) Whales are artiodactyls.
- 3) Many chordates, which include fish, sharks, rays, and amphibians, are not amniotes.
- 4) Rocks of Egypt contain Ambulocetus fossils.
- 5) In deuterostome, the blastopore gives rise to anus.
- 6) Mesozoic is the age of dinosaurs.
- 7) Mammals dominated Pangea 250 million years ago.
- 8) *Basilosaurus* was fully aquatic tail-powered swimmers that has strong hind limbs.
- 9) Some of early fishes were heavily armoured.
- 10) Egyptian fossil whale are fundamental for understanding the early evolution of archaeocetes.
- 11) *Moeritherium* is an ancestor of modern elephant and lived in Egypt during the Oligocene.
- 12) Bone is made from mineral and protein components.
- 13) *Aegyptopithecus* is a monkey lived in Fayum 30 million years ago.
- 14) Reptiles are ectothermic (cold-blooded) that rely on external heat.
- 15) *Spinosaurus* is a saurpodomorph dinosaur lived in Egypt 90 million years ago.
- 16) Whale ancestor was walking on the land. •
- 17) Fish become abundant only in the Devonian (417–354 Myr)
- 18) Synapsids are mammal-like reptiles lived during the end of Paleozoic.
- 19) The first true mammal fossils found in the Paleozoic.
- 20) Kellog1936, Gingerich et. al.1990, and Uhen1998, recognize in group Archaeoceti, three families: Protocetidae, Dorudontidae and Remingtonocetidae.
- 21) *Dorudon* has hind limb using them for walking.
- 22) The earliest remains of fishes are from the Cambrian
- 23) *Tiktaalik* has a mobile neck and a wrist that could bend.
- 24) *Archaeopteryx* is the Oldest bird
- 25) Wadi El Hitan contains only two whale species : *basilosarus* and *dorudon*
- 26) Ichthyosaurs, Plesiosaurs, Mosasaurs are a marine reptiles.
- 27) Rocks of Egypt, contains Protocetus atavus and Eocetus schweinfurthi.
- 28) Wadi El Hitan the 1st nature world Heritage in Egypt
- 29) Bahria Formation is Jurassic in age and famous for dinosaurs.
- 30) Vertebrates are members of a larger phylum termed chordate.
- 31) *Basilosaurus isis* has hind limb using them for walking.
- 32) Paleontology is the scientific study of prehistoric life
- 33) Whales of Wadi El Hitan used to walk.



III- Answer the following questions: (8.5 marks)

1- Why we study fossils? (2.5 marks)

.....
.....
.....
.....
.....
.....
.....
.....
.....

2- When did this happen? (3.5 marks)

- Origin of the Earth:Myr
- Origin of life: Myr
- First fishes: Myr
- First tetrapods:Myr
- First reptiles: Myr
- First archosaurs: Myr
- First dinosaurs: Myr

3- Mention the most important vertebrate field localities in Egypt? (2.5 marks)

.....
.....
.....
.....
.....
.....



11- Fossilized whales can be found in,

- a) Siwa
- b) Wadi El Hitan
- c) both

12- Amniotes are divided into three main groups (anapsid, diapsid and synapsid) based on...

- a) how many holes they have in the skull
- b) how many eggs they lay
- c) how many limbs they have

13- Archosaurs include

- a) crocodiles, birds and dinosaurs
- b) crocodiles, birds and lizards
- c) crocodiles, birds and snakes

14- Dinosaurs appeared in the

- a) Late Triassic
- b) Later Jurassic
- c) Later creataceous

15- The word Dinosaur means

- a) terrible lizard
- b) big crocodile
- c) hungry reptile

16- The first whale bone were found in

- a) Fayoum
- b) Sinai
- c) New valley

17- Theropods are dinosaurs

- a) flesh eating
- b) plant eating
- c) both

18- Sauropodomorphs are dinosaurs

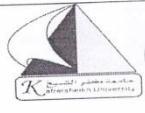
- a) long necked
- b) Plant-eating
- c) Both

19- Ichthyosaurs, Plesiosaurs, and Mosasaurs are

- a) Dinosaurs
- b) Marine reptiles
- c) Flying reptiles

20- The biggest carnivore dinosaurs is

- a) Argentinosaurus
- b) Spinosaurus
- c) Carcharodontosaurs

<p>امتحان الفصل الدراسي الثاني (٢٠١٥-٢٠١٦) مقرر : نظرية القياس - ورقة واحدة الزمن : ساعتان الدرجة العظمى (٧٠)</p>		<p>مقر الشيخ قسم الرياضيات في الثالث - رياضيات الامتحان الخريفي ٢٠١٦/٦</p>
---	---	--

ب على الأسئلة التالية :

١ (أ) أثبت أن : $\alpha = \{A_n = (\frac{10}{n+1}, 10), n \in N\}$ هي غطاء مفتوح للمجموعة $A = (0, 10)$.

(ب) لتكن $A_n = (\frac{-1}{n}, \frac{1}{n}), n = 1, 2, \dots$ بين ما إذا كان الاتحاد والتقاطع لها هو مجموعة مفتوحة أو مغلقة .
(٢٠)

(أ) طبق مفهوم تكامل ريمان في حساب قيمة التكامل : $\int_0^1 (1+x)^2 dx$

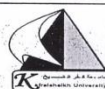
(ب) اوجد المشتقة : $\frac{d}{dx} (\int_{\pi}^{x^2} \frac{\tan t}{t} dt)$
(٢٠)

(أ) لتكن \mathcal{R} حلقة فائيت : $(i) \phi \in \mathcal{R}, (ii) A \Delta B \in \mathcal{R}, (iii) A \cap B \in \mathcal{R}$ حيث $A, B \in \mathcal{R}$

(ب) أثبت أن $f(x) = \frac{1}{\sqrt{1-9x^2}}$ قياسيه .
(٢٠)

طبق مفهوم ريمان للتكامل في اثبات : $\int_a^b \lambda^x dx = \frac{1}{\ln \lambda} (\lambda^b - \lambda^a)$
(١٠)

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



Q1: (15 degree)

Prove that the energy of a particle depend on the Semi- major axis of the orbit.

Q2: (15 degree)

Prove that the angular momentum of the orbit depend on the eccentricity.

Q3: (20 degree)

According to the four quantum number (n, l, m_l, m_s) write the electron configuration of Argon whose $Z=18$.

Q4: (20 degree)

a) Write Schrodinger's equation in spherical coordinates.

b) By separation of variables of Schrodinger equation in polar coordinates, prove that the electron angular momentum equal $L = \{ \hbar/2\pi [l(l+1)]^{1/2} \}$

The End of exam

With my best wishes,

Dr. Atef Elbendary