المستوى الرابع - كيمياء وحيوان - أجنة تجريبي (ع ٤٠٣)

Mansoura University	**Educational year: First Term**
Faculty of Science	**Year: Fourth Year**
Zoology Department	**Date: 25/1/2012**
Program:	**Time Allowed: 2hrs**
Subject: Z 403	**Full Mark: 60 Marks**
Course(s): Experimental Embryology	**Final Exam**

Attempt all the following questions

Part 1)- MCQs: 15 minutes 9 Marks

(A) Please select the **single best answer** for each of the following questions:

1-Presence of a single extra chromosome is called:
A.Trisomy
B.Monosomy
C.Triploidy

2-Turner syndrome results from:
A.Trisomy of X-chromosome
B.Presence of an extra Y-chromosome
C.Monosomy of X-chromosome

3-A person with Down syndrome has three copies of chromosome:
A.X
B.16
C.21

4- A fetus is aborted in mid pregnancy. Chromosome analysis shows it to be triploid with an XYY sex chromosome constitution. Which single event could account for the abnormality?
A. Polyspermy
B. Polygyny
C. Nondisjunction

5- The "common name" of the instrument that sterilizes tissue culture equipment?
A.Autoclave
B.Steam champer
C.Pressure cooker

6-Arrange the following developmental events in proper sequence:

A. Ovulation
B. Sperm penetrates zona pellucida
C. Male pronucleus formation

7-Which type of cloning involves separating cells from the same embryo to produce multiple offspring?
A.Natural cloning
B.Fusion cell cloning
C.Embryo transplants

8-What medical application could embryonic stem cells be used for?
A.Improve intelligence
B.Replace damaged tissue
C.Speed up digestion

9- One advantage of therapeutic cloning is that:
A.The donor cells will be rejected by the recipient's body
B.The donor cells will not be recognised as foreign by the recipient's body
C.The donor cells come directly from the recipient's own body

10- In humans, fertilization usually occurs in the
A. Oviduct
B.Ovary
C.Uterus

11-A teratogen is any agent that can induce or increase the incidence of a congenital malformation in an embryo:
True or False
12- Men and women are equally likely to have fertility problems.
True or False

13- In vitro fertilization (IVF) is a simple, cost-effective procedure for infertile couples.

True or False

14- The acrosome reaction is associated with the release of acrosomal enzymes that facilitate fertilization.

True or False

Part II: Fill in the spaces 15 minutes 9 Marks

1-Normal differentiation pathways of adult stem cells is----------

2-What diseases can be cured by Stem Cell Therapies------
3-Unique properties of stem cells-------
4-Semen Analysis is-------
5-IVF&ET can be a suitable management for infertile couples suffering from the following problems: a.---------- b.----------

6-Complications of IVF are a.----------b.----------

Part III Definitions and Short Answer 90 minutes

(1) Discuss Three on the following: 30 minutes 12 Marks

1-Defects which caused by:
a- Thalidomide and b-Herpes Simplex Virus

2-Compare between maternal disease (Phenylketonuria) and radiation as main cause of malformations?

3-Role of Sertoli cells (Hormonal control)

4-Transfer of fertilized egg into the uterus

5-Differeniate between micro fertilization of human egg & IVF?

(2) Illustrate eight of the following definitions: 30 minutes 15 Marks

a.Epimorphosis
b.Meromelia
c. Amniocentosis
d. Cranioschisis
e. Spina bifida occulta
f. Meningoencephalocele
g. Clup foot
h. Translocation
i. Deletion
j.Synophthalmia

(3) Write short accounts on three of the following: 30 minutes 15 marks

a.Cellular immunity

b.Regeneration of lens

c.Kidney abnormalities

d.Numerical chromosomal abnormalities

Good Luck

Prof. Dr. Hassan El-Sayad

Dr. Heba EL-ghaweet

Prof. Dr. Amoura Abou-El-Naga

Prof. Dr. Mohamed Hassan

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

جامعة المنصورة
كلية العلوم
قسم الكيمياء
المنصورة – مصر

Educational Year: 4th Year Chem. Botany& Chem. Zoology.
Course (s): Photochemistry& Organic spectroscopy.
Date: 29/12/2012.
Course Code: CH 431.

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

Answer the following questions

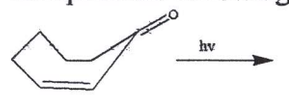
1.

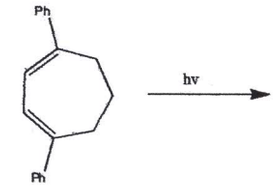
a) Write brief account on (Fluorescence – Phosphorescence – Intersystem crossing). (7.5 Marks)

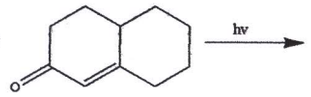
b) Write on cyclisation reactions of conjugated olefins and explain your answer by examples for each. (7.5 Marks)

2.

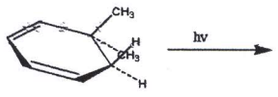
a) Complete the following photochemical equations. (7.5 Marks)

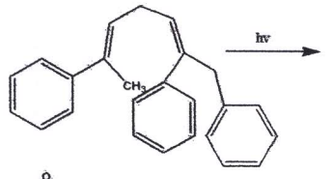
1) 

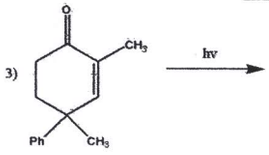
2) 

3) 

b) Complete and suggest the suitable mechanism for the following equations. (7.5 Marks)

1) 

2) 

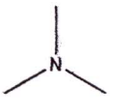
3) 

3.

a. How would you use IR spectroscopy to distinguish between the following compounds(5 Marks):

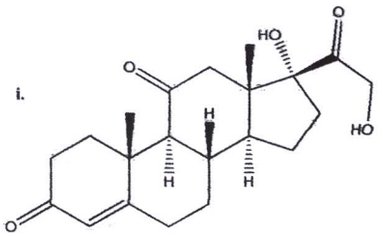
i. 

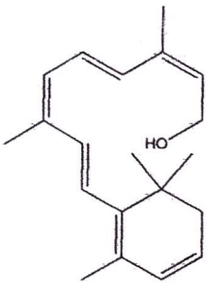
ii. 

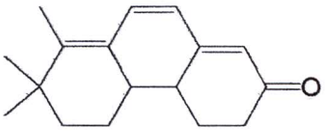


iii. 

b. Calculate λ_{max} for each of the following(5 Marks):

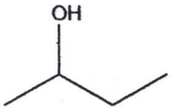
i. 

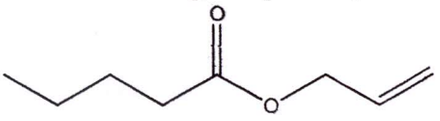
ii. 

iii. 

c. Show the expected mass fragmentation pattern for the following compounds(5 Marks):

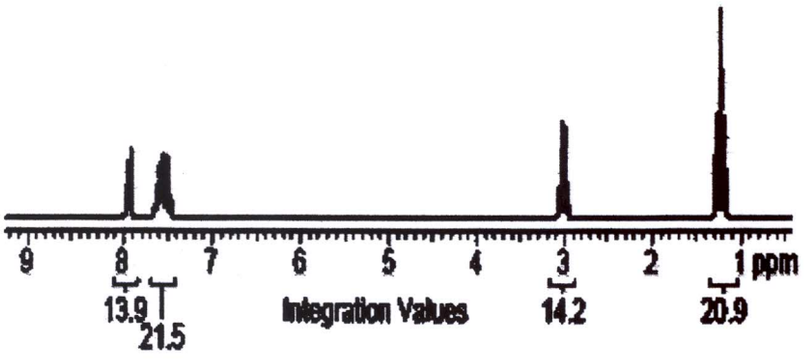
i. 

ii. 

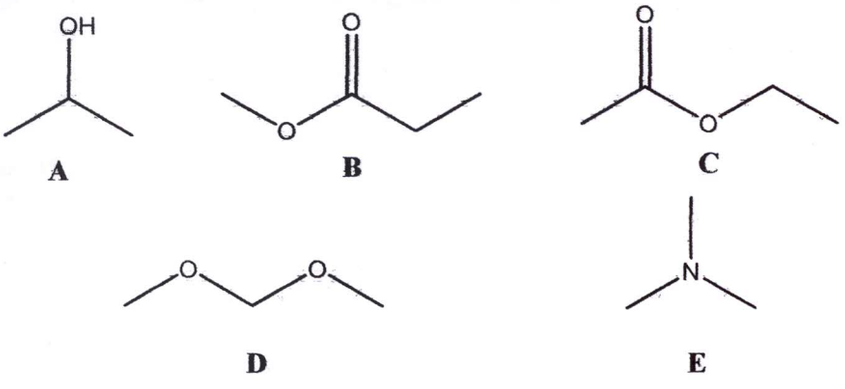
iii. 

4.

a. Propose a structure that is consistent with following ^{1}H NMR spectra provided that the molecular formula is $C_9H_{10}O$ (5 Marks):.



b. Consider the following molecules, **A** – **E** (10 Marks):.

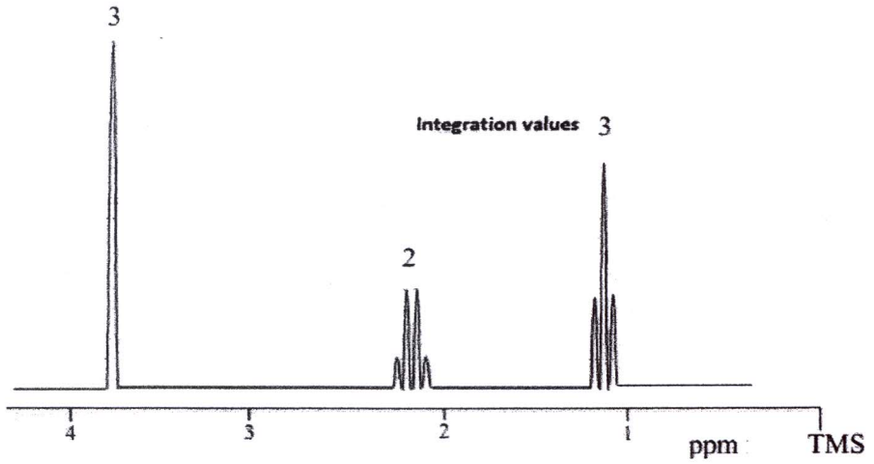


A **B** **C**

D **E**

More than one answer may be correct. <u>GIVE ALL CORRECT ANSWERS.</u>

1) Which of the molecules would give three signals in the ^{1}H NMR spectrum?
2) Which of the molecules would possess a ^{1}H NMR spectrum consisting of only one signal?
3) Which of the molecules would possess a ^{1}H NMR spectrum consisting of two signals in the ratio 1:3?
4) How many singlets would be observed in the ^{1}H NMR spectrum of **D**?
5) Which of the molecules would possess a ^{1}H NMR spectrum containing a singlet, a triplet, and a quartet signal?
6) Examine the ^{1}H NMR spectrum below. To which of the compounds does it belong?



Examiners

Prof. Dr. Mohamed Abou-Elzahab **Dr. Saad Shaaban**

المستوى الرابع - كيمياء/حيوان ٢٠١٣ - تلوث بيئي وتحاليل بيولوجية

University of Mansoura
Faculty of Science
Zoology Department

جامعة المنصورة
كليـــة العلـــوم
قسم علم الحيوان

First Term Examination (January 2013)

Educational year: Fourth Level
Program: Chemistry/Zoology
Date: 1 January 2013
Time: 2 hours

Course (s): Environmental pollution & Biological analysis (Z405) (Optional)
Full Mark: 80 Marks

Q_1- Answer as true (✓) or false (X) **[20] Marks**

1. Nanotechnology is research and development to control or manipulate matter on molecular or atomic scales, with lengths 1-100 nanometers (nm)
2. Procedure of bioanalysis is sample preparation, instrumentation and software
3. Ecology includes all organization levels from organisms to biosphere
4. Separating funnel is used in liquid-liquid extraction technique
5. Pollution is introduction of contaminants (foreign and naturally occurring substance/energies) into the natural environment that cause adverse change
6. Trypsin is extracted from *Saccharomyces* and used in confectionery
7. Any chromatography system is composed only of stationary phase and mobile phase
8. Decomposers harvest energy from the sun by photosynthesis and break organic matter back into its inorganic constituents
9. Oil spill causes water pollution but not soil pollution
10. The amount of a chemical produces death in 50% of a population of test animals is LC_{50}

Q_2- Choose the correct answer: **[20] Marks**

1. …… is a graph showing the detector response as a function of elution time

   a) cephalogram b) chromatogram c) cardiogram

2. A hazy layer called …… may hang over industrial cities indicates to air pollution

   a) smog b) fog c) smut

3. Toxicity tests aim at identifying hazards to humans are generally referred to as ……

   a) end point b) safety c) ecotoxicity

4. ..... is a technique of instrumentation

   a) protein precipitation b) centrifugation c) spectrophotometry

5. Survival and reproduction are biomarkers at the ..... organization level

   a) cells b) individual c) community

6. Ecosystem is a core concept in ..... and Ecology

   a) biology b) geology c) histology

7. 1 enzyme unit (1 U) = ...

   a) 1 mmol min^{-1} b) 1 nmol min^{-1} c) 1 µmol min^{-1}

8. ..... confirm diagnosis of acute or chronic disease as cancer tumors

   a) biomarkers b) bioindicators c) bioassays

9. ..... is a tool may detect disease in a very small amount of cells or tissue

   a) nano-engineering b) nano-device c) nano-science

10. ELISA is ..... technique

    a) an immunological b) enzymatic c) both of them

Q_3- Give a detiled account on: **[25] Marks**

1. Factors affecting toxicity
2. Ecosystem function (processes) with reference to biogeochemical cycling

Q_4- Compare between both of: **[15] Marks**

1. Liquid chromatography and gas chromatography
2. Nano-world and micro-world
3. Effects of air pollution and water pollution on human health

..... Good Luck .....

Examiner

Dr. Waleed Khaled Elaidy

المستوى الرابع - كيمياء وحيوان - ج ٢٠٨ علاقات بيولوجية وسلوك

Mansoura University
Faculty of Science
Zoology Department

Academic year: 4th level
Program: Chem.&Zoology
Course: Animal beh. &
Biotic association
Coud: Z408
Full Mark: 60 Marks

Date: 1/1/2013
Time: 2 hr

Answer **all** the following Questions:

I-Complete the following sentences: **(20 mark)**

A- The aptitude to practice any beh. action carries on ....., every beh. action has ..... on ..... , this aptitude rises in ..... after ..... , then it ..... gradually with the ..... in beh. action.

B- In the honey bee, competition is between ..... to reach ..... during ..... but only the ..... will .....

C- Learning is the ..... of keeping .....in special places of the brain, it is called ..... . Learning through thinking of prababilities called .....

II- A- Are the following statements true or false rewrite the fates stat. **(10 mark)**

1. In Commensalism the host is not infured by the "C".
2. By reaching 2 weeks age, a worker begings nursing of the young.
3. Reflexes is every spontaneous response happens in a limited shape.
4. Metabolic interaction occurs in predatism.
5. Tactile receptors are found under epidermis and are sensitive to I.R. ray.
6. As for aquatic funa R.H. is replaced by acidity.
7. Receptors transfer the receptive organ reaction translate it and release the suitable sign.
8. Silk worm weaves accurate cocoon although it didn't see others do this work (acquired beh. action of instin. part).

B- Write the scientific expression for the following statements: **(10 mark)**

1. A special case of predatism inside intra specific B.A.
2. Both partners live separately.
3. A picture case of bengin endoparasitism among mammals.
4. A predator can usually live on 2 or more prey-spp.
5. Host is not available, the parasite it's development

III- Discuss: **(20 mark)**

A- Learning is based on the use of past experience results.
B- Groups of mutualism.
C- Rare cases, competition may be useful.

IV- Write an essay on an useful or harmfaul insect.

Best wishes
د./ محمد عزت

Examiners:
د./ هبة الغويط
أ.د/ هدى عبد الحسيب
د./ هدى سالم

المستوى الرابع كيمياء وصراعه . التحليل الكهربي والتحليل الطيفي ٢٠١٥

Mansoura University
Faculty of Science
Chemistry Department
Subject: Analytical Chemistry
Course: **electroanalytical and Spectrometry .....**
Course code: 314 415

4th level(Chemistry students)
Date:5-1-2013
Time allowed: **2** hours
Full Mark:**80** Marks

Answer the Following Questions

A-**Spectrometry** (40 marks)

1-What is colourimetry ? what are the basic components of single and double beam spectrophotometer .

2-How can analyse a coloured compound by spectrophotometric method .

3 - what are the types of emission spectra . Discuss

a- absorption or emission b- nonradiative relaxation c- Fluorescence

4-If a 3.9x10-4 M solution of compound A (Molecular weight = 122) exhibited an absorbance of 0.624 at 238nm in a 1- cm cuvet .A blank had an absorbance of 0.029 .The absorbance of the unknown solution of compound A was 0.375 at the same wavelength .Find the concentration of A in the unknown expressed in g/l .

5- How can choice the method of analysis between the following techniques

i) Turbidometry . ii) Nephelometry .

what are the differences between Nephelometry and Fluorimetric techniques .

6- Explain how atomic spectroscopic methods are categorized based on the type of atomization process . Explain shortly the type of interferences in flame AAS and the ways their elimination .

Answer ALL Question only and express your answer by equation, diagram: with formula ,equation ,figures whenever possible

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Section Electro-analytical chemistry (40 marks)

1-a)Define *5 only* of the following : (10 marks)

1- Faraday 's 2nd law , α (conductance) **2-i_d. &i_p 3- E_{cell} & E_j** 4-Cyclic voltammetry 5- Back titration in Coulometry with control potential 6- Anodic stripping analysis 7-$E_{1/2}$ & $\Delta E_{1/2}$. 8-Λ_{eq} & Kohlrauch law

b) Discuss *2 only* of the following sentences: (10 marks)

1-Electro-deposition depend on several factors& has many applications.

2 -Dropping Hg electrode has many advantages & polarography analyses very useful in analytical chemsitry ,O_2 removed from analytic solution in polarographic cell .

3-Ions – molecular selective electrode are versatile.

c) A mineral sample 500.0 mg containing stibnite Sb_2S_3 is decomposed and dissolved in acid and diluted to 100 ml .A 5.0 ml aliquot is added to 150 ml of an electrolyte containing 2 M HCl and 0.2 M KBr. Electro-generated bromine oxidizes Sb^{+3} to Sb^{+5} and the coulometric titration requires 200.0 sec. At 50.0 mA to reach the end point signal . Calculate the % of Sb & Stibnite Sb_2S_3 in the sample. (At. Wt. Sb =122, S = 32). : (10 marks)

d) complete 4 only the following: (10 marks)

1- $E_{1/2}$= .....for E_c = -0.66 v. and E_a = -0.64 v. and the number of electrons=.... for organic compound (cyclic voltammetry).

2- Controlled potential coulometry used for analysis of .....and determine no of .....

3- Using coulometry with constant current for determination of ..... and produce .....

4- Equivalent conductance Λ° are .....and depends on ..... while Λ° is .....

5- Quantitative analysis in polarography technique depends on ..... using .....and ..... methods. while, qualitative analysis depends on .....

Good Luck : prof. Dr. I. Kenawy

المستوى الرابع . كيمياء وحيوان . تشريح 2 ح ٤٠١

Mansoura University
Faculty of Science
Zoology Department
Subject: Zool. 401

First Term
Date 12 /1/2013
Final Exam. Of Comp.Anat
Forth level Chemistry & Zoology
Time Allowed / Two hours

Answer the following Four questions   Full mark (60)

Q1- Fill in the spaces with right words (20 Mark half for each space)

a- In relation to the coelom , the kidney is a -------- organ, its concentrating ability depended upon the ------ and ------ of glomerulus , the length of ------ and ------, the thickness of -------.

b- The salt gland specific to ---- and ---- , it eliminates excess ---- from the blood , it consists of groups of ---- each one contain ---- from which excretory tubules radiated. Their epithelial cells are ---- and-------.

.c- The upper temporal arch formed of ---- and ---- while the lower arch formed of ----- and ------.

d-The organ which formed dentine is ----- and the types of dentine are

------, ------- and -------.

e- ------- is a serous membrane extend through the ------ from the body wall to the -----, it is a site for the storage of ------ and transmit of -----and ------.

f- The second splanchnic arch named ----- and formed of three pieces including -----, ------ and ------ respectively.

g- Two chambered heart named ------ and characteristic to class --------, --------- and ------.

h- Rootless teeth known as ------ which may be ------ as in ------ or ----- as in ---------.

Q2- Correct the underlined words 10 mark (half for each item)

a- Zygomatic arch specific for the skull of class **aves** with the exception of order **rodetia** which includes **rats and mice.**

b- Temporal bones confined in the **roof** of the **capsule** , it represented in all classes by **frontal** only.

c-Venous circulation may be **aortic or splanchnic** in which the later includes hepatic , **intestinal and pharyngeal.**

d- The types of the principal (main) keratinized body covering of the first hot-blooded animals are **cycloid , ganoid and cosmoid** which performed **secretory and nutritive** functiond .

e- The keratinized structure which restricted to the ends of the digits includes in evolutionary order **spur , beak and hair** where the later present only in order **ungulates** .

Q3- choose from section A which fit with from section B (20 Mark).

A Spur found in - holocrine secretion occurred in- interparital characteristic to - lophodont specific to – acrodont characterized to- the origin of mallu is – apocrine happened in - truncus arteriosus present in - pleurodont specific to – uropygeal gland well developed in- armor plates characteristic to- prolong horn localized in – entrocoely occurred in – epidermis is - splenial belong to –the sweat gland is - diastema specific for- quadratojugal belong to- palatine bones formed- femoral scent glands perform-

B- all reptelia – mammals- Rhenocerous – marine aves only - ostracoderm - all herbivorous - antelop- all aves- fishes- horse only- secondary palate- sexual function- amphioxus- sweat gland- all aquatic birds- human being- sebaceous gland- liver- skull of mammals and extinct tetrapods- feeding function - skull of aves- articular - pancrease - horse and elephant- a tissue has no nerve or blood supply- carnivorous- some male birds only - mammary gland – lower jaw – cyclostomata - protective function- mucous gland- upper jaw- first tetrapods- lion- aramadillo- skull of mammals only- coiled tubular gland

Q4- Mention by diagram only with complete labeling (10 Mark)

a- The ontogeny of the main hollow muscular pump of the vertebrates.

b- The basic sequences of the mechanism for the formation of any hard structure.

c- Stages of the formation of body cavity in vertebrates.

Wish best wishes

Prof .Dr. Zeinab M. El Gohary

Mansoura University
Faculty of Science
Chemistry Department
Course: Physical Chemistry
Date : 15/ 01/ 2013

First term Examination
Subject: physical chemistry
Fourth Level
Full Mark : 60 Marks
Time Allowed : 2hours

Answer the Following Questions:

Section (A) Chemical Spectroscopy (30 Marks)

1.a) Write on :symmetric tops rotating molecules - angular momentum for rotation- interaction of radiation with rotating molecules -determination of moment of inertia and bond length for rotational spectra - rotation period **(10 Marks)**

b) Explain Hook's law and derive the fundamental frequencies for one paricle and two particles vibrating molecules . **(5 Marks)**

2. a) Explain the vibration spectra of CO_2 and $-CH_2$ group. **(9 Marks)**

b) The microwave spectrum of HBr shows a series of lines separated by 3.228 cm^{-1}. Calculate the moment of inertia and the internuclear distance in the molecule. **(6 Marks)**

($h=6.62x10^{-27}$ erg .S, $NA = 6.02x10^{23}$,atomic weights : H= 1,Br = 80).

Section (B) Surface Chemistry (30 Marks)

Q1- **Choose the Correct answer** **(15 Mark, one mark for each)**

1. During the adsorption of Krypton on activated charcoal at low temperature

(A) $\Delta H < 0$ and $\Delta S < 0$
(B) $\Delta H > 0$ and $\Delta S < 0$
(C) $\Delta H > 0$ and $\Delta S > 0$
(D) $\Delta H < 0$ and $\Delta S > 0$

2. The extent of adsorption of a gas on a solid depends on .....
(A) Temperature of the gas
(B) Pressure of the gas
(C) Nature of the gas
(D) All are correct

3. Which of the following characteristics is not correct for physical adsorption?
(A) Adsorption on solid is reversible.
(B) Adsorption is spontaneous.
(C) Adsorption increases with increase in temperature.
(D) Both enthalpy and entropy of adsorption are negative.

4. The work done in blowing a soap bubble of radius R is W_1 and that to a radius 3R is W_2. the ratio of work done is
(A) 1:3
(B) 3:1.
(C) 1:9
(D) 9:1

5. Rain drops are spherical in shape because of
(A) Surface tension
(B) Capillary
(C) Downward motion
(D) Acceleration due to gravity

6. The rise of a liquid in a capillary tube does not depend upon

(A) Angle of contact
(B) Density of the liquid
(C) Radius of the capillary tube
(D) Atmospheric pressure

7. The height of water in a capillary tube of radius 2 cm is 4 cm. what should be the radius of capillary, if the water rises to 8 cm in tube?

(A) 1 cm
(B) 0.1 cm
(C) 2 cm
(D) 4 cm

8. **Surfactants when present in a medium at low concentrations it called .....**

(A) micelles
(B) amphiphiles
(C) *Surface active agent*
(D) monomer

9. The surface of water in contact with glass wall is

(A) Plane
(B) concave
(C) convex
(D) Both 'b' and 'c'

10. Spreading of liquid on solid will occur if the work of adhesion is ..... the work cohesion

(A) >
(B) <
(C) =
(D) none of these

11. Surface tension may be defined as

(A) The work done per unit area in increasing the surface area of a liquid under isothermal condition
(B) The work done per unit area in increasing the surface area of a liquid under adiabatic condition
(C) The work done per unit area in increasing the surface is of a liquid under both isothermal and adiabatic conditions.
(D) Free surface energy per in it volume

12. The surface tension for pure water in a capillary tube experiment is

(A) $\frac{3g}{2hr}$
(B) $\frac{3}{hr\rho g}$
(C) $\frac{r\rho g}{2h}$
(D) $\frac{hr\rho g}{2}$

13. The height of a liquid in a fine capillary tube

(A) Increases with an increase in the density of a liquid
(B) Decreases with a decrease in the diameter of the tube
(C) Decreases with an increase in the surface tension
(D) Increases as the effective value of acceleration due to gravity is decreased

14. Rate of physisorption increases with

(A) Decrease in temp.
(B) Increase in temp.
(C) Decrease in pressure
(D) Decrease ion surface area

15. The equation of parachor is:

(A) $\frac{M}{D}\gamma^{1/8}$ (B) $\frac{M}{D}\gamma^{1/2}$

(C) $\frac{M}{D}\gamma^{1/6}$ (D) $\frac{M}{D}\gamma^{1/4}$

Q2- **Answer the following** **(15 Mark)**

1. *The adsorption data of gas on solid surface is represented as (P/V) against P, gives straight line with a slope = 0.0159cm^{-3}/g & intercept = 2.3torr.cm^{-3}.g , calculate the surface area of the solid (cross-sectional area of the gas molecule = 14.8x10^{-20}m^2* **(3 Mark)**

2. *The density of acetone is 0.791 at 20°C. If the parachor value of C, H,O , C = O bond is 7.2, 16.2, 20.0 and 23.2 respectively, then find out the surface tension of acetone.* **(4 Mark)**

3. *In the Du Nouy tensiometer, if the diameter of the ring is 1.0 cm and the force needed to pull the ring up (with the liquid attached to the outer and inner periphery of the ring) is 6.77 mN, what is the surface tension of the liquid?* **(3 Mark)**

4. *Mention only the equation of the following* **(5 Mark)**

   a- *Fowkes equation*
   b- *BET equation*
   c- *langmuir equation*
   d- *Work of adhesion & work cohesion*

With my Best wishes **Prof. Dr. Esam Gomaa**

Dr. Shady El-Dafrawy **Dr. Amr Awad**