



31.05.2018

((Assessment of the final exam for the second semester))  
Academic year 2017 -2018

45

Q1/ Integrate the following functions ( answer 5 only ): (20 marks)

1)  $\int \sin(2x) dx$     2)  $\int \frac{x-2}{(x-1)^2} dx$     3)  $\int (x^2 + 1)e^{-x} dx$   
4)  $\int x(x+5)^{10} dx$     5)  $\int xe^x dx$     6)  $\int \sec^4(x) \tan^2(x) dx$

Q2/ Give one example for *Diagonal matrix, Square matrix, Upper triangular matrix, Skew Symmetric matrix and Row matrix.* (10 marks)

Q3/ If  $A = \begin{bmatrix} 2 & -1 \\ 4 & 0 \\ 5 & 3 \end{bmatrix}$ ,  $B = \begin{bmatrix} -3 & 0 & 4 \\ 5 & 2 & -1 \end{bmatrix}$  and  $C = \begin{bmatrix} 2 & -2 & 1 \\ 3 & 4 & 6 \end{bmatrix}$ . (6 marks)

Find the following (answer 2 only):

1)  $2A - B$ .    2)  $2(B + C)$ .    3)  $A^T - C$ .

Q4/ A: Find the value of  $K$  which satisfy the equation  $\begin{vmatrix} 2 & -K & 0 \\ 1 & 2K & 4 \\ -1 & 2 & 5 \end{vmatrix} = 71$  (4 marks)

B: If  $A = \begin{bmatrix} 0 & -2 & 1 \\ 3 & 4 & 8 \\ 1 & 2 & 3 \end{bmatrix}$ , find  $A^{-1}$ . (8 marks)

Q5/ Solve the following systems by using Gramer's rule : (12 marks)

1)  $x + 2y - z = 3$   
 $-x - y = -4$   
 $y + 2z = 5$

2)  $3x - y = 9$   
 $x + 2y = -4$



\*\*\*\*Best luck\*\*\*\*

Lecturer  
Majed kamil

Head of Department  
Asst. prof. Dr. Riyadh Jaleel Nahi



((Assessment of the final exam for the second semester))  
(Academic year 2017- 2018)

23.05.2018

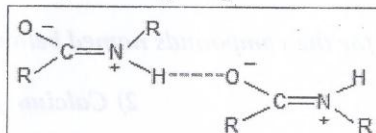
45

Q1// Choose only **FIVE** the correct answer for each of the following :- (10 Marks)

1- What is the type of bond in the following shape

A) Ionic bond

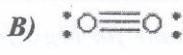
C) Hydrogen bond



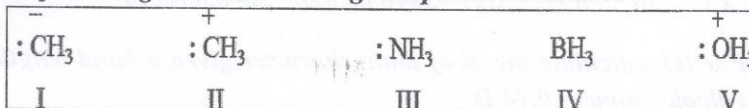
B) Covalent bond

D) Metallic bond

2- Which of the following is a correct Lewis structure for oxygen?



3- Which of the following would have a trigonal planar structure?



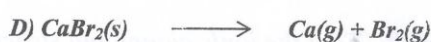
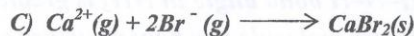
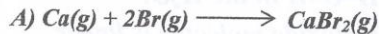
A) I, II, and IV

B) IV

C) II and IV

D) II, IV, and V

4- The lattice enthalpy of calcium bromide is the energy change for the reaction



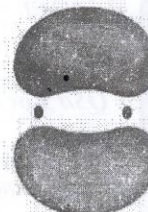
5- The figure inside is a representation of what type of orbital?

A)  $\delta p$  bonding molecular orbital

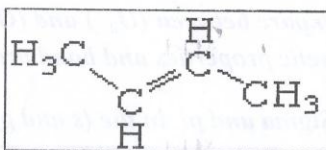
C)  $\pi p$  bonding molecular orbital

B)  $\delta p$  antibonding molecular orbital

D)  $\pi p$  antibonding molecular orbital



6- How many sigma and pi bonds are present in the following molecule?



A) 8 sigma bonds and 1 pi bond

C) 11 sigma bonds and 1 pi bonds

B) 8 sigma bonds and 2 pi bonds

D) 10 sigma bonds and 2 pi bond

Atomic number :- (H=1, B=5, C=6, N=7, O=8, F=9, P=15)  $N_0 = 6.022 \times 10^{23}$ ,  $e = 1.602 \times 10^{-19}$

turn the page







((Assessment of the final exam for the second semester))  
(Academic year 2017- 2018)

23.05.2018  
45

Q2//A// Define of the following :-

(6Marks)

- 1- Polarization                      2- Hybridization                      3- Solvolysis enthalpy

Q2// B// Write formulas for the compounds named below:

(4Marks)

- 1) Ammonium sulfate                      2) Calcium phosphide  
3) Magnesium acetate                      4) Chloric acid

Q3//A// Calculate the value of Madelung constant for MgO from the following data:-

$r_0 = 2.10 \times 10^{-10} \text{ m}$  ,  $n = 7$  ,  $U_0 = -3940 \text{ kJ mol}^{-1}$  ,  $\epsilon = 8.854 \times 10^{-12}$                       (5Marks)

Q3//B// For HI, calculate the % of ionic character given a bond length = 161 pm and an observed dipole moment 0.44 D.                      (5Marks)

Q4//A//Give reasons for the following :-

(6 Marks)

- 1- Ethyne molecule is linear.  
2- H-N-H bond angle in  $\text{NH}_3$  is greater than that of H-O-H in the  $\text{H}_2\text{O}$ ?  
3- Water molecule has bent structure where as carbon dioxide molecule is linear.

A4//B// Find the ionic compound structure of the following :-

(4 Marks)

- 1- NaCl                       $r^+ = 950 \text{ pm}$  ,  $r^- = 1810 \text{ pm}$   
2-  $\text{SrF}_2$                        $r^+ = 1130 \text{ pm}$  ,  $r^- = 1360 \text{ pm}$

Q5// For the Nitrate ion and phosphate ion , what are the following:-

(10 Marks)

- 1- Lewis structure                      2- Number of bond                      3- The formal charge  
4- Resonance                      5- Hybridization type of central atom via VBT?

Q6//A//According to M.O.T, compare between  $(\text{O}_2^-)$  and  $(\text{O}_2^+)$  ; through (diagrams, electronic Configuration, Magnetic properties and bond order.                      (6 Marks)

Q6//B// Draw how to form the Sigma and pi in the (s and p) atomic orbitals.                      (4 Marks)

\*\*\*\*Good luck\*\*\*\*

Lecturer  
Ahmed Razzaq Ibrahim



Head of Department  
Assist. Prof. Dr. Riyadh J. Nahi



((Assessment of the final exam for the second semester))  
Academic year 2017-2018

06.06.2018

45

**Q1: Answer all the following points:**

(8 marks)

- 1-What are differences between passive and active transport?
- 2-What is importance of the oxidation-reduction reactions in biological systems?
- 3-What is Gout disease and how the human body get rid of the nitrogenous wastes?
- 4- What is the differences between chemical and electrical synapses?

**Q2: Enumerate all the following points:**

(8 marks)

- 1- The Role of blood in the human Body.
- 2- The importance of genetics materials DNA.
- 3- Hormones can be chemically classified into four groups.
- 4- In the animals, the feeding process undergoes a series of steps.

**Q3: A-Give table for the following points:**

(8 marks)

- 1- Hypothalamus, associated hormones and effect.
- 2- Inputs and outputs of Kerbs cycle in cellular respiration.

**Q3: B- Give a scientific reason for the following points:**

- 1- Alzheimer's disease
- 2- Stomach ulcers

**Q4: Draw all the following figures:**

(8 marks)

- 1-Diagram how the theory is put by scientist.
- 2- Fatty acid oxidation in peroxisomes.
- 3- The urea cycle in the terrestrial animals.
- 4- Neurons cell structures.

**Q5: Define all the following terms:**

(8 marks)

- 1-Accepted Hypothesis, 2-Endoplasmic reticulum, 3-ATP, 4-Herbivores, 5- RNA
- 6- Inositol triphosphate (IP3), 7- ileum, 8- Osmoregulation.

Lecturer: Dr. Yasir Adil Alabdali

Head of Department: Asst.Prof.Dr. Reyad Jalil







((Assessment of the final exam for the second semester))  
Academic year 2018 - 2017

04.06.2018

45

**Q1//** Find the pCd for the titration of 100 mL of  $25 \times 10^{-4}$  M  $\text{Cd}^{2+}$  with 0.01 M EDTA at a pH of 10 ( $\alpha_{Y^{4-}}$  is 0.35) and in the presence of 0.0100 M  $\text{NH}_3$  ( $\alpha_{\text{Cd}^{2+}}$  is 0.0881) after addition the following volumes from EDTA:

- (a) 0 mL
- (b) 15 mL
- (c) 40 mL

The formation constant for  $\text{Cd}^{2+}$ -EDTA is  $2.9 \times 10^{16}$ . (6 Marks)

**Q2//** Answer **Two Only** of the following questions:

- A) Explain the Metal ion indicators method for the End-point detection in complexions titration and give an example.
- B) Define the Complexation Titrations Curve (5 Marks)
- C) Write short notes about the Complexation Reactions?

**Q3//** Calculate the pH during the titration of 50.00 mL of 0.0500 M KOH with 0.1000 M HCl at 25°C after the addition of the following volumes of reagent:

- (a) 10 mL
- (b) 30 mL (5 Marks)

**Q4//** Consider the titration of 25.00 mL of 0.1 M pyridine with 0.1M HCl.

$$K_b = 1.59 \times 10^{-9}$$

- (a) Locate the equivalence point.
- (b) Find the pH when addition of 25 mL of reagent. (5 Marks)

**Q5//** Write Short Notes and give an example about the following (4 Marks)

- (a) Titration Curves.
- (b) Standardization.

نظفا اقلب ورقة الاسئلة





((Assessment of the final exam for the second semester))

Academic year 2018 - 2017

04.06.2018

45

**Q6//Answer One Only** of the following questions: (5 Marks)

**A)** Consider the titration of 50.0 mL of 0.100 M acetic acid,  $\text{CH}_3\text{COOH}$  ( $K_a = 1.75 \times 10^{-5}$ ) with 0.100 M NaOH,

- (a) Choose appropriate indicator for this titration?  
(b) Find the pH after adding 20 mL of NaOH

**B)** A 250 mg sample of an organic weak acid was dissolved in an appropriate solvent and titrated with 0.0556 M NaOH, requiring 32.58 mL to reach the end point. Determine the compound's equivalent weight?

**Q7//** A 0.1036g sample containing only  $\text{BaCl}_2$  (208.3 g/mol) and NaCl (58.5 g/mol) is dissolved in 50 mL of distilled water. Titrating with 0.07916 M  $\text{AgNO}_3$  requires 19.46 mL to reach the Fajans end point. Report the %w/w  $\text{BaCl}_2$  in the sample. (5 Marks)

**Q8//** Calculate the pCl and pAg during the titration of 50 mL of 0.05 M NaCl with 0.1 M  $\text{AgNO}_3$  after the addition of the following volumes of reagent:


- (a) 20 mL  
(b) 25 mL

, ( $K_{sp}$  For  $\text{AgCl} = 1.82 \times 10^{-10}$ ) (5 Marks)

**Q9//** Answer the following questions

- A)** Explain the methods for Finding the End Point Potentiometrically in Precipitation Titration.  
**B)** What is the Effect of Concentration on the Titration Curves in precipitation titration? (5 Marks)

Good Luck

  
Lecturer  
Zaman S. Mehdi



  
Head of Department  
Assist. Prof. Dr. Riyadh J. Nahi