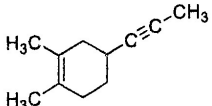
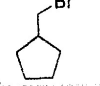
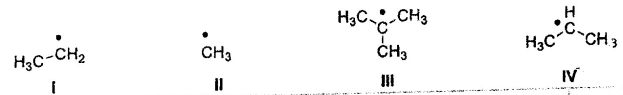
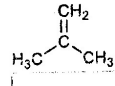
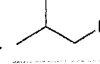
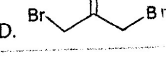
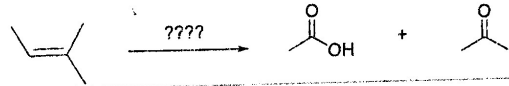


17-	For the following compound, how many $sp^3-sp^2\sigma$ bonds?				
		A. 1	B. 2	C. 3	D. 4
18-	What are the products of the following reaction?	$\text{H}_3\text{C}-\underset{\text{H}}{\text{C}}=\text{CH}_2 \xrightarrow[\text{(ii) Zn/ H}_2\text{O}]{\text{(i) O}_3} \dots\dots\dots$			
		A. $\text{CH}_3\text{COOH} + \text{CO}_2 + \text{H}_2\text{O}$	B. $\text{CH}_3\text{COOH} + \text{HCOOH}$	C. $\text{CH}_3\text{CH(OH)CH}_2\text{OH}$	D. $\text{CH}_3\text{CHO} + \text{CH}_2\text{O}$
19-	What is the major product of the following reaction?				
		A. 	B. 	C. 	D. 
20-	What is the formal charge of the nitrogen atom in nitrate anion (NO_3^-)?				
		A. 1+	B. 2-	C. 1-	D. 0
21-	Arrange the following carbon radicals in order of decreasing stability.				
		A. $\text{II} > \text{I} > \text{IV} > \text{III}$	B. $\text{I} > \text{II} > \text{IV} > \text{III}$	C. $\text{III} > \text{IV} > \text{I} > \text{II}$	D. $\text{IV} > \text{III} > \text{I} > \text{II}$
22-	How many moles of oxygen are required to complete the combustion of one mole of butene?				
		A. 4	B. 6	C. 8	D. 10
23-	What is the major product of the following reaction?				
		A. 	B. 	C. 	D. 
24-	What is the best condition for the following conversion?				
		A. $\text{KMnO}_4/\text{NaOH}/\text{Heat}$	B. Cold $\text{KMnO}_4/\text{NaOH}$	C. $\text{O}_3/\text{Zn}/\text{H}_2\text{O}$	D. $\text{O}_3/\text{Zn}/\text{H}_2\text{O}_2$

25-	What is the final product of the following reaction?			
	$\text{H}_3\text{C}-\text{C}\equiv\text{CH} \xrightarrow[\text{H}_2\text{SO}_4]{\text{HgSO}_4} \dots\dots\dots$			
	A. $\text{CH}_3\text{CH}_2\text{COOH}$	B. CH_3COCH_3	C. $\text{CH}_3\text{CH}_2\text{CHO}$	D. $\text{CH}_3-\text{CH}=\text{CH}_2$

Section B: Analytical Chemistry

Choose the correct answer; A, B, C or D in each of the following: (25 Marks)

26-	The equilibrium constant (K_{eq}) for a certain reaction will change if changes. A) pressure B) temperature C) concentration D) volume
27-	Consider the reaction: $4\text{NH}_3(g) + 5\text{O}_2(g) \rightleftharpoons 4\text{NO}(g) + 6\text{H}_2\text{O}(g)$ ($\Delta H^\circ = -75 \text{ kJ}$); which of the following condition will shift the equilibrium position to the reverse direction? A) decreasing the temperature B) decreasing NO concentration C) increasing the volume D) increasing the pressure
28-	In the following reaction: $\text{CO}(g) + \text{H}_2\text{O}(g) \rightleftharpoons \text{CO}_2(g) + \text{H}_2(g)$ In an experiment, 0.35 mol of CO and 0.40 mol of H_2O were placed in a 1.00 L reaction vessel. At equilibrium, there were 0.19 mol of CO remaining. K_{eq} at the temperature of the experiment is: A) 5.47 B) 1.0 C) 1.78 D) 0.56
29-	Consider the following: $2\text{NO}_2(g) \rightleftharpoons \text{N}_2\text{O}_4(g)$ ($K_c = 1.2$) A 1.00 L flask is filled with 1.4 mol NO_2 and 2.0 mol N_2O_4 . To reach equilibrium, the reaction proceeds to the: A) left as $Q > K_{eq}$ B) right as $Q < K_{eq}$ C) right $Q > K_{eq}$ D) left as $Q < K_{eq}$
30-	Ammonium hydrogen sulfide dissociates at room temperature according to the equation: $\text{NH}_4\text{HS}(s) \rightleftharpoons \text{NH}_3(g) + \text{H}_2\text{S}(g)$ ($K_p = 0.16$). The total pressure of the gases at equilibrium with NH_4HS at room temperature equals A) 0.2 B) 0.4 C) 0.6 D) 0.8
31-	For the reaction $\text{H}_2(g) + \text{O}_2(g) \rightleftharpoons 2\text{H}_2\text{O}(g)$; the value K_c/K_p is equal to: A) 1.0 B) $\sqrt{RT}$ C) $1/\sqrt{RT}$ D) $1/RT$
32-	If the equilibrium constant (K_c) for the reaction; $\text{H}_2(g) + \text{I}_2(g) \rightleftharpoons 2\text{HI}(g)$ is 25, the value of K_c for the reaction; $\text{HI}(g) \rightleftharpoons \frac{1}{2}\text{H}_2(g) + \frac{1}{2}\text{I}_2(g)$ is A) 2 B) 5 C) 0.2 D) 0.5
33-	Raising the temperature of an endothermic reaction A) shifts the equilibrium to the forward direction B) has no effect C) shifts the equilibrium to the backward direction D) none of these
34-	Which of the following pairs can form a buffer solution? A) HCl and NaCl B) NH_3 and NH_4Cl C) NaOH and NaCl D) HNO_3 and KNO_3
35-	The pH of 0.1 M solution of the following salts increases in the order: A) $\text{HCl} < \text{NH}_4\text{Cl} < \text{NaCl} < \text{CH}_3\text{COONa}$ B) $\text{NaCl} < \text{NH}_4\text{Cl} < \text{CH}_3\text{COONa} < \text{HCl}$ C) $\text{CH}_3\text{COONa} < \text{NH}_4\text{Cl} < \text{NaCl} < \text{HCl}$ D) $\text{HCl} < \text{NaCl} < \text{CH}_3\text{COONa} < \text{NH}_4\text{Cl}$
36-	The pH of 0.549 M CH_3COOH solution = ... (K_a of $\text{CH}_3\text{COOH} = 1.8 \times 10^{-5}$) A) 3.0 B) 2.7 C) 2.5 D) none of these
37-	The pH of 0.63 M H_2SO_4 solution = ... A) 0.10 B) 0.20 C) 0.30 D) none of these

38-	The pH of a mixture of 0.1M CH ₃ COOH and 0.01M CH ₃ COONa solution = ... (K _a of CH ₃ COOH = 1.8 × 10 ⁻⁵) A) 5.47 B) 4.74 C) 5.74 D) 3.74
39-	Ionization of acetic acid in the presence of sodium acetate. A) highly increases B) increases C) decreases D) does not change
40-	If K _b of NH ₄ OH = 1.0 × 10 ⁻⁵ ; the pH of 0.1 M NH ₄ Cl solution = ... A) 5 B) 7 C) 9 D) 11
41-	The condition that does not favour the completeness of precipitation of a given ion is: A) very small K _{sp} value B) high initial ion concentrations C) increasing the temperature D) high concentration of common ion
42-	If the concentration of the Ag ⁺ ions in a saturated aqueous solution of Ag ₃ PO ₄ is 3 × 10 ⁻⁵ mole/liter, then the K _{sp} of Ag ₃ PO ₄ will be: A) 2.7 × 10 ⁻¹⁹ B) 2.7 × 10 ⁻²¹ C) 9 × 10 ⁻¹⁹ D) 3 × 10 ⁻¹⁹
43-	K _{sp} of AgBr = 3 × 10 ⁻¹⁶ at 25°C. Its solubility in 0.1 M NaBr will be mole/liter A) 3 × 10 ⁻¹⁵ B) 6 × 10 ⁻¹⁵ C) 3 × 10 ⁻¹⁷ D) 9 × 10 ⁻¹⁵
44-	In which of the following solutions, will the solubility of Mg(OH) ₂ be the highest? A) NaCl B) CH ₃ COONa C) CH ₃ COOH D) NH ₄ OH
45-	The K _{sp} of the sparingly soluble Ca ₃ ((PO ₄) ₂ is expressed as follow: K _{sp} = ... A) [Ca ⁺²] ² [PO ₄ ⁻³] ³ B) [Ca ⁺²] ³ [PO ₄ ⁻³] ² C) [Ca ⁺²] ² [PO ₄ ⁻³] ² D) [Ca ⁺²] ³ [PO ₄ ⁻³] ² /[Ca ₃ (PO ₄)]
46-	If the K _{sp} of Ag ₂ CrO ₄ = 4 × 10 ⁻¹² , then the molar solubility of Ag ₂ CrO ₄ in water = ... A) 8 × 10 ⁻⁴ B) 2 × 10 ⁻⁴ C) 4 × 10 ⁻⁴ D) 1 × 10 ⁻⁴
47-	Which of the following species is a strong electrolyte? A) CH ₃ COOH B) NH ₄ OH C) NH ₄ Cl D) All of these
48-	Which of the following is not a colligative property of solutions? A) boiling point elevation B) vapor pressure elevation C) freezing point depression D) osmotic pressure
49-	An aqueous solution containing 1 g of substance X in 100 g of water is found to have a freezing point of - 0.102 °C (K _f = 1.86 °C/mol). The molecular weight of X is A) 182.35 B) 128.74 C) 205.43 D) 160.6
50-	A solution of 0.45 g of urea (M. wt. = 60 g/mole) in 22.5 g of water gave a boiling point equal (K _b = 0.51 °C/mole) A) 99.73 °C B) 99.83 °C C) 100 °C D) 100.17 °C

End of Exam

Best Wishes:

Prof. Ali Abdelhafez, Prof. Bahaa M. Abu-Zied, Prof. Essam M. Hussein, Dr. Soliman A. Soliman

	Assiut University- Faculty of Science Second Semester- Final Exam 2025-2026 Chemistry Department	Program: General Group Level: (1) Date: 14/5/2026 Time: 2 h	
Course Title: General Chemistry I		Code: C-100	
Instructors: Prof. Dr. Bahaa M. Abu-Zied and Dr. Soliman A. Soliman			
Important:	No. of pages 4	No. of questions 50	Total Marks: 50

يتم طمس (تسويد) الإجابة المختارة من قبل الطالب باستخدام القلم الجاف فقط

Choose the correct answer; A, B, C or D in each of the following: (1 Mark of each)

(1)	For an ideal gas, which pairs of variables are directly proportional to each other (if all other factors remain constant)? (1) P, T (2) P, V (3) V, T (4) n, V (A) 1 and 2 only (B) 3 and 4 only (C) 1 and 3 only (D) 1, 3 and 4 only
(2)	If the pressure and absolute temperature of 10 L of a gas are doubled, its volume would be: (A) 2½ L (B) 3 L (C) 5 L (D) 10 L
(3)	The compressibility factor (Z) of a real gas at high pressure is: (A) 1 (B) 1 + (Pb/RT) (C) 1 – (Pb/RT) (D) 1 + (RT/Pb)
(4)	The critical temperature of a substance is: (A) the temperature above which the substance undergoes decomposition. (B) the temperature above which the substance can exist only in gaseous state. (C) boiling of the substance (D) all are wrong
(5)	Which of the following gases will have lowest rate of diffusion (at the same temperature and pressure)? (atomic masses: nitrogen = 14, oxygen = 16) (A) N ₂ O (B) NO (C) NO ₂ (D) N ₂ O ₄
(6)	A real gas most closely approaches behavior of an ideal gas at (A) 15 atm and 298 K (B) 5 atm and 173 K (C) 0.5 atm and 600 K (D) 15 atm and 500 K
(7)	For a mixture consisting of N ₂ and O ₂ , which of the following expressions is correct? (A) P _{N₂} = X _{O₂} × P _{total} (B) P _{O₂} = X _{N₂} × P _{total} (C) P _{total} = P _{N₂} – P _{O₂} (D) P _{O₂} = X _{O₂} × P _{total}
(8)	The excluded volume per gas molecule equals: (A) 2V _m (B) 3V _m (C) 4V _m (D) 3 × (4/3) πr ³
(9)	The kinetic energy (E) per unit volume for one mole of an ideal gas equal (A) 2/3 P (B) 3/2 P (C) 2/3 RT (D) 3/2 RT
(10)	Which of the following is considered as anisotropic crystalline substance? (A) Rubber (B) sucrose (C) plastics (D) glass
(11)	Liquids with high intermolecular forces have viscosity. (A) Low (B) intermediate (C) high (D) none of these
(12)	The boiling point of water at 0.8 atm is: (A) 94 °C (B) 100 °C (C) 110 °C (D) 114 °C
(13)	Which of the following processes cannot be used for colloidal dispersions purification? (A) dialysis (B) distillation (C) electro-dialysis (D) ultrafiltration

(14)	The colloidal system obtained by dispersing a solid in a liquid is called
	(A) aerosol (B) foam (C) emulsion (D) sol
(15)	Colloidal sulphur can be prepared by the reaction of:
	(A) H ₂ S with a solution of copper sulphate (B) H ₂ S with a solution of sulfur dioxide (C) H ₂ S with a solution of zinc sulphate (D) H ₂ S with a solution of cobalt sulphate
(16)	Which of the following colloidal systems gives the strongest Tyndall effect?
	(a) gelatin in water (B) starch in water (c) sulphur sol (D) gum in water
(17)	Which of the following preparation method does not belong to the condensation methods of colloids preparation?
	(A) reduction method (B) mechanical dispersion method (C) Bredig's arc method (D) peptization method
(18)	Freundlich adsorption isotherm is applicable only at:
	(A) low pressure (B) high pressure (C) high temperature (D) extremely high pressure
(19)	Which one of the following is not applicable to physisorption?
	(A) proceeds with chemical bond formation (B) it is reversible (C) it takes place at low temperatures (D) many layers of adsorbed molecules may be formed
(20)	Adsorption of gases on solids is independent of:
	(A) surface area of the solid (B) temperature (C) pressure of the gas (D) crystallinity of the solid
(21)	The disadvantage of hydrogen electrode is that:
	(A) it has a standard potential of 0.00 V at 25 °C (B) it is difficult to prepare (C) it can act as anode or cathode (D) it operates at room temperature
(22)	The cell reaction $2\text{Ag}^+_{(\text{aq})} + \text{H}_{2(\text{g})} \rightarrow 2\text{H}^+_{(\text{aq})} + 2\text{Ag}_{(\text{s})}$ is best represented by:
	(A) $\text{Ag}_{(\text{s})} \text{Ag}^+_{(\text{aq})} \text{H}^+_{(\text{aq})} \text{H}_{2(\text{g})} (\text{Pt})$ (B) $\text{H}_{2(\text{g})} (\text{Pt}) \text{H}^+_{(\text{aq})} \text{Ag}^+_{(\text{aq})} \text{Ag}_{(\text{s})}$ (C) $\text{Ag}_{(\text{s})} \text{Ag}^+_{(\text{aq})} \text{H}_{2(\text{g})} (\text{Pt}) \text{H}^+_{(\text{aq})}$ (D) $\text{Ag}^+_{(\text{aq})} \text{Ag}_{(\text{s})} \text{H}_{2(\text{g})} (\text{Pt}) \text{H}^+_{(\text{aq})}$
(23)	The standard potential reduction potential at 25 °C for the following half reactions is given: $\text{Zn}^{2+} + 2\text{e}^- \rightarrow \text{Zn}$; $E^\circ = -0.76 \text{ V}$ $\text{Mg}^{2+} + 2\text{e}^- \rightarrow \text{Mg}$; $E^\circ = -2.37 \text{ V}$ When Zn dust is added to the solution of MgCl_2
	(A) ZnCl_2 is formed (B) Mg is precipitated (C) Zn dissolved in the solution (D) no reaction takes place
(24)	The potential of the cell made of $\text{Zn} \text{Zn}^{2+} (0.15 \text{ M})$ and $\text{Cu} \text{Cu}^{2+} (0.15 \text{ M})$ at 25 °C is:
	(A) 1.19 V (B) 1.09 V (C) 1.11 V (D) 1.29 V ($E^\circ_{\text{Cu}/\text{Cu}^{2+}} = +0.34 \text{ V}$; $E^\circ_{\text{Zn}/\text{Zn}^{2+}} = -0.76 \text{ V}$)
(25)	The emf of the cell, whose half-cell is given below, is
	$\text{Cu}^{2+}_{(\text{aq})} + 2\text{e}^- \rightarrow \text{Cu}_{(\text{s})}$, $E^\circ = 0.34 \text{ V}$ $\text{Mg}^{2+}_{(\text{aq})} + 2\text{e}^- \rightarrow \text{Mg}_{(\text{s})}$, $E^\circ = -2.37 \text{ V}$ (A) 1.36 V (B) -1.36 V (C) 2.71 V (D) -2.71 V

(26)	 deduced that "it is not possible to determine with accuracy both the position and the velocity of an electron at the same time"
	(A) Heisenberg (B) de Broglie (C) Plank (D) Pauli
(27)	 suggested the presence of elliptical orbits in atoms in addition to the spherical orbits.
	(A) Bohr (B) de Broglie (C) Sommerfeled (D) plank
(28)	The magnetic quantum number (m_l) describes the orbital's
	(a) size (B) shape (C) energy (D) orientation in the space
(29)	For the third spectral emission line in Brackett series for H-atom, $n_2 =$
	(A) 5 (B) 6 (C) 7 (D) 8
(30)	Which of the following is the correct set of quantum numbers for the outermost electron of S atom?
	(A) $n = 3, \ell = 1, m_l = +2, m_s = -1/2$ (B) $n = 3, \ell = 1, m_l = -1, m_s = +1/2$ (C) $n = 3, \ell = 1, m_l = -2, m_s = +1/2$ (D) $n = 3, \ell = 2, m_l = +1, m_s = -1/2$
(31)	 assumed that the electron orbit would be allowed only if its circumference contained an integral number of electron wavelengths.
	(A) Zeeman (B) de Broglie (C) Rutherford (D) Pauli
(32)	The molecule has a polar covalent bond.
	(A) HF (B) NaF (C) F ₂ (D) a and c
(33)	H ₂ CO molecule has resonating structure(s)
	(a) zero (B) one (C) two (D) three
(34)	In the Lewis structure of ClF ₃ , the total number of electron pair(s) around Cl = ...
	(A) 3 (B) 4 (C) 5 (D) 6
(35)	The number of nonbonding electron pair(s) on the Br atom in the BrF ₅ molecule = ...
	(A) zero (B) one (C) two (D) three
(36)	The formal charge on S atom in SO ₂ molecule = ...
	(a) 0 (B) +1 (C) -1 (D) +2
(37)	SO ₃ molecule has..... resonating structure(s)
	(A) zero (B) one (C) two (D) three
(38)	The bond in MgO molecule is
	(A) ionic (B) non-polar covalent (C) polar covalent (D) dative
(39)	From the Lewis structure of PO ₄ ³⁻ ion, the number of double bond(s) = ...
	(A) zero (B) one (C) two (D) four
(40)	According to VSEPR theory, the electron domain geometry of SF ₄ molecule is
	(A) trigonal planar (B) octahedral (C) trigonal bipyramidal (D) tetrahedral
(41)	The molecular geometry of ClF ₃ molecule is
	(A) trigonal planar (B) trigonal pyramidal (C) seesaw (D) T-shaped
(42)	The hybridization of Br atom in BrF ₅ molecule is
	(A) sp ² (B) sp ³ (C) sp ³ d (D) sp ³ d ²
(43)	The molecular shape of SO ₃ molecule is
	(A) trigonal planar (B) T-shaped (c) trigonal pyramidal (D) tetrahedral
(44)	C atom in molecule has hybrid orbitals of the type sp ² .
	(A) HC≡CH (B) H ₂ C=CH ₂ (C) HCN (D) CO ₂

(45)	According to VSEPR theory, which of the following compound has the smallest angle? (A) CO_2 (B) NO_2 (C) NO_2^- (D) H_2O
(46)	According to the molecular orbital theory, the bond order in O_2^+ ion = ... (A) 1 (B) 1.5 (C) 2 (D) 2.5
(47)	Which of the following molecule or ions has diamagnetic properties? (A) O_2^- (B) O_2^- (C) O_2^+ (D) O_2
(48)	The bond order in H_2^+ ion = ... (A) 0 (B) 0.5 (C) 1 (D) 1.5
(49)	The number of unpaired electron(s) in C_2 molecule = ... (A) zero (B) one (C) two (D) three
(50)	The highest energy electrons in the B_2 molecule occupy the orbital. (A) σ (B) σ^* (C) π (D) π^*

(Atomic numbers: H = 1, B = 5, C = 6, O = 8, F = 9, Na = 11, Mg = 12, P = 15, S = 16, Cl = 17, Br = 35)

End of Exam

Best Wishes: Prof. Dr. Bahaa M. Abu-Zied and Dr. Soliman A. Soliman

	Assiut University- Faculty of Science Second-Semester- Final Exam 2025-2026 Chemistry Department	Program: Medical R. Physics Level: (1) Date: 14/5/2026 Time: 2h	
Course Title: General Chemistry	Code: MRPCH-112		
Instructor: Dr. Fatma Kasem			
Important:	No. of pages 5	No. Of questions 5	Total Mark: 50 degree

Answer the following questions:

The first question:

(10 marks)

(I) Draw the structural formula of the following compounds:(answer only *four*)

a) cinnamaldehyde

b) Phenylacetate

c) m-nitroanisol

d) 2-bromo-4-oxopentanoic acid

e) 7-methylspiro[4,5]decane

f) Bicyclo[2.2.1]heptane

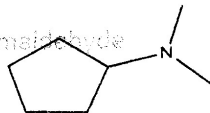
Answer the following questions:

The first question:

(10 marks)

(II) Classify the following amines as primary, secondary, or tertiary:

a) cinnamaldehyde



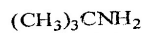
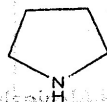
b) Phenylacetate



c) m-nitroanisol

d) 2-bromo-4-oxopentanoic acid

e) 7-methylspiro[4,5]decane



(III) Which of the following reagents are electrophiles and which are nucleophiles?

(a) Cl^-

(b) H_3O^+

(c) $AlCl_3$

(d) NH_3

(I) Classify the following amines as primary, secondary, or tertiary:

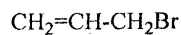
a) cinnamaldehyde



second question:

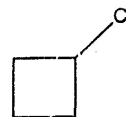
(10 marks)

(I) Write both common and IUPAC names for the following compounds: (answer only *five*)



common name:.....

IUPAC name:.....



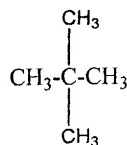
common name:.....

IUPAC name:.....



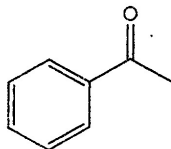
common name:.....

IUPAC name:.....



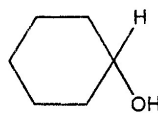
common name:.....

IUPAC name:.....



common name:.....

IUPAC name:.....



common name:.....

IUPAC name:.....

(II) Indicate the kind of hybridization you would expect for each carbon atom in the following compounds: (answer only *three*)

1. Allene $\text{CH}_2=\text{C}=\text{CH}_2$

2. Cyclobutene

3. Acetonitrile CH_3CN

4. Acetic acid $\text{CH}_3\text{CO}_2\text{H}$

(III) Draw the structural formula for the **enol form** of the following compounds:

(a) Aetaldehyde

(b) acetone

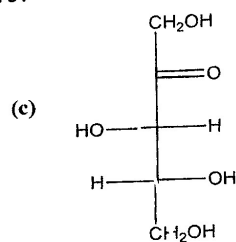
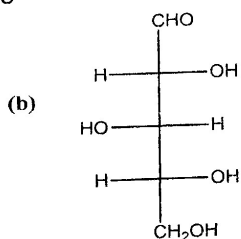
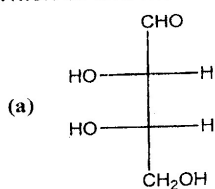
(IV) which of the following compounds is chiral: (a) 1-bromo-1-phenylethane or (b) 1-bromo-2-phenylethane

The answer is:

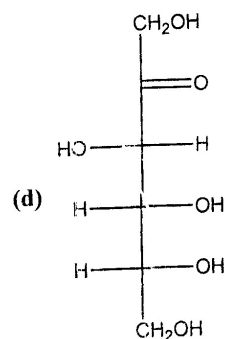
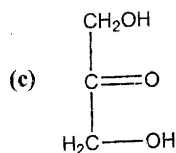
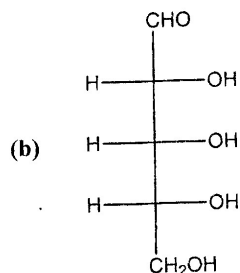
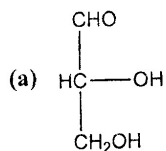
(10 marks)

The third question:

(I) which of the following are L sugars and which are D sugars?

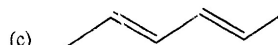
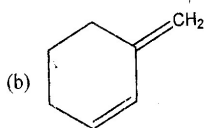
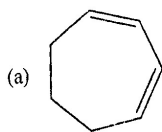


(II) Classify the following sugars by type (for example, glucose is an aldohexose): (answer only *three*)



(III) How can you explain the fact that the boiling points of alcohols are much higher than those of ethers with similar molecular weights?

(IV) Circle the conjugated parts of those molecules:



fourth question:

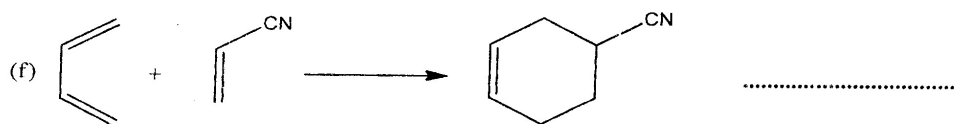
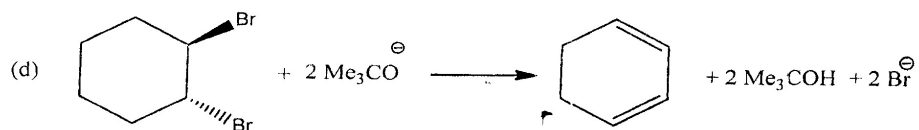
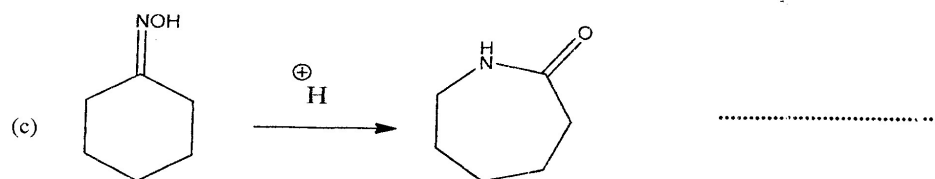
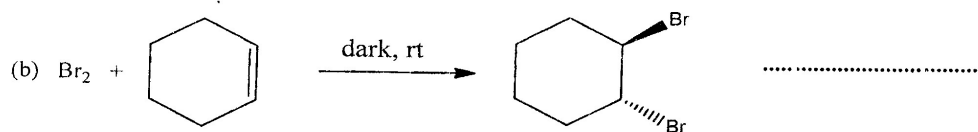
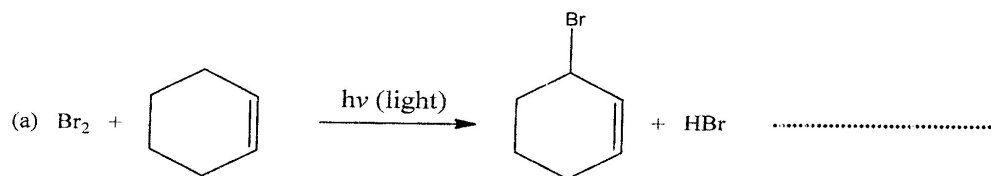
(10 marks)

(I) Draw the resonance structures for the following compounds:

1. phenol

2. pyrrole

(II) Classify the following reactions as additions, elimination, substitution, rearrangement or pericyclic reactions.



The fifth question:

(10 marks)

(I) Choose the *more stable alkene* 2-methyl-1-butene or 2-methyl-2-butene. Explain your reasoning.

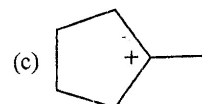
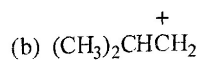
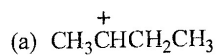
(II) Rank the following compounds in order of increasing acidity? Explain why?

a. Chloroacetic acid or dichloroacetic acid

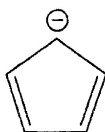
b. maleic acid or fumaric acid

(III) Which is the *more basic*, cyclohexylamine or aniline? And why the acetamide isn't basic compound?

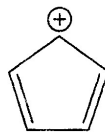
(IV) Which carbocation is the most stable? Explain your reasoning.



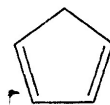
(V) Which of the following compounds is *aromatic*. Explain your reasoning.



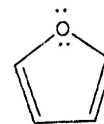
(1)



(2)



(3)



(4)



Assiut University- Faculty of Science
Frist Semester- Final Exam 2025-2026
Chemistry Department

Program: Material
Science and Technology
Level: (4)
Date: 7/6/2026
Time: 2 h



Course Title: Surface and Colloidal chemistry			Code: 205 Chem.
Instructors: Prof. Dr. Abd El-Aziz A. Said and Dr. Ahmed A. K. Mohammed			
Important:	No. of pages 2	No. Of questions 5	Total Mark: 50

Section (I)

Answer the Following Questions:

1- Choose the correct answer: (5 Marks)

- a) Which of the following statement is not true?
- The value of adsorption enthalpy of physical adsorption is less than chemical adsorption.
 - The physical adsorption occurs due to the van der Waals forces.
 - Chemical adsorption decreases at high temperature
 - Physical adsorption is reversible
- b) How magnitude of adsorption gas is expressed?
- a) $\frac{m}{x}$ b) $m \cdot \Delta x$ c) $\frac{x}{m}$ d) $x + m$
- (c) If the value of $\frac{1}{n}$ becomes zero in Freundlich adsorption isotherm the adsorption is independent to
- (a) Pressure (b) Temperature (c) quantity (d) a and b
- (d) What will be the intercept in a graph of Freundlich isotherm?
- (a) k (b) log k (c) $\frac{1}{a}$ (d) $\frac{1}{n}$
- (e) Whose value is less than zero during adsorption
- (a) ΔG (b) ΔH (c) ΔS (d) All the given

2- Define the following terms : (5 Marks)

- (i) Adsorption (ii) chemisorption (iii) monolayer adsorption (iv) surface excess concentration
(v) Specificity of adsorption

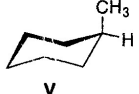
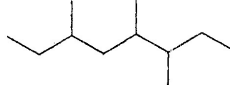
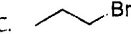
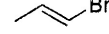
3- Answer three only from the following: (15 Marks)

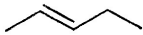
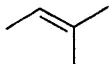
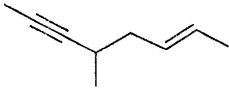
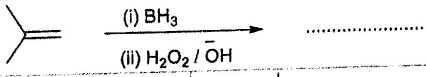
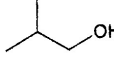
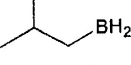
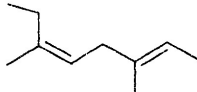
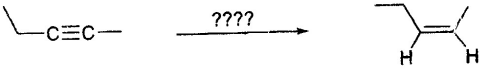
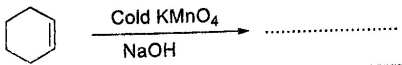
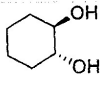
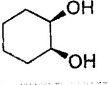
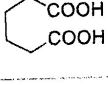
- Give account of Langmuir adsorption isotherm.
- Apply the BET equation for determining of the S_{BET} of solid catalyst from the adsorption isotherm
- How is the porosity of a solid catalyst be assessed from the adsorption isotherm.
- Explain three factors that affect the adsorption of gases on solids.

	Assiut University- Faculty of Science Second Semester- Final Exam 2025-2026 Chemistry Department	Program: General Group Level: (1) Date: 14/5/2026 Time: 2 h	 كلية العلوم جامعة أسيوط
Course Title: General Chemistry II		Code: C-105	
Instructors: Prof. Ali Abdelhafez, Prof. Bahaa M. Abu-Zied, Prof. Essam M. Hussein, and Dr. Soliman A. Soliman			
Important:	No. of pages 5	No. of questions 50	Total Marks: 50

Section A: Organic Chemistry

Select the **BEST** answer for **ALL** the following questions. (25 Marks)

1- Which of the following chemical formulas has a higher degree of unsaturation? A. C_6H_{12} B. C_4H_8 C. C_5H_8 D. C_3H_8
2- Arrange the following cycloalkanes according to increasing their relative stability.  I  II  III  IV  V A. I < II < III < V < IV B. II < I < III < V < IV C. I < II < III < IV < V D. II < I < III < V < V
3- Which of the following compounds exhibit geometric isomerism? A. 1-butene B. 2-butene C. isobutylene D. butane
4- What is the IUPAC name of the following compound?  A. 3,5,6-trimethyloctane B. 6-ethyl-3,5-dimethylheptane C. 2-ethyl-3,5-dimethylheptane D. 3,4,6-trimethyloctane
5- Which of the following compounds is allyl bromide? A.  B.  C.  D. 
6- What is the correct order for increasing electronegativity of the following hybrid orbitals? A. $sp < sp^2 < sp^3$ B. $sp^2 < sp^3 < sp$ C. $sp^3 < sp^2 < sp$ D. $sp < sp^3 < sp^2$
7- The difference between the energy required to break bonds in reactants and the energy released when forming bonds in the products is known as..... A. enthalpy change B. entropy change C. transition state D. activation energy
8- Arrange the following alkanes according to decreasing their boiling point.  I  II  III A. II > I > III B. III > II > I C. I > II > III D. II > III > I

9-	What type of isomerism is present in the following compounds?  and 			
	A. Positional isomerism	B. Chain isomerism	C. Functional group isomerism	D. Geometric isomerism
10-	What is the IUPAC name of the following compound? 			
	A. (cis)-4-methyloct-6-en-2-yne	B. (cis)-5-methyloct-2-en-6-yne	C. (trans)-4-methyloct-6-en-2-yne	D. (trans)-5-methyloct-2-en-6-yne
11-	What is the major product of the following reaction? 			
	A. 	B. 	C. 	D. 
12-	What is the correct order of decreasing stability of the following orbitals?			
	A. $s > sp > sp^2 > sp^3 > p$	B. $p > sp^3 > sp^2 > sp > s$	C. $sp^3 > sp^2 > sp > s > p$	D. $sp^3 > sp^2 > sp > p > s$
13-	What is the IUPAC name of the following compound? 			
	A. 3,6-dimethylocta-3,6-diene	B. 2-ethyl-5-methylhepta-2,5-diene	C. 3,6-dimethylocta-2,5-diene	D. 6-ethyl-3-methylhepta-2,5-diene
14-	What is the best condition for the following conversion? 			
	A. H_2/Ni	B. $Na/Liq. NH_3$	C. $Li/Liq. NH_3$	D. $H_2/Pd/C$
15-	Arrange the following hydrocarbons according to decreasing their acidity $H_2C=CH_2$ (I) H_3C-CH_3 (II) $HC\equiv CH$ (III)			
	A. $I > III > II$	B. $III > I > II$	C. $II > III > I$	D. $III > II > I$
16-	What is the product of the following reaction? 			
	A. 	B. 	C. 	D. 