Model Number (2)

53.Primary data is:

a) Data already available

b) Data collected from books and reports

c) Original data collected for a specific purpose

d) Always inexpensive

54.Which research method provides direct information about the actual behavior of individuals and groups?

a) Questionnaire

b) Telephone interview

c) Observation

d) Face-to-face interview

55.In non-comparative scaling, respondents:

a) Compare the object with a fixed standard

b) Evaluate only one object at a time

c) Always rank at least three objects

d) Compare two brands at the same time

BEST WISHES

د./أحمد حسان محمد علي

Dr. *Ahmed Hassaan Mohammed Ali*

Lecturer in The Department of Business Administration,
Faculty of Commerce, Assiut University

	Assiut University- Faculty of Science Frist Semester- Final Exam 2025-2026 Chemistry Department	Program: Industrial Chemistry Level : (2) Date: 22/1/2026 Time: 3h	
Course Title: Organic Chemistry			Code: (212 C)
Instructors: Prof. Dr. Kamal Ibrahim Aly			
Important: NA	No. of pages: 3	No. of questions: 3 parts	Total Mark: 50 degree

Answer the following questions:

Q1 : Answer the following : **(14 point)**

1) Discuss by equations the following reactions : **(4 point)**
   a) Liebermann reaction. b) Friedel-Crafts Alkylation in phenol
   c) The Vilsmeir reaction; d) Wurtz reaction Canizaro reaction
2) What you mean by : **(3 point)**
   a) Binzidine rearrangement - b) Synthesis of Amines from Nitroarenes-
   c) Nitrosation of different aromatic amines-
3) Discuss by chemical equations the synthesis of the following : **(3 point)**
   Pyrrole - Thiophene - Indole
4) Explain by equations the preparation and chemical properties of Aromatic Sulfonic Acids and their Derivatives **(2 point)**
5) Discuss by chemical equations the synthesis and reactions of Pyridine and Quinoline and Pyrimidine **(2 point)**

Q2. Choose (T) for true sentence or (F) for false sentence: **(14 point)**

1) Bromination of aniline gives p-bromoaniline(T/F)
2) Reaction of aniline with benzaldehyde to give Schif's base is called addition reaction(T/F)
3) Decarboxylation of salicylic acid gives phenol(T/F)
4) Acetyl nitrate can't be used for the nitration of pyrrole(T/F)
5) The compound to be aromatic must apply 4n+2 rule (T/F)
6) 1,3-cyclobutadiene is non aromatic compound (T/F)
7) Pyrrole is one of 1,2-diazole compounds(T/F)
8) Indole system produces from fusion of benzene with furan(T/F)
9) Isoxazole is 1,3-oxazole type where thiazole is 1,3-thiazole type(T/F)

10) Quinoline comes from fusion of pyridine with benzene ring at c3/c4(T/F)

11) The nitrogen atom of isoquinoline can be protonated and does not distrub aromaticity(T/F)

12) Oxiddiazole is a six membered ring bearing three heteroatoms (O,N and N)(T/F)

13) Pyridazine is one of 1,2-diazine type(T/F)

14) 1,3-dicarbonyl compound reacts with urea to give pyrimidine-2-thione(T/F).

Q3: Choose the correct answer a,b, or c : **(22 point)**

1) Reaction of benzene with methyl chloride in the presence of anhydrous AlCl3 to give toluene called:

i) Wurtz reaction ii) Canizaro reaction iii) Fridel-craft reaction iv) Sandmayer reaction

2) Heating phenol with zinc powder gives

i) Phenol ii) benzene iii) benzoic acid iv) cyclohexanone

3) Phenyl diazonium chloride reacts with CuCl to give

i) Benzene ii) aniline iii) benzoic acid iv) phenol

4) Benzene reacts with fuming slfuric acid to give

i) Nitrobenzene ii) phenol iii) benzene sulfonic acid iv) sulphanilic acid

5) Phenyl diazonium chloride reacts with CuCl to give

i) Aniline ii) benzene iii) chlorobenzene iv) Phenol

6) Reaction of toluene with KMnO4 produces

i) Benzoic acid ii) Benzaldehyde iii) benzene iv) Phenol

7) Fusion of benzoic acid with soda lime produces

i) Benzene ii) Benzaldehyde iii) sodium phenoxide

8) Reaction of aryl diazonium chloride with KCN to give benzonitrile called

i) Fridel-craft reaction ii) Wurtz reaction iii)Sandmeyer reaction iv) Cannizaro reaction

9) Toluene reacts with chlorine in the presence of sun light to give benzyl chloride by

i) Electrophilic addition ii) Nucleophilic addition free radical reaction iv) none of them

10)..... is the activating group and directing o-p in the monosubstituted benzene reactions:

i) Br ii) NH2 iii) NO2 iv) SO3H

11)..... is the deactivating group and directing o-p in the monosubstituted benzene reactions:

i) Br ii) OH iii) NH2 iv) CN

12) A planar, cyclic system of unsaturated carbon atoms containing $(4n+2)\pi$ electrons will be aromatic ,when (n) is a positive integer or zero it's called:

i) octat ruler ii) huckel ruler iii) Markovnikov ruler iv) none of them

Assiut University Faculty of Science Exam time: 2 hours Pages: 10 pages	 Chemistry Department Academic Year: 2025/2026	2nd Year– 1st Semester Final Exam (January 2026) Course Name: Marketing Research Dr: Ahmed Hassaan Total Marks: 50 Marks Exam date:17/1/2026

Model Number (2)

Question one :(1-12) Indicate which of the following statements is TRUE (A) or FALSE (B):

1. **Opening questions in a questionnaire should be personal or sensitive.**

a) True	b) False

2. **Double-barreled questions contain more than one idea.**

a) True	b) False

3. **Q-sort is a non-comparative scaling method.**

a) True	b) False

4. **Constant sum scaling produces nominal-level data.**

a) True	b) False

5. **Understanding who customers are, what they want, and what price they'll pay is a core research outcome.**

a) True	b) False

6. **Data analysis should align with the hypotheses and research questions.**

a) True	b) False

7. **Reports should be actionable and clearly presented.**

a) True	b) False

8. **Among itemized rating scales, the Stapel scale is generally the least used in marketing research.**

a) True	b) False

Model Number (2)

9. **A Likert scale is primarily designed to measure the degree of agreement or disagreement with statements about an object.**

a) True	b) False

10. **Continuous rating scales allow respondents freedom to place a mark at any point along a line between two extremes.**

a) True	b) False

11. **Open-ended questions are easier to analyze than closed-ended questions.**

a) True	b) False

12. **Interviews are always unstructured and informal.**

a) True	b) False

Question two: (13-55) Choose the correct answer for each question, and transfer the answers to your Answer Sheet following the Same Sequence:

13. **Which of the following is a key disadvantage of observation?**
    a) Low response rate
    b) Interviewer bias
    c) Expensive and time-consuming
    d) Cannot reach remote respondents

14. **Which method is free from interviewer bias and records responses in respondents' own words?**
    a) Face-to-face interview
    b) Telephone interview
    c) Observation
    d) Questionnaire

15. **In a simple, single-stage sample:**
    a) Sampling units never equal elements
    b) Only organizations are eligible
    c) Multi-stage design is required

d) Sampling units and population elements may be the same

16. The first step in the research process is:

a) Fieldwork

b) Report writing

c) Problem definition

d) Data coding

17. An unstructured questionnaire is best for:

a. Collecting numerical data

b. Highly standardized responses

c. Multiple-choice questions

d. Obtaining in-depth qualitative information

18. Which research method usually yields the richest and most detailed data?

a) Questionnaire

b) Telephone interview

c) Observation

d) In-depth interview

19. In judgment sampling, respondents are chosen because:

a) The researcher believes they are especially appropriate for the study

b) They appear first on the list

c) They refer others

d) They fit quotas on demographics

20. A major advantage of secondary data is that it:

a) Is always accurate

b) Is tailored to the researcher's exact needs

c) Is always up to date

d) Saves time and cost

21. One benefit of checking a sample of questionnaires is to:

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a) Detect interviewer dishonesty
b) Increase response rate
c) Reduce sample size
d) Create hypotheses

22. Secondary data is most useful in:

a) Experiments only
b) Observation
c) Hypothesis testing only
d) Exploratory studies

23. Non-comparative scaling mainly includes:

a) Continuous rating and itemized rating scales
b) Stapel and semantic differential scales only
c) Rank order and Q-sort scales
d) Likert and constant-sum scales only

24. When symptoms are mistaken for the problem, research will most likely:

a) be perfectly efficient
b) lower costs automatically
c) answer the wrong question
d) produce guaranteed success

25. Longitudinal designs differ from cross-sectional because they:

a) Use different samples at each wave
b) Are always cheaper and faster
c) Can't detect small changes
d) Keep the same sample and measure the same variables over time

26. Open-ended questions are useful because they:

a) Provide limited information
b) Allow unexpected insights
c) Produce uniform responses

d) Are easier to code

27. Which of the following is a Likert-type response set?

a) –5 –4 –3 –2 –1 0 +1 +2 +3 +4 +5

b) Very poor / excellent

c) Yes / No

d) Very poor / poor / fair / good / excellent

28. A sampling frame is:

a. The method of hypothesis testing

b. The computed sample statistic

c. The survey questionnaire

d. The list of all eligible sampling units

29. Nominal scale numbers are used for:

a) Ranking

b) Measuring equal intervals

c) Showing true zero

d) Labels or classification

30. Snowball sampling is most suitable when:

a) The population list is complete and easily accessible

b) Conducting a national probability survey

c) Ensuring strict representativeness for inference

d) Studying rare or hard-to-reach populations

31. Which is not an advantage of cluster sampling?

a) Always more statistically precise than simple random sampling

b) Lower cost

c) Operational feasibility over wide areas

d) Requires only a list of clusters, not all elements

32. Stratified sampling is most appropriate when:

a) Population is homogeneous

b) No information exists about the population

c) Population is diverse and you want precision and comparisons

d) You only need very rough, fast insights

33. Key difference between stratified sampling and cluster sampling:

a) Stratified uses probability; cluster does not

b) Stratified samples all strata; cluster samples only some clusters

c) Stratified needs a list; cluster does not

d) Cluster always uses two stages; stratified never does

34. Which statement about probability sampling is correct?

a) It relies on researcher intuition to select units

b) It cannot support margin-of-error generalization

c) Each unit has a known, non-zero chance of selection

d) It is always cheaper and faster than non-probability methods

35. The real value of marketing research is:

a) Preparing attractive reports

b) Generating immediate sales results

c) Guaranteeing successful marketing campaigns

d) Supporting better long-term decision-making and performance

36. The following question is an example of which type of scale?

"Rate the comfort of this smartphone app by placing a mark on the line:

Very Difficult to Use ---------- Very Easy to Use"

a) Nominal scale

b) Ordinal scale

c) Semantic differential scale

d) Continuous rating scale

37. A sample is:

a) The entire market

b) A list of addresses

c) A subgroup of the population selected for the study

d) The entire population

38. Descriptive research mainly answers:

a) Why X causes Y

b) Whether a manipulation altered a dependent variable

c) The mechanism inside the consumer's brain

d) Who/what/when/where/how much

39. "Isolate/identify the problem, not the symptoms" means you should:

a) measure every symptom first

b) assume symptoms equal causes

c) ignore data entirely

d) focus on underlying causes

40. A clear problem definition mainly ensures:

a) Bigger budget

b) A proper research design

c) Viral ads

d) Free media

41. Which type of scale is used in the following question?

"Rank your favorite fast-food brands: 1 = McDonald's, 2 = KFC, 3 = Subway"

a) Nominal scale

b) Ordinal scale

c) Interval scale

d) Ratio scale

42. Which of the following is an example of a nominal scale?

a) Monthly income in dollars

b) Customer satisfaction rating (1 = Unsatisfied, 2 = Neutral, 3 = Satisfied)

c) Age of customers

d) Gender: 1 = Male, 2 = Female

Model Number (2)

43. The following question is an example of which type of scale?

"Rank the following car brands from most preferred (1) to least preferred (4) based on reliability: Toyota, Honda, Ford, BMW"

a) Nominal scale

b) Ordinal scale

c) Rank order scale

d) Ratio scale

44. The following question is an example of which type of scale?

"You have 100 points. Allocate them to show the importance of each factor when buying a car: Fuel efficiency, Safety, Price, Design, Brand reputation"

a) Nominal scale

b) Ordinal scale

c) Rank order scale

d) Constant sum scale

45. A major risk of secondary data is that:

a) It's too expensive

b) Takes too long to collect

c) Requires many interviews

d) May be outdated or irrelevant

46. What is the main limitation of convenience sampling?

a) Results may not represent the whole population

b) Sampling error can be large

c) Cannot be used for exploratory research

d) Both A and B

47. In a study of smartphone brand preferences, which group represents the "population"?

a) Anyone who buys anything

b) A random list of customers

c) The largest available dataset

d) All smartphone users in the country

48. Qualitative vs. Quantitative: which pairing is correct?

a) Qualitative is large, standardized; Quantitative is small, open-ended

b) Both require identical sample sizes

c) Both forbid primary data

d) Qualitative is small, open-ended; Quantitative is large, standardized with statistics

49. A laboratory experiment typically offers:

a) Highest realism and lowest control

b) High control over extraneous variables

c) No manipulation of independent variables

d) No need for random assignment

50. Causal research aims to:

a) Describe market shares only

b) Generate hypotheses only

c) Establish whether $X \rightarrow Y$ and the nature of that relationship

d) Measure frequencies without inference

51. A clearly defined marketing research problem should:

a) be ambiguous to allow flexibility

b) align the study's scope, methods, and metrics

c) be kept secret from the team

d) avoid mentioning decisions

52. Target population elements must:

a) Be unique, countable, and collectively exhaust the target population

b) Include only customers with warranties

c) Be anonymous

d) Exclude organizations

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	Assiut University- Faculty of Science Frist Semester- Final Exam 2025-2026 Chemistry Department		Program: Nanotechnology Level : (2) Date: 22/1/2026 Time: 2 h
Course Title: Surface and Colloidal Technology			Code: Chem 205
Instructors: Prof. Dr. Abd El-Aziz A. Said and Prof. Dr. Maher M. Girgis			
Important:	No. of pages 2	No. of questions 2	Total Mark:50 degree

Section (I)

I. Chose the following correct answer of the following (5 Marks)

1- Freundlich adsorption isotherm is given the expression $x/m = kP^{1/n}$, which of the following conclusions can be drawn from this expression.
   a) When n = 0, the adsorption is independent of pressure.
   b) When n = 0, the adsorption directly proportional to pressure.
   c) When n = 0, x/m vs P graph is a line parallel to x-axis.
   d) When n = 0, plot of x/m vs pressure is a curve.

2- Which is Favorable for physical adsorption?
   a) High T and high P c) Low T and high P
   b) High T and low P d) T and P don't affect

3- The term "sorption" stands for .....
   a) Absorption b) adsorption c) desorption d) both adsorption and desorption

4- Extent of adsorption of adsorbate from solution phase increases with .....
   a) Increase in amount of adsorbate in solution
   b) Decrease in surface area of adsorbent
   c) Increase of temperature of solution
   d) Decrease in amount of adsorbate in solution

5- In Langmuir's model of adsorption of a gas on solid surface
   a) The rate of dissociation of adsorbed molecules from the surface does not depend on the surface covered.
   b) The adsorption at a single site on the surface may involve multiple molecules at the same time
   c) The mass of gas striking a given area of surface is proportional to the pressure of gas
   d) The mass of gas striking a given area of surface is independent of the pressure of the gas

II. Short answer questions (10 Marks)
   a) Why is the process of physisorption reversible whereas chemisorption is not
   b) What is Freundlich adsorption isotherm.
   c) Why is it important to have clean surface in surface studies
   d) Why do physisorption and chemisorption behave differently with rise in temperature
   e) Why is desorption important for a substance to act as good

III. Answer two only from the following questions (10 marks)
   a) Apply t-method for calculating of S_t and Porosity of a solid catalyst from adsorption isotherm.

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	Assiut University, Faculty of Science **First Semester, Final Exam 2025–2026** **Chemistry Department**	Program: Chemistry Level: (2) Date: 9/1/2026 Time: 2 h	
Course Title: Introductory Quantitative Analysis		Code: 240–C	
Instructors: Prof. Dr. Hassan Sedaira and Prof. Dr. Elham Y. Hashem			
No. of Pages 2	No. of questions 4 from 5	Total Mark: 50 degree	

Answer Four Questions Only: **(50 Mark)**

I. a) Write briefly on:

i) Liebig method.

ii) Limitations of Mohr method.

b) Calculate the ppm concentration of a 2.5×10^{-4} M solution of $CaCl_2$.

c) Express the titer of a 0.05 M $KMnO_4$ solution in mg Fe_2O_3/mL.

d) A 425.2 mg sample of a purified monoprotic organic acid (HA) is titrated with 0.1027 M NaOH, requiring 28.78 mL, what is the molecular weight of the acid?

II. a) Define:

i) Chelating agent.

ii) Metal ion sensitive indicator.

b) Calculate the molarity of a commercial perchloric acid ($HClO_4$) that is 70% (wt/wt) and specific gravity 1.668 (g/mL).

c) Given that the solubility product of AgCl is 1.2×10^{-10}, calculate the molar solubility.

d) Chloride in a brine solution is determined by Volhard method. A 10 mL aliquot of the solution is treated with 15 mL of standard 0.12 M $AgNO_3$ solution. The excess silver is titrated with standard 0.12 M KSCN solution, requiring 2.30 mL to reach the red $Fe(SCN)^{2+}$ end point. Calculate the concentration of chloride in the brine solution, in g/L.

III. a) Define:

i) Titer.

ii) Redox indicators.

b) 10.0 ml of 0.1 M Ce^{4+} solution is added to 10.0 ml of 0.2 M Fe^{2+} solution, calculate the potential of a platinum wire dipping in the solution, relative to N.H.E.

(E° Fe^{3+} , Fe^{2+} = 0.77 V & E° Ce^{4+} , Ce^{3+} = 1.61 V)

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13) Nomenclature of heterocyclic compounds having five membered ring suffixes is:

i) -ine ii) -ole iii) -epine iv) -olidin

14) α-Aminoketone react with carbonyl compound which have an α-methylene group to give

i) thiophene ii) furan iii) pyrrole iv) Pyridine

15) Synthesis of pyrrole works only if the methylene group of the second component is activated to enable the desired condensation is called

i) Paal-Knorr synthesis ii) Knorr synthesis iii) Fleischer synthesis iv) none of them

16) 1,4-Dicarbonyl compounds can be reacted with P2S5 to give:

i) Pyridine ii) Indole iii) Thiophene iv) thiazole

17) The electrophilic substitution reactions of indole occurs mainly at :

i) C2 ii)NH iii) C3 iv) aromatic ring

18) The number of heterocyclic compounds generally start at :

i) Heteroatom ii) carbon atom iii) A and B iv) fused face

19) Which of the following would be expected an aromatic compound:

i) Pyridine ii) 1,3,5-hextriene iii) Cyclohexene iv) indole

20) Direct acetylation of thiophene with acetyl chloride gives:

i) 2-acetylthiophene ii) 3-acetylthiophene iii) A and B iv) None of them

21) Formylation reaction of reactive heterocyclic compounds by using DMF/POCl3 in acidic media, it's called :

i) Chichibabin ii) Vilsmeir iii) Knorr iv) Paal-Knorr

22) An example of 1,2-diazole is :

i) Pyrazole ii) thiazole iii) imidazole iv) pyrimidine

Good Luck

Examiner:

Prof. Dr. Kamal Ibrahim Aly

	Assiut University, Faculty of Science **First Semester, Final Exam 2025–2026** **Chemistry Department**	Program: Chemistry Level: (2) Date: 9/1/2026 Time: 2 h	
Course Title: Introductory Quantitative Analysis		Code: 240–C	
Instructors: Prof. Dr. Hassan Sedaira and Prof. Dr. Elham Y. Hashem			
No. of Pages 2	No. of questions 4 from 5	Total Mark: 50 degree	

Answer <u>Four</u> Questions Only: **(50 Mark)**

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	Assiut University- Faculty of Science Frist Semester- Final Exam 2025-2026 Chemistry Department	Program: Nanotechnology Level : (2) Date: 22/1/2026 Time: 2 h	
Course Title: Surface and Colloidal Technology			Code: Chem 205
Instructors: Prof. Dr. Abd El-Aziz A. Said and Prof. Dr. Maher M. Girgis			
Important:	No. of pages 2	No. of questions 2	Total Mark:50 degree

Section (I)

I. Chose the following correct answer of the following (5 Marks)

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2- Which is Favorable for physical adsorption?
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3- The term "sorption" stands for .....
   a) Absorption b) adsorption c) desorption d) both adsorption and desorption

4- Extent of adsorption of adsorbate from solution phase increases with .....
   a) Increase in amount of adsorbate in solution
   b) Decrease in surface area of adsorbent
   c) Increase of temperature of solution
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5- In Langmuir's model of adsorption of a gas on solid surface
   a) The rate of dissociation of adsorbed molecules from the surface does not depend on the surface covered.
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II. Short answer questions (10 Marks)
   a) Why is the process of physisorption reversible whereas chemisorption is not
   b) What is Freundlich adsorption isotherm.
   c) Why is it important to have clean surface in surface studies
   d) Why do physisorption and chemisorption behave differently with rise in temperature
   e) Why is desorption important for a substance to act as good

III. Answer two only from the following questions (10 marks)
   a) Apply t-method for calculating of S_t and Porosity of a solid catalyst from adsorption isotherm.

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b) Apply the BET method for calculation S_{BET} of a solid catalyst from adsorption isotherm.

c) What are the differences between physisorption and chemisorption

Section (II)

1- Explain what is meant by the following terms (Give an example for each one): (6 Marks)

a) Emulsifying agents. b) Non-elastic gel.

c) Protective colloids. d) Salting out of lyophilic colloids.

2- Describe a method for the preparation of the following: (6 Marks)

a) Gold sol by the reduction method. b) Water in oleic acid emulsion.

c) Solid alcohol d) Silicic acid gel.

3- A) Give the structure of the colloidal ion of SiO_2 sol in water. (1 Mark)

B) Give reasons for the following:- (4 Marks)

a) The amount of electrolyte required to precipitate a given sol depends on the nature of the electrolyte added. Give an example.

b) The breaking of oil in water emulsion stabilized by sodium soap through addition of sulphuric acid.

4) Complete the following:- (4Marks)

a) ..... is a common thixotropic gel , and the dispersed phase in emulsions are generally ..... charged.

b) ..... is an example of multimolecular colloids, whereas .....soaps generally favor the formation of water in oil emulsions.

c) The "salting out" power of sufficiently high concentration of various ions is given by the ..... series, in which the ions are arranged in order of .....

d) ..... is an example of man-made emulsions, whereas detergents are man-made ..... .

5) Mark (√) for the correct sentence and (x) for the wrong one [correct the wrong sentence]: (4 Marks)

a) Hydrous ferric oxide sol moves to the cathode.

b) The process of fast removing of ions (or molecules) from a sol by diffusion through a permeable membrane is called electroosmosis.

c) The dispersal of a precipitated material into colloidal solution by the action of an electrolyte in solution is called electrodialysis.

d) If the sol particles in a given colloid move towards the cathode, the dispersion medium carries negative charge.

---------- Good Luck ----------

Prof. Prof. Dr. Abd El-Aziz A. Said and Prof. Dr. Maher M. Girgis.

	Assiut University- Faculty of Science Frist Semester- Final Exam 2025-2026 Chemistry Department	Program: Chemistry Level : (2) Date: 4/1/2026 Time: 3 h	كلية العلوم جامعة أسيوط
Course Title: Reaction Mechanism and Carbonyl compounds		Code: 210 Chem.	
Instructors: Prof. Dr. Adel Mohamed Kamal El-Dean			
Important:	No. of pages 3 / No. Of questions 7	Total Mark:50 degree	

Answer the following questions: ... (50 marks).

Part 1(Reaction Mechanism) (25 marks).

I- Mark (√) or (X) for the following sentences and then correct the wrong one: (5 Marks)

1. Crowding at the carbon that bears the leaving group slows the rate of bimolecular nucleophilic substitution
2. Allylic and benzylic intermediates stabilized by delocalization of charge.
3. Nucleofuge is a leaving group which departs with its bonding pair of electrons following homolysis.
4. Carbanion stabilized by alkyl substituents by positive inductive effect and negative hyperconjugation.
5. Chemical trapping and isolation are methods used to determine the rate of reaction.

II- Choose the correct answer for the following questions (five only): ..... (5 marks)

1.From the following groups or atoms has a positive inductive effect?
a. Br , b. NO_2 , c. $HC(CH_3)_2$

2. Which of the following reaction would for synthesis of t-butyl ethyl ether :
a. $(CH_3)_3CO^- + CH_3CH_2Br$, b. $(CH_3)_3CBr + CH_3CH_2O^-$, c. $(CH_3)_3C\,O^- + CH_3CH_2O^-$

3. Reaction of $BrCH_2CH_2CH_2Cl$ with NaCN give :
a. $NCCH_2CH_2CH_2Cl$, b. $BrCH_2CH_2CH_2CN$, c. $NCCH_2CH_2CH_2CN$

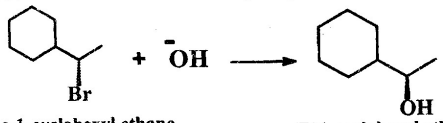
4. Which of the following reagents will react with 2-bromopropane to give a substitution product.
a. CH_3COOH , b. NaCN , c. H_2O , d. C_2H_5OH

5. Based on Saytzeffs rule, select the most stable alkene :
a. 1-methylcyclohexene , b. 3-methylcyclohexene , c.4-methylcyclohexene, d. They are all of equall stability

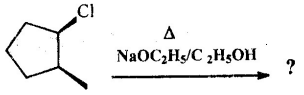
6. $CH_3CONH_2 + P_2O_5 \rightarrow CH_3C{\equiv}N$
The change in hybridization of carbon in the above reaction is:
a. sp^3 to sp^2 , b. sp^2 to sp^3 , c. sp to sp^3 , d. sp^2 to sp

III- For FOUR ONLY of the following reactions, suggest a reaction mechanism,(show your answer by equations) and explain how can you confirm your mechanism experimentally? Also, give the type of the reaction: (10 Marks)

a- $(CH_3)_2CHOH + HCl \rightarrow (CH_3)_2CHCl$

b. 

(S)1-bromo-1-cyclohexyl ethane (R)1-cyclohexyl ethanol



c. cis-1-chloro-2-methylcyclopentane

d- $PhCH_2Br + HO^- \rightarrow PhCH_2OH$

e- 4-bromo-2-pentanone + $\bar{O}H$ ⟶ 3-penten-2-one

IV- 1. Give reason: (5 Marks)
a. Why E2 mechanism stereospecific while E1 mechanism is non-stereospecific.
b. The compound $CH_2{=}CH{-}Br$ doen't undergoes S_N1 or S_N2
c. Solvation stabilize ions.
d. The iodide ion is an excellent leaving group.
2. The difference in energy between the energy of reactants and transition state called .....

CO

Part B. Carbonyl Compounds (25 Marks)

V- (5 Marks)

(a) Carboxylic acids do not give characteristic reactions of carbonyl group. Explain why?

(b) Draw the structures formula Two Only of the following:

(i) 2-Ethyl-3-hydroxyl-4-hexenal. (ii) 5-Hexynoic acid. (iii) 2,6-Dimethyl-2,5-heptdiene-4-one.

(c) What products, would you expect from the reaction of PhMgBr with Tow Only from the following:

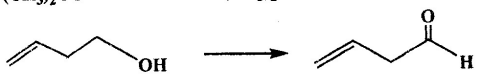
(i) $HCOOC_2H_5$ (ii)CH_3CN (iii) CO_2

VI- (10 Marks)

(a) What type of aldehydes undergo Cannizaro reaction, Aldol condensation, Claisen reaction? Giving suitable example for each.

(b) Name the reagents used in the following reactions: (Four Only)

(i) $(CH_3)_2CO \longrightarrow (CH_3)_2CHOH$

(ii) 

(iii) $PhCHO + PhCOCH_3 \longrightarrow PhCH{=}CHCOPh$

(iv) $CH_3COOC_2H_5 \longrightarrow (CH_3)_3COH$

(v) 

(c) Starting with ethyl acetoacetate, diethyl malonate or acetic anhydride, show by equations, how to synthesis (Three Only):

(i) Acetyl cyclohexane. (ii) Cyclopentane carboxylic acid.

(iii) 2-Methyl butanoic acid. (iv) 3-Phenyl-2-butanone.

VII- (10 Marks)

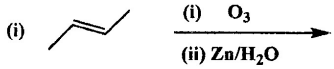
(a) Explain by equation (Two Only) from the following reaction and then discuss the mechanism, name the products and reaction,

(i) $2CH_3COOC_2H_5 \xrightarrow{NaOC_2H_5}$

(ii) $PhCHO + CH_2(COOC_2H_5)_2 \xrightarrow{R_2NH}$

(iii) $CH_3CH_2COCH_3 + \text{Exess } C_2H_5OH \xrightarrow{H^+}$

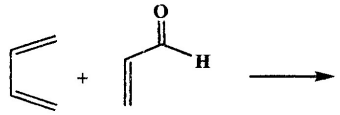
(b) Complete (Six Only) from the following equations:

(i) 

(ii) $PhCH{=}CHC_2H_5 \xrightarrow[\Delta]{\text{Conc. } KMnO_4}$

(iii) $CH_3C{\equiv}CH \xrightarrow[H_2O]{Hg^{+2} \,/\, H^+}$

(iv) $CH_3CHO + HCHO \xrightarrow{NaOH}$

(v) 

(vi) 

(vii) $CH_2(CN)_2 \xrightarrow{H^+/H_2O} \xrightarrow{C_2H_5OH/H^+}$

End of Exam

Best Wishes Prof. Dr. Adel Mohamed Kamal El-Dean
Prof. Dr. Zeinab Abdel Hamide Hozien
Prof. Dr. Omima Saad Mohamed
Prof. Dr. Ahmed Abdo Ebide

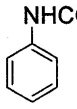
C7

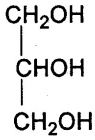
Assiut University		Time: 2 hrs
Faculty of Science Chemistry Department		Date: 21-1-2026
Final Examination of Organic Chemistry for non-Chemistry Students (C-211)		

Answer the following questions: **(50 marks)**

1- Complete each of the following equations: **(10*2=20 marks)**

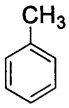
1) $CH_2=CBr-CH_2Br \xrightarrow[\triangle]{Zn\ dust}$?

2)  $\xrightarrow[CH_3COOH]{HNO_3}$?

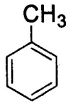
3)  $\longrightarrow$? $\xrightarrow{-CO_2}$?

4)  $\xrightarrow{O_2,\ V_2O_5}$?

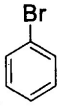
5) $CH_3CHO + HNO_3 \longrightarrow$?

6)  $\xrightarrow[AlCl_3]{CO,\ HCl}$?

7) $CH_3COCH_3 + HCOOC_2H_5 \xrightarrow{EtONa}$?

8)  $\xrightarrow[\triangle]{KMnO_4}$?

9) $Br(CH_2)_2Br \xrightarrow{2KCN}$? $\xrightarrow{H_2O/H^+}$?

10)  $\xrightarrow[CH_3Br]{2Na}$?

2-Write the structural formula of the following compounds: (only three) **(1.5*3 =5 marks)**

1) Trinitrobenzene
2) m-Nitrobenzoic acid
3) p-Toulidine
4) o-Benzoquinone

3- How to prepare the following compounds: (only five questions) **(5*5=25 marks)**

1) TNT
2) Benzoic acid from benzene
3) Picric acid
4) Nitrochlorobenzene from benzene
5) 1,3-butadiene from pyrrole
6) Benzyl chloride from toulene

Good luck

Examiner: Dr/ Maha mohamed samy

	Assiut University- Faculty of Science Frist Semester- Final Exam 2025-2026 Chemistry Department	Program: Industrial program Level : (2) Date: 21/1/2026 Time: 2 h	
Course Title: Inorganic Chemistry		Code: 207C	
Instructors: Prof. Dr. Aref A.M Aly			
Important:	No. of pages 2 / No. Of questions 5	Total Mark:50 degree	

Answer the following

1.Answer **Seven only** from the following **(14 Marks)**

Give reasons for the following

i)Barium carbonate is mixed with carbon to produce BaO.

ii)Gallium has the same radius as aluminium.

iii) SF_6 resistant to chemical attack.

iv) Cr is resistant to corrosion.

v) $K_2Cr_2O_7$ is used as a primary standard in volumetric analysis but not $Na_2Cr_2O_7$.

vi) Lanthanide and actinide contractions.

vii) $La(OH)_3$ is more basic than $Lu(OH)_3$.

viii) Anhydrous $ZnCl_2$ could not be obtained by evaporation of the aqueous solutions of the hydrated chloride.

2. Mark the correct sentence with(√) and the wrong one with (X) **(10 Marks)**

a) ZnS can easily be precipitated when H_2S is passed in an acidic solution of Zn(II) while CdS does not.

b) Iron shows in many of its compounds the maximum group valency.

c) Cu^{2+} gives a mixture of I_2 and a CuI precipitate upon reaction with KI.

d) The first ionization potential of copper is lower than that of the alkali metals.

e) Mercurous oxide and sulphide do not exist.

f)Xenon trioxide is formed upon hydrolysis of XeF_6.

g)Dehydration of metal chlorides can be best done by using thionyl chloride.

h)XeF_6 is extremely reactive even with quartz (SiO_2).

i)In the absence of complexing agents Co^{3+} is reduced by water in aqueous solutions.

j)NiS is oxidized after its precipitation to Ni(OH)S.

3. Give the nomenclature of the following compounds: **(8 Mark)**

$[Co(NH_3)_4Cl_2]^+$, $[Ag(CN)_2]^-$, $[Cr(NH_3)_3Cl_3]$, $[Ni(CN)_4]^{2-}$

4. Draw the structure of the following (**12Marks**)

B_2H_6 - phosphoric acid - metaphosphoric acid - pyrophosphoric acid

Hydrogen peroxide - sulphuric acid.

5. Give the preparation of the following **(6 Marks)**

i) One method for the industrial preparation of hydrogen
ii) The direct reactions and reductive carbonylation of metal carbonyls.
iii) Phosphorus from calcium phosphate.

End of Exam

Best Wishes **Prof. Dr. Aref A.M Aly**

c) **Define the following:**

i) Student's t–test.

ii) Buffer solution.

d) Write briefly on "Lewis acid–base theory with example".

IV. a) Distinguish between accuracy and precision.

b) What do we mean by ionic strength, and find the ionic strength of 0.01 M Na_2SO_4.

c) How can you detect the systematic error of an analytical result?

d) Find the pH of a buffer solution prepared by dissolving 12.43 g of tris (M.wt = 121.135) plus 4.67 g of tris–hydrochloride (M.wt = 157.596) in 1.0 L of water (pKa = 8.61)

V. a) Write briefly on "acid–base indicators"

b) An acetic acid–sodium acetate buffer of pH 5.0 is 0.1 M in sodium acetate. Calculate the pH after addition of 10 mL of 0.1 M NaOH to 100 ml of buffer. ($pK_a = 4.76$)

c) Calculate the pH of water containing 0.15 M KCl at 25°C.

($\gamma_{H+} = 0.83$, $\gamma_{OH-} = 0.76$)

d) An amine, RNH_2 , has a pK_b of 4.2 , what is the pH of a 0.2 M solution of the base?

(At.wt's: H = 1.008, O = 15.999 , Cl = 35.45 , Ca = 40.08 , Fe = 55.85).

انتهت الأسئلة

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Good Luck

Examiners: **Prof. Dr. Hassan Sedaira**

Prof. Dr. Elham Y. Hashem

(B) Chemical Kinetics: (17 Marks)

1- Choose the correct answer from the following answers: (5 Mark)

1	The order of reaction can be determined _____. A) theoretically B) experimentally C) (A and B) D) none of these
2	Certain bimolecular reactions which follow the first order kinetics are called -------. (A) first order reactions (B) unimolecular reactions (C) bimolecular reactions (D) pseudo unimolecular reactions
3	In the elementary reaction A+A + B⟶ products, the rate is _____. A) Rate = k [A][B] B) Rate = k$[A]^2$ [B] C) Rate = k$[A]^2$ D) None of these.
4	If the rate is second order with respect to a particular component, doubling its concentration increases the rate by a factor of _____, tripling its concentration increases the rate by a factor of _____. A) $3^2,2^3$ B) $2^2,3^2$ C) $2^2,2^3$ D) $3^2,3^3$
5	The addition of a catalyst to a reaction provides an alternate mechanism with_____ A) Lower activation energy and lower reaction rate. B) Lower activation energy and higher reaction rate. C) Higher activation energy and lower reaction rate. D) Higher activation energy and higher reaction rate.

1-For the following two reactions: (4 Marks)

a) $CH_3CHO(g) \longrightarrow CH_4(g) + CO(g)$: Rate = k $[CH_3CHO]$

b) $2NO_2(g) + F_2(g) \longrightarrow 2NO_2F(g)$: Rate = k $[NO_2]$ $[F_2]$

i) What are the overall reaction orders for the rate laws described in Equations (a) and (b)? (2 Marks)

ii) Show how we can derive the units of the rate constant for the rate law for Equations (a) and (b). (2 Marks)

3- Differentiate between the following kinetic terms:

i) Average rate, ii) instantaneous rate, and iii) initial rate. (3 Marks)

4- The decomposition of N_2O_5 proceeds according to the equation:

$$2N_2O_5(g) \longrightarrow 4NO_2 + O_2(g)$$

If the rate of decomposition of N_2O_5 at a particular instant is 4.2x10-7 M/s, what is the rate of appearance of (a) NO_2, (b) O_2? (2 Marks)

5- Rate constants for the first-order decomposition of acetonedicarboxylic acid

$$CO(CH_2COOH)_2(aq) \rightarrow CO(CH_3)_2(aq) + 2\,CO_2(g)$$

Acetone dicarboxylic acid acetone

are $k = 4.75 \times 10^{-4}\ s^{-1}$ at 293 K and $k = 1.63 \times 10^{-3}$ at 303 K.

What is the activation energy, E_a, for this reaction? (3 Marks)

(C) Catalysis: (16 Marks)

Answer the following questions:

(1) Define only three from the following: (3 Marks)

i- Catalysis ii- Space-time yield iii- Catalyst Selectivity iv- Foaling

(2) Explain the theories of catalysis according to physical and chemical approaches in catalyzing reactions. (3 Marks)

(3) i- Write short notes on some heterogeneous catalysts of industrial importance. (3 Marks)

ii- Discus the advantages and disadvantages of both homogeneous catalysts and heterogeneous catalysts. (3 Marks)

(4) Drive the kinetic equation in case the catalyst reacts only with one of the reactants as the following equation. (4 Marks)

$$A + B \longrightarrow AB^{*} \longrightarrow \text{Product}$$

Good Luck

	Assiut University- Faculty of Science First Semester- Final Exam 2025-2026 Chemistry Department	Program: Industrial Chemistry Level: 2 Date: Jan 14, 2026. Time: 3 h	
Course Title: Spectroscopy and Stereochemistry		Code: 311C	
Instructors: Prof. Dr. Ahmed Abdou O. Abeed			
Important:	No. of Pages 4 / No. of Questions 4	Total Mark: 50 degrees	

Part A. Spectroscopy

Answer the following questions (33 Marks)

Q1. (a) Describe briefly only Four of the followings: (Giving an example). (8 Marks)

(i) McLafferty rearrangement

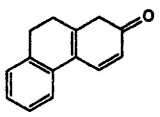
(ii) The most common method of ionization in mass spectrometry.

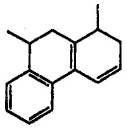
(iii) Cleavage of cyclohexene.

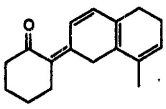
(iv) Cleavage of aliphatic carbon skeletons at branch points.

(b) Explain the appearance of the peaks at 92, 91, 77, 65, 51, 39 m/z for toluene: (3 Marks)

Q2. (a) Using the provided tables for rules of diene and enone absorption, calculate the λ_{max} of the following compounds: (6 Marks)

(i) 

(ii) 

(iii) 

(iv) 

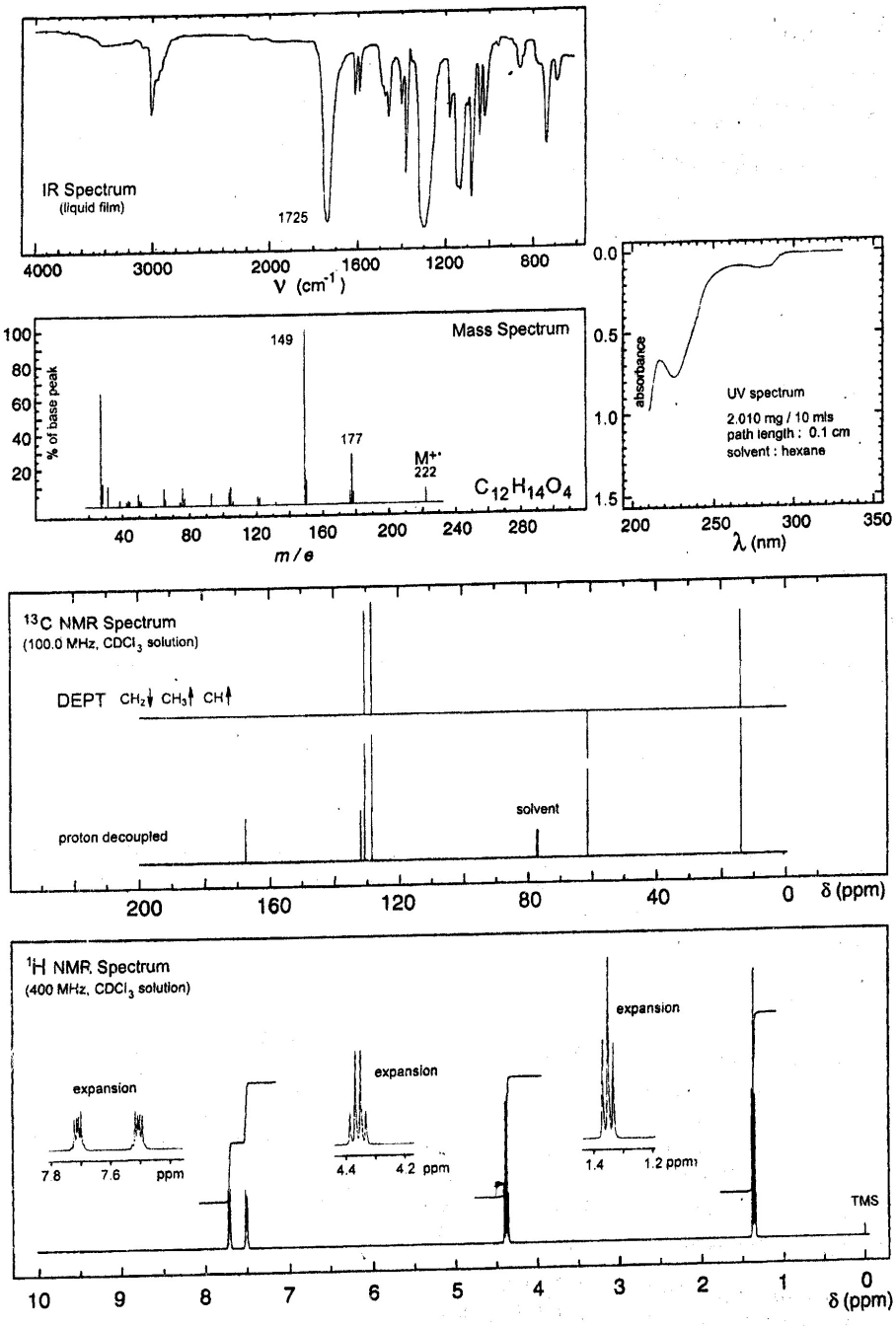
b) Using ^{1}H-NMR and ^{13}C-NMR (Resonance OFF) spectroscopy, show how can you differentiate between the following compounds: (ONLY number of signals and multiplicity) (6 Marks)

(i) Chloroacetone.
(ii) Chloroacetyl chloride
(iii) Methyl cyclopentane.
(iv) Cyclopentane.
(v) Ethyl acetate
(vi) Methyl propionate

Q3. (a) Choose (T) for the true sentences or (F) for the false ones (2 Marks)

1- IR spectroscopy can distinguish between the two isomers CH_2=$CHCH_2NH_2$ and CH_3CH_2CH=NH.
2- IR spectroscopy identifies different molecules by breaking apart the molecule into individual atoms.
3- The splitting term in ^{1}H-NMR means the number of different types of protons.
4- The ^{1}H-NMR technique is considered a kind of quantitative analyses.

(b) You are provided with IR, Mass and ^{1}H-NMR spectra of an organic compound having the molecular formula C_8H_{18}. Assign the suitable structure which agrees with the provided spectra, give reasons for your assignment and show the MS fragmentation pattern with your answer (8 Marks)


IR Spectrum
(liquid film)
1725
4000
3000
2000
1600
1200
800
ν (cm-1)
Mass Spectrum
149
177
M+·
222
C12H14O4
% of base peak
40
80
120
160
200
240
280
m/e
UV spectrum
2.010 mg / 10 mls
path length : 0.1 cm
solvent : hexane
absorbance
200
250
300
350
λ (nm)
13C NMR Spectrum
(100.0 MHz, CDCl3 solution)
DEPT CH2 CH3 CH
proton decoupled
solvent
200
160
120
80
40
0
δ (ppm)
1H NMR Spectrum
(400 MHz, CDCl3 solution)
expansion
7.8
7.6
ppm
expansion
4.4
4.2 ppm
expansion
1.4
1.2 ppm
TMS
10
9
8
7
6
5
4
3
2
1
0
δ (ppm)

Part B. Stereochemistry

Answer the following questions

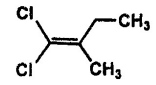
Q4. Write briefly on (with an example): (6 Marks)

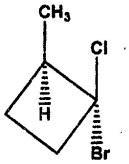
(i) Tautomerism. (ii) Chain isomers.
(iii) Geometrical isomerism. (iv) Conformational isomerism.
(v) Enantiomers. (vi) Polarimeter.

Q5. (a) Draw all possible structural formulas for the molecular formulas: (4 Marks)

(i) $C_4H_{10}O$. (ii) C_4H_9Cl.

(b) Give a complete name of the following compounds: (2 Marks)

(i) 

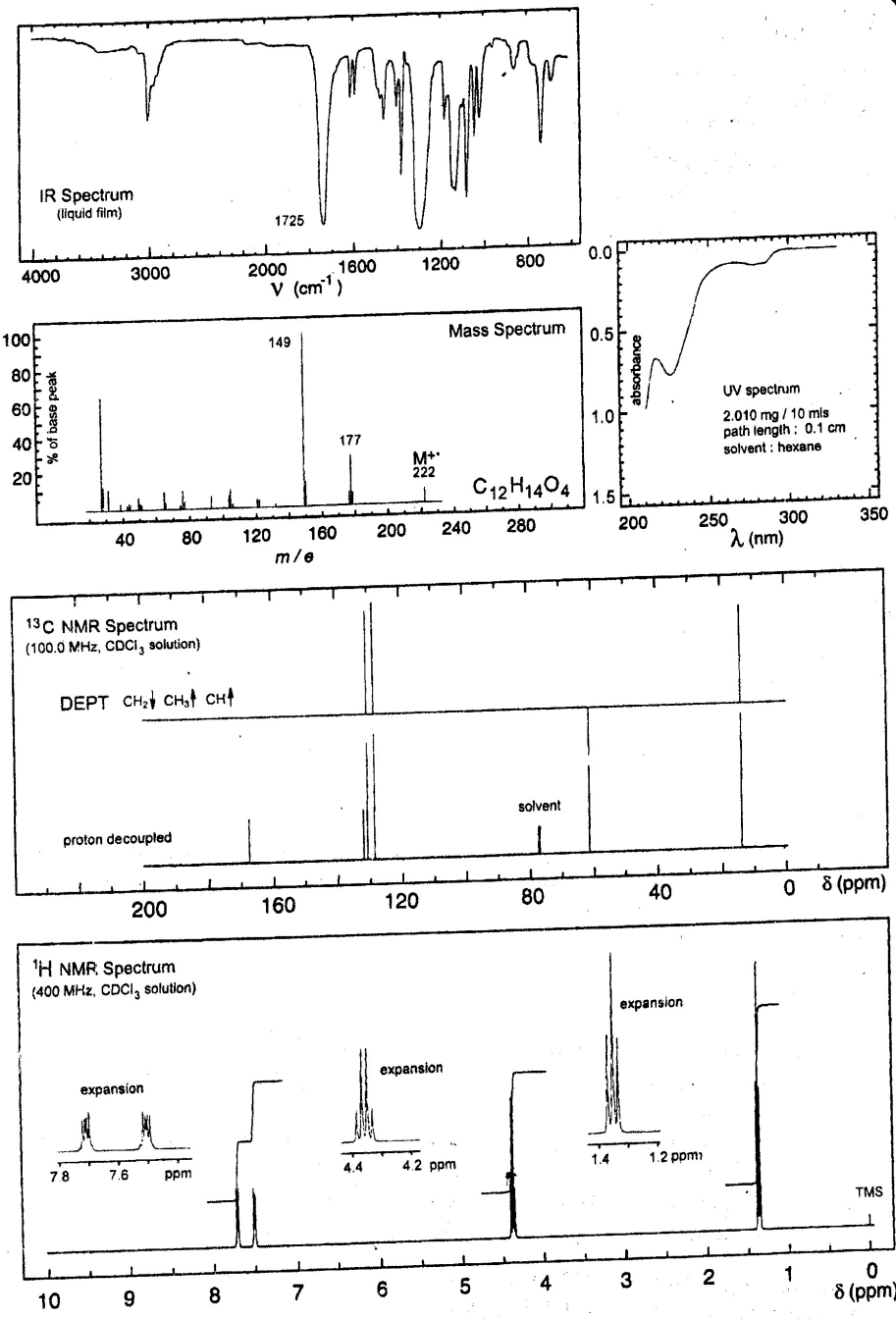
(ii) 

Q6. Draw stereochemical formulas for all the possible stereoisomers of the following compounds. Label pairs of enantiomers, and meso compounds. Tell which isomers, if separated from all other stereoisomers, will be optically active. (5 Marks)

(a) 1,2 -dibromopropane (b) 1,2,3,4 -tetrabromobutane

IR Absorptions of Common Functional Groups

Functional Group	*Absorption Location (cm^{-1})*	*Absorption Intensity*
Alkane (C–H)	2,850–2,975	Medium to strong
Alcohol (O–H)	3,400–3,700	Strong, broad
Alkene (C=C)	1,640–1,680	Weak to medium
(C=C–H)	3,020–3,100	Medium
Alkyne		
(C≡C)	2,100–2,250	Medium
(C≡C–H)	3,300	Strong
Nitrile (C≡N)	2,200–2,250	Medium
Aromatics	1,650–2,000	Weak
Amines (N–H)	3,300–3,350	Medium
Carbonyls (C=O)		Strong
Aldehyde (CHO)	1,720–1,740	
Ketone (RCOR)	1,715	
Ester (RCOOR)	1,735–1,750	
Acid (RCOOH)	1,700–1,725	


IR Spectrum
(liquid film)
1725
4000
3000
2000
1600
1200
800
ν (cm-1)
Mass Spectrum
149
177
M+·
222
C12H14O4
% of base peak
100
80
60
40
20
40
80
120
160
200
240
280
m/e
UV spectrum
2.010 mg / 10 mls
path length : 0.1 cm
solvent : hexane
absorbance
0.0
0.5
1.0
1.5
200
250
300
350
λ (nm)
13C NMR Spectrum
(100.0 MHz, CDCl3 solution)
DEPT CH2 CH3 CH
proton decoupled
solvent
200
160
120
80
40
0
δ (ppm)
1H NMR Spectrum
(400 MHz, CDCl3 solution)
expansion
7.8
7.6
ppm
expansion
4.4
4.2 ppm
expansion
1.4
1.2 ppm
TMS
10
9
8
7
6
5
4
3
2
1
0
δ (ppm)

2

	Assiut University- Faculty of Science First Semester- Final Exam 2025-2026 Chemistry Department	Program: Industrial Chemistry Level: 2 Date: Jan 14, 2026. Time: 3 h	
Course Title: Spectroscopy and Stereochemistry		Code: 311C	
Instructors: Prof. Dr. Ahmed Abdou O. Abeed			
Important:	No. of Pages 4 / No. of Questions 4	Total Mark: 50 degrees	

Part A. Spectroscopy

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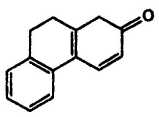
(ii) The most common method of ionization in mass spectrometry.

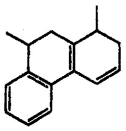
(iii) Cleavage of cyclohexene.

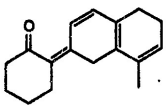
(iv) Cleavage of aliphatic carbon skeletons at branch points.

(b) Explain the appearance of the peaks at 92, 91, 77, 65, 51, 39 m/z for toluene: **(3 Marks)**

Q2. (a) Using the provided tables for rules of diene and enone absorption, calculate the λ_{max} of the following compounds: **(6 Marks)**

(i) 

(ii) 

(iii) 

(iv) 

b) Using ^{1}H-NMR and ^{13}C-NMR (Resonance OFF) spectroscopy, show how can you differentiate between the following compounds: (ONLY number of signals and multiplicity) **(6 Marks)**

(i) Chloroacetone.
(ii) Chloroacetyl chloride
(iii) Methyl cyclopentane.
(iv) Cyclopentane.
(v) Ethyl acetate
(vi) Methyl propionate

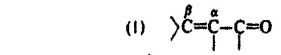
Q3. (a) Choose (T) for the true sentences or (F) for the false ones **(2 Marks)**

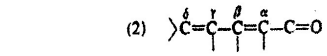
1- IR spectroscopy can distinguish between the two isomers CH_2=$CHCH_2NH_2$ and CH_3CH_2CH=NH.
2- IR spectroscopy identifies different molecules by breaking apart the molecule into individual atoms.
3- The splitting term in ^{1}H-NMR means the number of different types of protons.
4- The ^{1}H-NMR technique is considered a kind of quantitative analyses.

(b) You are provided with IR, Mass and ^{1}H-NMR spectra of an organic compound having the molecular formula C_8H_{18}. Assign the suitable structure which agrees with the provided spectra, give reasons for your assignment and show the MS fragmentation pattern with your answer **(8 Marks)**

	Homoannular (cisoid)	Heteroannular (transoid)
Parent	$\lambda = 253$ nm	$\lambda = 214$ nm
Increments for:		
Double-bond-extending conjugation	30	30
Alkyl substituent or ring residue	5	5
Exocyclic double bond	5	5
Polar groupings:		
$-OCOCH_3$	0	0
$-OR$	6	6
$-Cl$, $-Br$	5	5
$-NR_2$	60	60

Table 3.9 Woodward–Fieser rules for enone absorption

(1) 

(2) 

			λ (nm)
Parent enone in an acyclic or six-membered ring			215
Parent enone in a five-membered ring			202
Parent $\alpha\beta$-unsaturated aldehyde			207
Increments for:			
Double bond extending conjugation			30
Alkyl substituent or ring residue		α	10
		β	12
		γ and higher	18
Polar groupings:	—OH	α	35
		β	30
		γ	50
	$-O\cdot CO\cdot CH_3$	α,β,γ	6
	$-OCH_3$	α	35
		β	30
		γ	17
		δ	31
	—Cl	α	15
		β	12
	—Br	α	25
		β	30
	$-NR_2$	β	95
Exo double bond			5
Homodiene component			39
Solvent correction (see Table 3.10)			—

Good Luck

Prof. Ahmed Abdou O. Abeed

Assiut University- Faculty of Science First Semester- Final Exam 2025-2026 Chemistry Department	Program: Industrial Chemistry Level: 2 Date: Jan 14, 2026. Time: 3 h	
Course Title: Spectroscopy and Stereochemistry	Code: 311C	
Instructors: Prof. Dr. Ahmed Abdou O. Abeed		
Important: No. of Pages 4 / No. of Questions 4	Total Mark: 50 degrees	

Part A. Spectroscopy

Answer the following questions (33 Marks)

Q1. (a) Describe briefly only Four of the followings: (Giving an example). **(8 Marks)**

(i) McLafferty rearrangement

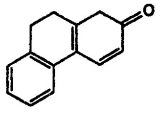
(ii) The most common method of ionization in mass spectrometry.

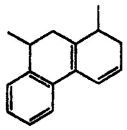
(iii) Cleavage of cyclohexene.

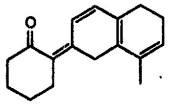
(iv) Cleavage of aliphatic carbon skeletons at branch points.

(b) Explain the appearance of the peaks at 92, 91, 77, 65, 51, 39 m/z for toluene: **(3 Marks)**

Q2. (a) Using the provided tables for rules of diene and enone absorption, calculate the λ_{max} of the following compounds: **(6 Marks)**

(i) 

(ii) 

(iii) 

(iv) 

b) Using ^{1}H-NMR and ^{13}C-NMR (Resonance OFF) spectroscopy, show how can you differentiate between the following compounds: (ONLY number of signals and multiplicity) **(6 Marks)**

(i) Chloroacetone.
(ii) Chloroacetyl chloride
(iii) Methyl cyclopentane.
(iv) Cyclopentane.
(v) Ethyl acetate
(vi) Methyl propionate

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1- IR spectroscopy can distinguish between the two isomers CH_2=$CHCH_2NH_2$ and CH_3CH_2CH=NH.
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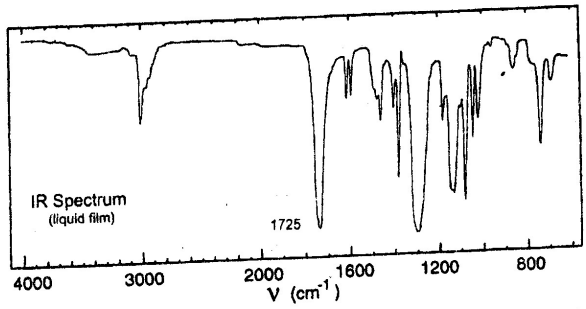
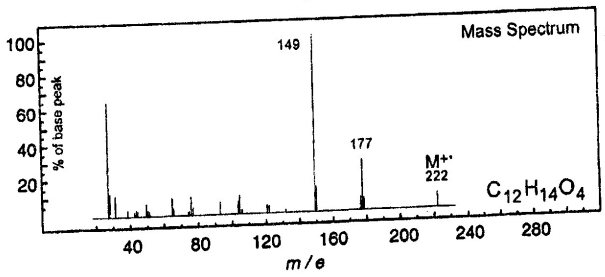
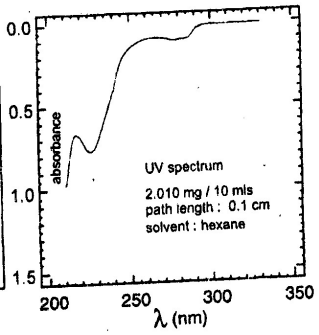
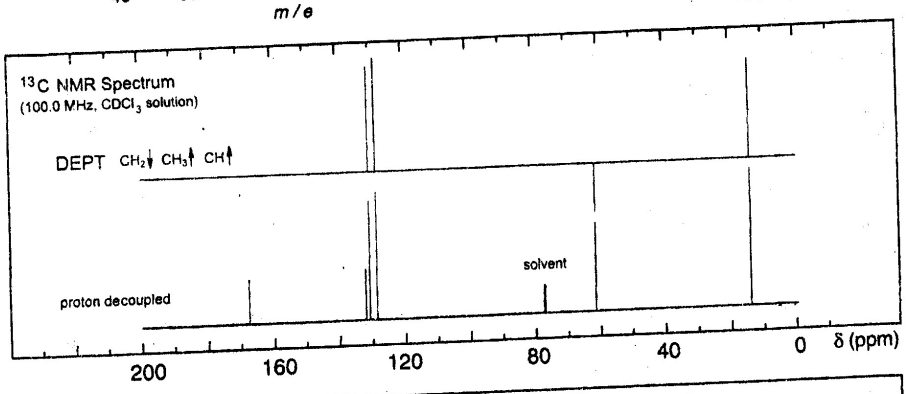
4- The ^{1}H-NMR technique is considered a kind of quantitative analyses.

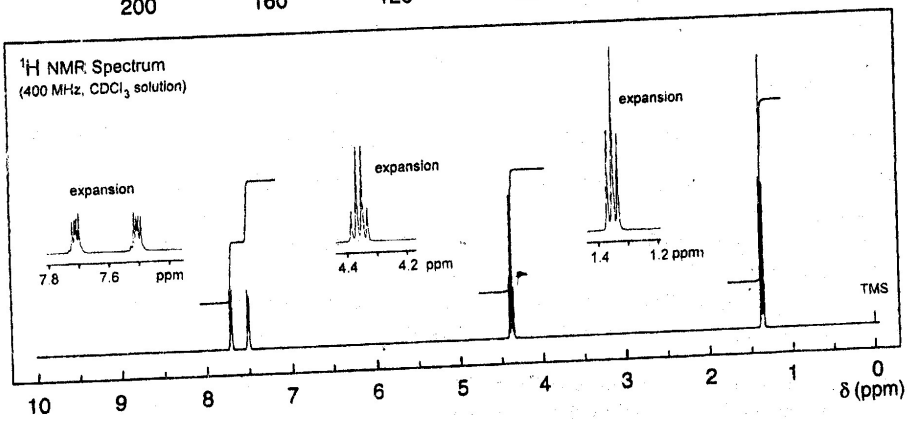
(b) You are provided with IR, Mass and ^{1}H-NMR spectra of an organic compound having the molecular formula C_8H_{18}. Assign the suitable structure which agrees with the provided spectra, give reasons for your assignment and show the MS fragmentation pattern with your answer **(8 Marks)**


IR Spectrum
(liquid film)
1725
4000
3000
2000
1600
1200
800
ν (cm-1)


Mass Spectrum
149
177
M+·
222
C12H14O4
% of base peak
100
80
60
40
20
40
80
120
160
200
240
280
m/e


absorbance
0.0
0.5
1.0
1.5
UV spectrum
2.010 mg / 10 mls
path length : 0.1 cm
solvent : hexane
200
250
300
350
λ (nm)


13C NMR Spectrum
(100.0 MHz, CDCl3 solution)
DEPT CH2 CH3 CH
proton decoupled
solvent
200
160
120
80
40
0
δ (ppm)


1H NMR Spectrum
(400 MHz, CDCl3 solution)
expansion
7.8
7.6
ppm
expansion
4.4
4.2 ppm
expansion
1.4
1.2 ppm
TMS
10
9
8
7
6
5
4
3
2
1
0
δ (ppm)

·2

Part B. Stereochemistry

Answer the following questions

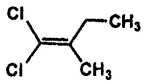
Q4. Write briefly on (with an example): (6 Marks)

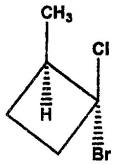
(i) Tautomerism. (ii) Chain isomers.
(iii) Geometrical Isomerism. (iv) Conformational isomerism.
(v) Enantiomers. (vi) Polarimeter.

Q5. (a) Draw all possible structural formulas for the molecular formulas: (4 Marks)

(i) $C_4H_{10}O$. (ii) C_4H_9Cl.

(b) Give a complete name of the following compounds: (2 Marks)

(i) 

(ii) 

Q6. Draw stereochemical formulas for all the possible stereoisomers of the following compounds. Label pairs of enantiomers, and meso compounds. Tell which isomers, if separated from all other stereoisomers, will be optically active. (5 Marks)

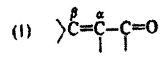
(a) 1,2 -dibromopropane (b) 1,2,3,4 -tetrabromobutane

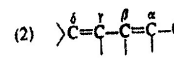
IR Absorptions of Common Functional Groups

Functional Group	*Absorption Location (cm^{-1})*	*Absorption Intensity*
Alkane (C–H)	2,850–2,975	Medium to strong
Alcohol (O–H)	3,400–3,700	Strong, broad
Alkene (C=C)	1,640–1,680	Weak to medium
(C=C–H)	3,020–3,100	Medium
Alkyne		
(C≡C)	2,100–2,250	Medium
(C≡C–H)	3,300	Strong
Nitrile (C≡N)	2,200–2,250	Medium
Aromatics	1,650–2,000	Weak
Amines (N–H)	3,300–3,350	Medium
Carbonyls (C=O)		Strong
Aldehyde (CHO)	1,720–1,740	
Ketone (RCOR)	1,715	
Ester (RCOOR)	1,735–1,750	
Acid (RCOOH)	1,700–1,725	

	Homoannular (cisoid)	Heteroannular (transoid)
Parent	$\lambda = 253$ nm	$\lambda = 214$ nm
Increments for:		
Double-bond-extending conjugation	30	30
Alkyl substituent or ring residue	5	5
Exocyclic double bond	5	5
Polar groupings:		
$-OCOCH_3$	0	0
$-OR$	6	6
$-Cl$, $-Br$	5	5
$-NR_2$	60	60

Table 3.9 Woodward–Fieser rules for enone absorption

(1) 

(2) 

			λ (nm)
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Parent enone in a five-membered ring			202
Parent $\alpha\beta$-unsaturated aldehyde			207
Increments for:			
Double bond extending conjugation			30
Alkyl substituent or ring residue		α	10
		β	12
		γ and higher	18
Polar groupings:	—OH	α	35
		β	30
		γ	50
	$-O\cdot CO\cdot CH_3$	α,β,γ	6
	$-OCH_3$	α	35
		β	30
		γ	17
		δ	31
	—Cl	α	15
		β	12
	—Br	α	25
		β	30
	$-NR_2$	β	95
Exo double bond			5
Homodiene component			39
Solvent correction (see Table 3.10)			—

Good Luck

Prof. Ahmed Abdou O. Abeed

كلية العلوم
جامعة أسيوط

Final Exam: Animal venom (217Z) **Time: Two Hours**
Chemistry/Zoology Students ٢٠٢٦/١/٢٤ **First Semester 2025/2026**

1-Choose the correct answer: (15 marks)

1-The amount of chemical entering the body is usually given as…………...of body weight. ( )
a. mg /kg b. μg/kg c. μg/g d.ng/kg

2-The efficiency of dose is dependent on the…………………………………………….
a- environmental concentration b- properties of the toxicant c. frequency of exposure d. All are True

3-The adverse effect of poisons could be………………….. ……………………..…… ………..
a. Local vs. Systemic b. Reversible vs. Irreversible c. Immediate vs. Delayed d. All are True

4- Chemicals analogous to calcium and fluoride could be storage in…………..
a. bone b. fats d-liver d. blood

5- The body has defenses mechanism against toxicity includes…………………………….
a. membrane barriers b. biotransformation enzymes c. elimination mechanisms d. All are True

6- The fundamental principles of spider venoms work by ………………………….….
a. neurotoxic b. necrotic c. a&b d. None of a&b

7- Allergic reactions occur primarily through contact with …………………………..
a. venom b. saliva c. certain body parts of invertebrates such as setae d. All are True

8- Allergic reactions can be…………………………………….……..
a. localized (swelling) b. systemic (anaphylactic shock) c. sever including death d. All are True

9- The Gila monster is venomous………………………… have a pair of venom glands in the lower jaw.
a. lizards b. birds c. amphibian d. arthropods

10- Jellyfish venom attack………………………………………
a. heart b. nervous system c. skin cells d. All are Ture

11- Symptoms of a cone snail sting can start immediately or can be delayed in onset for days. This Symptoms includes……………………………..
a. intense pain b. swelling and itching c. muscle paralysis and breathing failure d. All are True

12- The venom of snakes may be………………………………
a. neurotoxic b. myotoxic c. Haematotoxic d. All are True

13- All viperids have a pair of relatively long hollow .....that are used to inject venom from glands located towards the rear of the upper jaws
a. fangs b. tongue c. sting d. pharynx

14- The Viperidae are a family of venomous snakes belong to class.....
a. reptiles b. amphibia c. birds d. mammals

15- Cobras and Coral Snakes venoms is.....
a. Neurotoxins b. Haemotoxins c. Myotoxins d. All are True

II- Put true (T) or false (F) for each one: (20 marks)

1-Poisons are chemicals that can injure or impair body functions. ( )

2- Typical effectiveness of route of exposure is: iv > inhale > ip > im > ingest > topical. ( )

3- Distribution of toxicants is a process in which a chemical agent translocated throughout the body. ( )

4- water soluble products are filtered out of the blood by the kidney and excreted into the urine. ( )

5- All organs are affected equally by exposure to toxicants. ( )

6- Paralytic shellfish poisoning and mass mortalities of marine animals were found to be caused by several species of marine flagellates. ( )

7- Insects produce a lot of secretions consisting of chemically different substances for chemical communication. ( )

8-In bee venom, 3 toxic polypeptides have been detected: the hemolytic melittin, the neurotoxic apamin and a mast cell degranulating peptide. ( )

9-Ants of the genera *Solenopsis* produce alkaloids in their venom glands. ( )

10- The amount of venom injected by spider can vary based on the type of spider and the circumstances of the encounter. ( )

11- Brazilian spider's venom cause increased levels of nitric oxide which, in male human victims., will result in an involuntary erection that can be very painful and last hours. ( )

12- The venom of Australian funnel-web spiders contains a compound known as atracotoxin which is highly toxic to primates. ( )

13- Widow spider antivenom has been shown effective in treating steatodism. ( )

14- Systemic symptoms of scorpion venom and signs usually develop within 4 hours of the sting, and anaphylaxis and death from cardiac or respiratory failure can occur within 24 hours. ( )

15- Ticks and mites are bloodsucking ectoparasites containing anticoagulants. ( )

16- Stonefish stores its toxins in gruesome-looking spines that are designed to hurt would-be predators. ( )

17- Blue-Ringed Octopus carries enough poison to kill 26 adult humans within minutes, and there is no antidote. ( )

18- Poison dart frogs keep their poison in their skins and will sicken or kill anybody who touches or eats it. ( )

19- Most deaths from fugu happen when untrained people catch and prepare the fish. ( )

20- Antivenin only blocks further damage, it can't undo what's already been done. ( )

III- Answer on the following questions: (15 Marks)

1-Write on the adverse effect of poisons on the cells.

2- Write on the treatment of envenomation by scorpions.

3- Write on the components of Snake venom

4- **Discuss the medicinal value of snake venom**

5- Write how to measure the LD_{50} of toxic compounds.

Good luck

Dr. Hossam El-Din M Omar, Prof. of Physiology

	Assiut University-Faculty of Science First Semester-Final Exam 2025-26 Chemistry Department	Program: Applied Industrial Chemistry Level: (2) Date: 23-1-2026 Time: 2 h	
Course Title: Electrochemistry		Course Code : Chem 209	
Instructor: Prof. Abou-Elhagag Abdel-Aziz Hermas			
Important	No of pages : 2	No. of questions : 4	Total Marks: 50

Answer the following questions (15 marks)

Q1: Choose the correct answer

1- What is the oxidation number of phosphorous in H_3PO_4?

A. +4 B. +6 C. +7 D. +5

2- The salt bridge in an electrochemical cell .....

A. balance ionic flow B. adds voltage C. balance electronic flow D. other

3- The aqueous hydrochloric acid solution is a ..... electrolyte

A. weak B. strong C. moderate D. non

4- Which type of electrode is used as a reference electrode?

A. Gas electrode B. Amalgam electrode C. Metal-metal ion electrode D. Calomel electrode

5- The Nernst equation is applied to calculate ..... potential.

A. electrode B. cell C. electrochemical D. all correct

6- What is the correct half-reaction for the silver-silver chloride electrode?

A. $AgCl + e^- \rightarrow Ag + Cl^-$ B. $Ag \rightarrow Ag^+ + e^-$

C. $Ag^+ + Cl^- \rightarrow AgCl$ D. $Cl^- \rightarrow Cl_2 + e^-$

7- The ionic strength of an aqueous solution containing 0.1 M $MgCl_2$ and 0.2M NaCl is .....

A. 1.0 M B. 0.25 M C. 0.5 M D. other

8- Which of the following is not a redox reaction?

A. $Zn + Cu^{2+} \rightarrow Zn^{2+} + Cu$ B. $H_2 + Cl_2 \rightarrow 2HCl$

C. $AgNO_3 + NaCl \rightarrow AgCl + NaNO_3$ D. $2Fe^{2+} + Cl_2 \rightarrow 2Fe^{3+} + 2Cl^-$

9- The high conductivity of strong electrolytes is due to ....

A. Partial ionization B. Complete dissociation into ions

C. Non-polar solvent use D. High molecular weight

10- What is the product of the electrolysis of molten NaCl at the cathode?

A. NaCl B. Cl_2 gas C. Na metal D. other

11- The polarization resistance in a cell is due to the resistance of .....

A. electrode B. electrolyte C. connections D. all correct

12- Which ion exhibits the highest conductivity due to its small size?

A. H^+ B. OH^- C. Ca^{2+} D. K^+

13- Which of the following correctly represents the unit of conductivity (κ)?

A. Ωm B. mol/L C. V/A D. S/m

14- The factor affect concentration polarization.....

A. stirring of solution B. diffusion of ions C. concentration of reactant D. all correct

15- The E° for a cell reaction with ($\Delta G°$) = $-2.53x10^3$ $kJmol^{-1}$at 25°C and six transfer electrons is equal .....

A. 2.37 V B. 4.37 V C. 3.32 V D. other

(أنظر بالخلف)

Q2: Give True or False for the following statements **(15 marks)**

1- The amount of substance changed during electrochemical reaction is proportional to the applied potential.
2- Nafion is used as a solid electrolyte.
3- During charging of your Mobile phone, in this case the phone battery is working as galvanic cell.
4- In acidic medium, H^+ is used to balance hydrogen atoms in redox reactions.
5- The sign of electrode potential doesn't change when the electrode reaction is reversed.
6- Ohmic resistance (polarization) limit the performance of lithium-ion batteries.
7- A fuel cell is an electrochemical cell that requires a continuous supply of reactants to keep functioning.
8- In electrolytic cell, the anode is negative.
9- The silver-silver chloride electrode is a type of gas electrode.
10- Calomel electrode contains mercury and chloride ions.
11- Tap water has higher conductivity than pure water due to dissolved ions.
12- Conductivity (κ) and resistivity (ρ) are inversely related.
13- Increasing temperature increase ionic conductivity.
14- Kohlrausch's Law is valid at all concentrations.
15- The lead storage batter is recharged by reversing its chemical reactions.

Q3 Answer only two of the following: **(10 marks)**

1) Determine the activity coefficient of the Mg^{2+} ion in an aqueous solution that is 0.005 M $Mg(NO_3)_2$. Where, A=0.509.
2) Discuss the factors affecting the conductivity of solution.
3) The specific resistance of an electrode is R_Ω=10.0 $\Omega \cdot cm^2$ and the passed current density is I = 5.00×10^{-4} A/cm^2, calculate the ohmic overpotential η_{ohm} in mV.

Q4 Answer only two of the following: **(10 marks)**

1) The resistance (R) of 0.01 M KCl solution is measured using a conductivity cell with a cell constant (G^*) of 1.25 cm^{-1}. The resistance is 150 Ω. Calculate the specific conductivity (κ) and molar conductivity .
2) How much Ca will be produced in an electrolytic cell of molten $CaCl_2$ if a current of 0.234 A is passed through the cell for 2.0 hours? (mol. Mass Ca: 40.0, F=96500 C mol^{-1})
3) A voltaic cell is constructed with two Zn^{+2} - Zn electrodes. The two cell compartments have $[Zn^{+2}]$ = 1.8M and $[Zn^{+2}]$ = 1.0×10^{-2}M. (a) Which electrode is the anode of the cell? (b) What is the $E°_{cell}$? (c) What is the emf of the cell? (d) For each electrode, predict whether the $[Zn^{+2}]$ will increase, decrease or stay the same as the cell operates.

مع اطيب التمنيات بالتوفيق..

الاستاذ الدكتور/ أبوالحجاج عبدالعزيز هرماس

	Assiut University- Faculty of Science Frist Semester- Final Exam 2025-2026 Chemistry Department	Program: Industrial Chemistry Level : (2) Date: 12/1/2026 Time: 2 h	
Course Title: Physical Chemistry		Code: 203 (IC) Industrial Chemistry	
Instructors: Prof. Dr. Maher M. Girgis and Dr. Ahmed G. Mohamed			
Important:	No. of pages 3	No. Of questions 3	Total Mark: 50 Marks

Answer the following questions: **(50 Marks)**

(A) Solid State Chemistry: **(17 Marks)**

1- Explain what is meant by two only from the following terms (Give an example if possible):(5 Marks)

i) Non-metallic network solids. ii) Molecular solids. iii) Point defects in a crystal.

2- Complete the following: - (3 Marks)

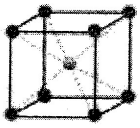
i) Glycine molecules are held in a sheet structure by _____ and _____. (2 Marks)

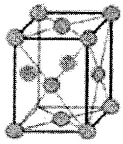
ii)

...ABABABAB...

This arrangement of atoms in a crystal structure is known as _____. (1 Mark)

3- Write the crystal system which corresponds to the following structures: (2 Marks).

i)  $a = b = c$, $\alpha = \beta = y = 90^o$

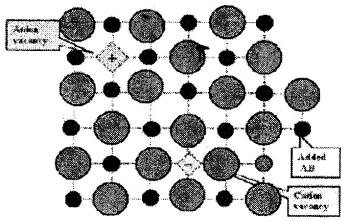
ii)  $a \neq b \neq c$, $\alpha = \beta = y = 90^o$

4- Find the Miller Indices of the dashed planes in the following crystals: (2 Mark)

i) 

ii) 

5- What is the type of defect present in the following diagram: (1 Mark)



6- Describe what happen in the crystal structure when substitutional impurities of cations (Ca^{2+} ions) / or anions (O^{2-}) are present in a host crystal of NaCl. (4 Marks)