A: B: C: D:

Qn 2: Dehydrohalogenation of menthyl chloride **(E)** takes place slowly and gives only one product, whereas the dehydrohalogenation of neomenthyl chloride **(F)** is much faster and yields two products. Explain. *6 marks*

E: F:

Qn 3: Determine the mechanism for each of the following reactions and draw the products, including stereochemistry. *4 marks*

i. ii.

Qn 4: Using curved arrows, draw a stepwise detailed mechanism for the following reaction: *4 marks*

Qn 5: Draw the two chair conformations of compound **G** below and calculate the energy for each conformation. Which conformation is more stable? What is the energy difference between the two conformations? (1,3-Diaxial interactions in kJ/mol: H/CH_3 = 7.4, H/CH_2CH_3 = 7.6; $H/C(CH_3)_3$ = 20.0; CH_3/CH_3 = 15; CH_3/CH_2CH_3 = 18) *6 marks*

G:

Qn 6: Using appropriate reaction mechanisms give the major product(s) expected for each of the following reactions: *8 marks*

i. ii.

iii. iv.

THE UNIVERSITY OF DODOMA
SCHOOL OF PHYSICAL SCIENCES - CNMS
DEPARTMENT OF CHEMISTRY

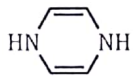
CH 214: ORGANIC CHEMISTRY II TEST 2

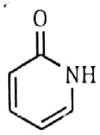
Date: 25.01.2018 **TIME: 18:15 – 19:30**

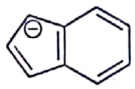
Answer ALL Questions

1. Give mechanism and product(s) expected from the reaction between benzene and propyl chloride in presence of a Lewis acid ($AlCl_3$). *3 marks*

2. Label the following molecules as aromatic, anti aromatic, or nonaromatic. Give reasons to support your selection. Assume planarity. *3 marks*

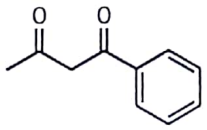
a) 

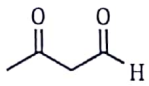
b) 

c) 

3. Explain change in molecular stability after ring flipping of *trans*-1,2-Dimethylcyclohexane in its chair conformation. *3 marks*

4. Write structural formulas for the most stable enol isomers of the β-dicarbonyl compounds below: *2 marks*

a) 

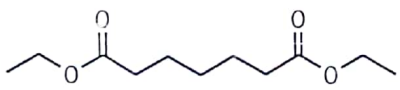
b) 

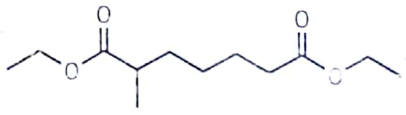
5. Chlorination of 2-butanone yields two isomeric products, each having the molecular formula C_4H_7ClO. What are these two compounds? *2 marks*

   a) Write structural formulas for the enol intermediates that lead to each of these compounds. *2 marks*

   b) Using curved arrows, show the flow of electrons in the reaction of each of the enols with Cl_2. *2 marks*

6. Write the structure of the Dieckmann cyclization product formed on treatment of each of the following diesters with sodium ethoxide, followed by acidification. *3 marks*

a) 

b) 

THE UNIVERSITY OF DODOMA
SCHOOL OF PHYSICAL SCIENCES - CNMS
DEPARTMENT OF CHEMISTRY

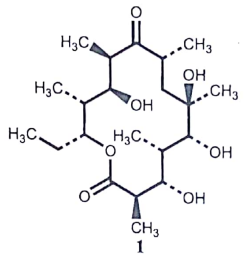
CH 214: ORGANIC CHEMISTRY II TEST 1

Date: 21.12.2017 **TIME: 18:15 – 19:30**

Answer ALL Questions

1. Draw stereochemical formulas and assign configurations for all the possible stereoisomers of the $CH_3CHBrCHBrCH_3$ *3 marks*

2. Erythronolide B (**1**) is the biological precursor of erythromycin, a broad-spectrum antibiotic. How many chirality centers does erythronolide B have? *2.5 marks*



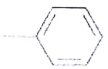
1

3. What are the stereochemical configurations of the two diastereomers of (2*S*,4*R*)-2,4-octanediol? *4 marks*

4. Assign Cahn–Ingold–Prelog priorities to the following sets of substituents: *4 marks*

(a) —CH=CH_2, —$CH(CH_3)_2$, —$C(CH_3)_3$, —CH_2CH_3

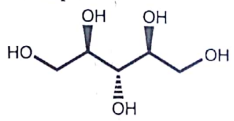
(b) —C≡CH, —CH=CH_2, —$C(CH_3)_3$,



(c) —CO_2CH_3, —$COCH_3$, —CH_2OCH_3, —CH_2CH_3

(d) —C≡N, —CH_2Br, —CH_2CH_2Br, —Br

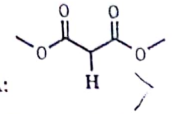
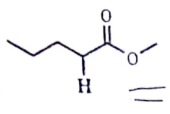
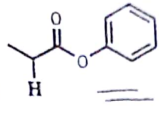
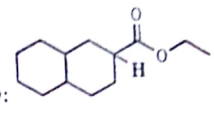
5. On catalytic hydrogenation over a platinum catalyst, ribose is converted into ribitol (**2**). Is ribitol optically active or inactive? Explain. *3 marks*



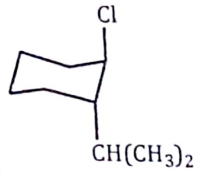
2

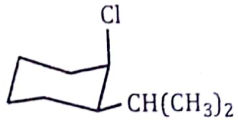
6. Which of the isomeric alcohols having the molecular formula $C_5H_{12}O$ are chiral? Which are achiral? *3.5 marks*

...ing acidity: *2 marks*

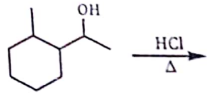
A:  B:  C:  D: 

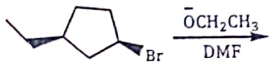
Qn 2: Dehydrohalogenation of menthyl chloride **(E)** takes place slowly and gives only one product, whereas the dehydrohalogenation of neomenthyl chloride **(F)** is much faster and yields two products. Explain. *6 marks*

E: 

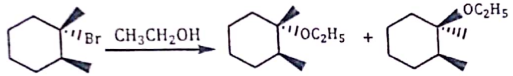
F: 

Qn 3: Determine the mechanism for each of the following reactions and draw the products, including stereochemistry. *4 marks*

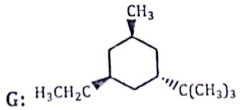
i. 

ii. 

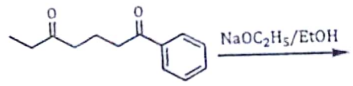
Qn 4: Using curved arrows, draw a stepwise detailed mechanism for the following reaction: *4 marks*

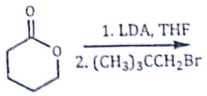


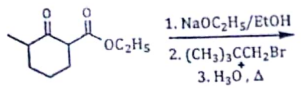
Qn 5: Draw the two chair conformations of compound **G** below and calculate the energy for each conformation. Which conformation is more stable? What is the energy difference between the two conformations? (1,3-Diaxial interactions in kJ/mol: H/CH_3 = 7.4, H/CH_2CH_3 = 7.6; $H/C(CH_3)_3$ = 20.0; CH_3/CH_3 = 15; CH_3/CH_2CH_3 = 18) *6 marks*

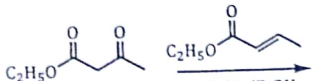
G: 

Qn 6: Using appropriate reaction mechanisms give the major product(s) expected for each of the following reactions: *8 marks*

i. 

ii. 

iii. 

iv. 

23

DEPARTMENT OF CHEMISTRY

CH 214: ORGANIC CHEMISTRY II – TEST 1 (2016/2017)

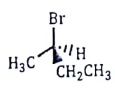
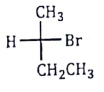
Name: KALINGA LATWI Reg. No. T/UDOM/2015/00835

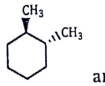
30

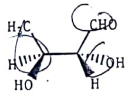
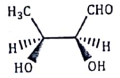
Answer ALL Questions (In the space provide, use the extra sheet for rough work, don't detach it)

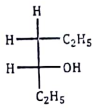
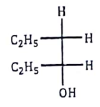
Date: 22.18.2016 Time: 18:15 – 19:45

Qn 1: What is the relationship between the following compounds

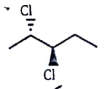
i.  and  Are enantiomers ✓

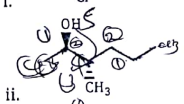
ii.  and  Are enantiomer ✓

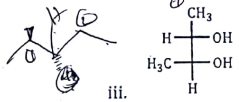
iii.  and  Are diastereomers ✓

iv.  **and**  Identical compound ✓

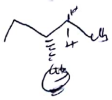
Qn 2: Give the IUPAC name (including configurations) for each of the following compounds:

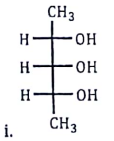
i.  (2S,3R)-2,3-dichlolopentane ✓5

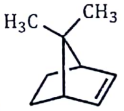
ii.  (2R,3S)-3-methylhexan-2-ol ✓5

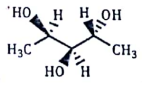
iii.  (2S,3R)-2,3-butandiol

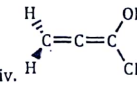
Qn 3: Indicate the optical activity (by writing **ACTIVE** or **INACTIVE**) of each of the following compounds:



i.  Inactive ACTIVE ✓

ii.  ACTIVE ✓

iii.  ACTIVE ✓

iv.  INACTIVE ✓

Qn 4 i. Pure (*R*)-mandelic acid has a specific rotation of –154°. If a sample contains 60% of the *R* isomer and 40% of its enantiomer, what is [α] of this solution? −30.8° ✓5

THE UNIVERSITY OF DODOMA
COLLEGE OF NATURAL AND MATHEMATICAL SCIENCES
SCHOOL OF PHYSICAL SCIENCES
DEPARTMENT OF CHEMISTRY

Course Code: **CH 215**; Course title: Instrumental Methods in Analytical Chemistry; **Test -1**; Semester 1; Academic year: 2016/2017; Date: 08-01-2017; Max. Marks: 15; Time: 03:30-05:00 PM

Name of the Student: KALINGA LAWI

Reg. No.: T/UDOM/2015/00835

Program (Put the √ mark in the box given):
- **2nd year B. Sc. Chemistry** ☑
- **3rd year B. Sc. Education Native** ☐
- **3rd year B. Sc. Education STR's** ☐
- **2nd year B. Ed. Science** ☐
- **3rd year B. Ed. Science** ☐

Instructions to the candidate:
1. The examination paper consists of 1 printed page.
2. Make sure that your exam paper contains **Twelve Questions.**
3. Write the question numbers in the left margin of the answer sheets.
4. Mobile phones are not allowed in the examination room.
5. Marks will be awarded for correctness and logical presentation.
6. Use proper labeling for all the diagrams.

4.5
15

Answer **All** the Questions in their **serial number order**. Marks are indicated at the end of each question.

1. What is the difference between atomic absorption and atomic emission spectrum? **(1 mark)**
2. Draw a neat labeled diagram of Bunsen Prism Monochromator. **(1 mark)**
3. Give any two examples for resonance line sources. **(1 mark)**
4. Write all the advantages of Plasma Emission Spectrophotometer over Flame Emission Spectrophotometer. **(1 mark)**
5. What is the difference between AFS and GF-LEAFS? **(1 mark)**
6. What is the selection rule for UV-Visible Absorption Spectroscopy? What are the best organic colouring agents for the determination of Iron and Nickel, respectively using UV-Visible Spectrophotometer? **(1 mark)**
7. Explain the working of Bragg's x- ray diffractometer. **(1 mark)**
8. Write a note on High Resolution TGA. **(1 mark)**
9. Write the application of TGA for the polymer studies with their thermograms. **(1 mark)**
10. What are the changes that take place, when a salt solution is introduced into the flame? Show all the changes with a neat labeled diagram. **(2 marks)**
11. Write any four situations for the deviations from Beer-Lamberts law. **(2 marks)**
12. Explain the functioning of ionization chamber for the detection of x-rays with a neat labeled diagram. **(2 marks)**

25.01.2016 CH 214: ...

THE UNIVERSITY OF DODOMA
COLLEGE OF NATURAL AND MATHEMATICAL SCIENCES
SCHOOL OF PHYSICAL SCIENCES
DEPARTMENT OF CHEMISTRY

Course Code: CH 215; Course title: Instrumental Methods in Analytical Chemistry; Test -2; Semester 1; Academic year: 2016/2017; Date: 05-02-2017; Max. Marks: 15; Time: 03:30-05:00 PM

Name of the Student: KALINGA LAWI

Reg. No.: T/UDOM/2015/00835

Program (Put the √ mark in the box given):
- 2nd year B. Sc. Chemistry ☑
- 3rd year B. Sc. Education Native ☐
- 3rd year B. Sc. Education STR's ☐
- 2nd year B. Ed. Science ☐
- 3rd year B. Ed. Science ☐

Instructions to the candidate:
1. The examination paper consists of 1 printed page.
2. Make sure that your exam paper contains Six Questions.
3. Write the question numbers in the left margin of the answer sheets.
4. Mobile phones are not allowed in the examination room.
5. Marks will be awarded for correctness and logical presentation.
6. Use proper labeling for all the diagrams.

12.0 / 15

Answer **All** the Questions in their **serial number order**. Marks are indicated at the end of each question.

1. The following data give the recovery of bromide from spiked samples of vegetable matter in µg/g, measured by using a gas–liquid chromatographic method. The same amount of bromide was added to each specimen.

Tomato	777	790	759	790	770	758	764
Cucumber	782	773	778	765	789	797	782

Test whether the recoveries from the two vegetables have variances which differ significantly. **(3 marks)**

2. Describe all the parts of voltammetry instrumentation. **(3 marks)**
3. Mention all the parts of HPLC. Write the function of each part. **(3 marks)**
4. Write any four limitations of metallic electrode of first kind. **(2 marks)**
5. In an electrolytic deposition of Ag, a current of 0.05 A has passed through the cell for 5 min. Calculate the mass of Ag deposited. (Formula weight of Ag is 107.87 g/mol.) **(2 marks)**
6. Draw a neat labeled block diagram of GC. **(2 marks)**

Table A.4 Critical values of F for a two-tailed test ($P = 0.05$)

ν_2 \ ν_1	1	2	3	4	5	6	7	8	9	10	12	15	20
1	647.8	799.5	864.2	899.6	921.8	937.1	948.2	956.7	963.3	968.6	976.7	984.9	993.1
2	38.51	39.00	39.17	39.25	39.30	39.33	39.36	39.37	39.39	39.40	39.41	39.43	39.45
3	17.44	16.04	15.44	15.10	14.88	14.73	14.62	14.54	14.47	14.42	14.34	14.25	14.17
4	12.22	10.65	9.979	9.605	9.364	9.197	9.074	8.980	8.905	8.844	8.751	8.657	8.560
5	10.01	8.434	7.764	7.388	7.146	6.978	6.853	6.757	6.681	6.619	6.525	6.428	6.329
6	8.813	7.260	6.599	6.227	5.988	5.820	5.695	5.600	5.523	5.461	5.366	5.269	5.168
7	8.073	6.542	5.890	5.523	5.285	5.119	4.995	4.899	4.823	4.761	4.666	4.568	4.467
8	7.571	6.059	5.416	5.053	4.817	4.652	4.529	4.433	4.357	4.295	4.200	4.101	3.999
9	7.209	5.715	5.078	4.718	4.484	4.320	4.197	4.102	4.026	3.964	3.868	3.769	3.667
10	6.937	5.456	4.826	4.468	4.236	4.072	3.950	3.855	3.779	3.717	3.621	3.522	3.419
11	6.724	5.256	4.630	4.275	4.044	3.881	3.759	3.664	3.588	3.526	3.430	3.330	3.226
12	6.554	5.096	4.474	4.121	3.891	3.728	3.607	3.512	3.436	3.374	3.277	3.177	3.073
13	6.414	4.965	4.347	3.996	3.767	3.604	3.483	3.388	3.312	3.250	3.153	3.053	2.948
14	6.298	4.857	4.242	3.892	3.663	3.501	3.380	3.285	3.209	3.147	3.050	2.949	2.844
15	6.200	4.765	4.153	3.804	3.576	3.415	3.293	3.199	3.123	3.060	2.963	2.862	2.756
16	6.115	4.687	4.077	3.729	3.502	3.341	3.219	3.125	3.049	2.986	2.889	2.788	2.681
17	6.042	4.619	4.011	3.665	3.438	3.277	3.156	3.061	2.985	2.922	2.825	2.723	2.616
18	5.978	4.560	3.954	3.608	3.382	3.221	3.100	3.005	2.929	2.866	2.769	2.667	2.559
19	5.922	4.508	3.903	3.559	3.333	3.172	3.051	2.956	2.880	2.817	2.720	2.617	2.509
20	5.871	4.461	3.859	3.515	3.289	3.128	3.007	2.913	2.837	2.774	2.676	2.573	2.464

ν_1 = number of degrees of freedom of the numerator; ν_2 = number of degrees of freedom of the denominator.

12/15

THE UNIVERSITY OF DODOMA
Embracing Knowledge

CH 217: FOOD AND BEVERAGES CHEMISTRY. TEST 2.

ANSWER ALL QUESTIONS **TIME: 45 Minutes**

NAME KALINGA LAWI REG.NO T/UDOM/2015/00835

1. There are three basic objectives for the preservation of foods. Mention them: **[3 marks]**
   i. To increase shelf life
   ii. To prevent food from being spoiled by micro-organisms
   iii. To make prepared good available any place.

2. Pasteurization is named after its inventor, Louis Pasteur, a French chemist. Briefly explain what does it mean? **[1 mark]**
   Pasteurization this is the method of food preservation by which food is bottled to a high temperature and then cooled so micro organism will be killed at the high temperature or if any remain will be killed at low temperature after cooling.

3. Chilling and freezing has become the most popular domestic method of preserving food over the past 50 years in which both two methods describes the preservation of food under reduced temperature. Outline **two** major challenges associated with this method of food preservation. **[3 marks]**
   i. Freezing lead to cell destruction after water being frozen form a solid crystal which cause the destruction of cell
   ii. This method was not fully safe because after freezing if food allowed to return to normal condition bacteria and micro-organism will still remain living so it is safe only during freezing time but do not kill the bacteria and micro organisms.

4. (a) Give the meaning of the following terms as applied in Food and Beverages: **[5 marks]**
   i. Genetically modified food is the food which their genetical material DNA have been altered to change their properties such as increase the production, decrease the ripening time, change the flavor

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ii. Pickling Is the process of ~~food~~ preservation by which food substance is cooled to low temperature about 1°C to 4°C.

iii. Low density Lipoprotein (LDP)
~~It is bad lipo~~ It is the type of lipoprotein which carries cholesterol from the liver to another part of the body and during transfer of this cholesterol couples some to remain in the blood vessels as a result to high blood pressure. It is called bad lipoprotein because it cause deffi ciency to the body.

iv. Irradiation Is the process of food preservation by which food substance is exposed to the radiant energy (close) ruches gama rays, electron beam, X-ray about with low energy to kill the micro organism, bacteria and to stop enzymatic activity so as the food can remain safe.

v. Shelf life Is the period of time which food substance can be preserved or remain safe starting from a time it was produced.

(b) (i) Your community does not have a refrigerator to keep foods like meat safely. What traditional meat preservation method would you recommend for the community in order to keep meat safe for many days and why? **[2 marks]**

Drying and Salting is the best methods for meat preservation traditionary. Salt is taken to meat and the meat is then meat dried. The aim of drying is to remove water (dehydration of water from meat) and the aim of salt is to ensure the dryness of meat by absorbing the wet from the meat day after day. Also due to presence of salt micro organism will never amee closer.

(ii) Give the SI Unit for the radiation dose used during food irradiation Joule/mol **[1 mark]**

(iii). Which representation of a carbohydrate can a hemiketal or hemiacetal be observed?

(a) Pyranose ring

(b) Haworth projection

(c) Straight chain

(d) Chair/boat configuration

(iv). Which of the carbohydrate molecules are non-reducing agents?

(a) Glucose

(b) Maltose

(c) Fructose

(d) Sucrose

(v). Which of these ~~are~~ correct combinations of monosaccharides to form disaccharides?

(i)- Glucose + Glucose = Maltose

(ii) Glucose + fructose = Lactose

(iii) Glucose + fructose = Sucrose

(iv) Glucose + galactose=Lactose

(a) (i),(ii),(iii) only

(b) (ii) only

(c) (i),(iii),(iv)only

(d) All of the above

(vi). What test is used for reducing sugars:

(a) Biuret test

(b) Ninhydrine test

(c) Glucose Oxidase system

(d) Benedict's test

(vii). Give the uses of polysaccharides Amylose, Ceilulose and Glycogen in the right order:

(a) Storage , structure, Storage

(b) Structure , storage, structure

(c) Storage , storage, structure

(d) Structure,storage,storage

(viii). What are the functions of carbohydrates?

(a) For repair of body tissues.

(b) Energy sparer.

(c) A source of energy plays key role in structure and storage.

(d) To speed up chemical reaction.

(ix). D & L Designation can be used to?

(a) Name glucose molecules

(b) Observe chiral centers

(c) Transform glucose molecules into either pyranose or furanose rings

(d) To prepare a glucose molecule for bonding to form Disaccharide

Date: ...

KALINGA LAWI T/UDOM/2015/00835

16/20

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DEPARTMENT OF CHEMISTRY

CH 217: FOOD AND BEVERAGES CHEMISTRY

TEST ONE (Answer all questions) **TIME: 75 Minutes**

Qn 1. Circle the letter of the most correct answer. [10 Marks]

(i). Which of these are examples of epimers?

(a) Glucose & Maltose

(b) Lactose & Galactose

(c) Glucose & Galactose

(d) Lactose & mannose

(ii). What are the different ways to represent a carbohydrate molecule?

(a) Pyranose ring, furanose ring, straight chain

(b) Straight chain, Haworth Projection,chair/boat configuration.

(c) Pyranose ring, straight chain,chair/boat configuration

(d) Furanose ring, straight chain, Haworth projection

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(x). What are the two structures making up starch?

(a). Amylose and cellulose

(b). Amylose and amylopectin

(c). Amylopectin and cellobiose

(d). Cellobiose and cellulose

(xi). Is Fructose a non-reducing sugar and why?

(a). No because it becomes reduced to a brick red colour with benedict's solution

(b). Yes because it becomes reduced to a brick red colour with benedict's solution.

(c). Yes because it isn't reduced in benedict's solution, colour remains blue.

(d). No because it isn't reduced in benedict's solution, colour remains blue.

(xii). What is the name of the bond formed between glucose and galactose monosaccharides to produce the disaccharide lactose?

(a). Alpha 1,2 glycosidic bond

(b). Beta 1,4 glycosidic bond

(c). Alpha 1,4 glycosidic bond

(d). Beta 1,2glycosidic bond

(xiii). Which of the following statements about dietary fiber is not true?

a) dietary fiber is found in fruits, vegetables, legumes and whole grains;

b) dietary fiber provides structure in plant cell walls;

c) dietary fiber is easily digested by digestive enzymes;

d) none of the above.

(xiv). Which of the following is not an example of a sugar alcohol?

a) sorbitol

b) mannitol

c) xylitol

d) galactitol

(xv). Which of the following statements about amino acids is correct?

(a) Amino acids are classified according to the structures and properties of their side chains.

(b) Amino acids are uncharged at neutral pH.

(c) Amino acids in proteins are mainly in the D-configuration.

(d) Twenty four amino acids are commonly used in protein synthesis.

(xvi). Which type of bonding is responsible for the secondary structure of proteins?

(a) Disulphide bridges between cysteine residues.

(b) Hydrogen bonding between the C=O and N-H groups of peptide bonds.

(c) Peptide bonds between amino acids.

(d) Salt bridges between charged side chains of amino acids.

(xvii). Which term below best defines the 'quaternary structure' of a protein?

(a) The arrangement of two or more polypeptide subunits into a single functional complex

(b) The folding of the polypeptide backbone in three-dimensional space.

(c) The interaction of amino acid side chains.

(d) The sequence of amino acids in a polypeptide chain.

(xviii). Which of the following most accurately describes how secondary structures in proteins are stabilized?

(a) Through ionic bonds operating between oppositely charged amino acid side chains.
(b) Through covalent bonds joining different parts of the peptide backbone.
(c) Through hydrogen bonds between different amino acid side chains.
(d) Through hydrogen bonds joining different parts of the peptide backbone.

(xix). Which amino acid can form disulphide bonds?

(a) Glycine.
(b) Proline.
(c) Glutamate.
(d) Cysteine.

(xx). Which of the following best describes a protein domain?

(a) The α-helical portion of a protein.
(b) A discrete region of polypeptide chain that has folded into a self-contained three-dimensional structure.
(c) The β-pleated sheet portion of a protein.
(d) A feature that rarely occurs in globular proteins.

Consumption of added sugars provides essential nutrients while providing little if any, of the calories we need. F

During protein folding,hydrophobic amino acids tend to arrange themselves on the outside the molecule while hydrophilic amino acids arrange themselves inside. F

Molecular chaperones are small proteins that guide the folding and can help keep the new protein from associating with the wrong partner. T

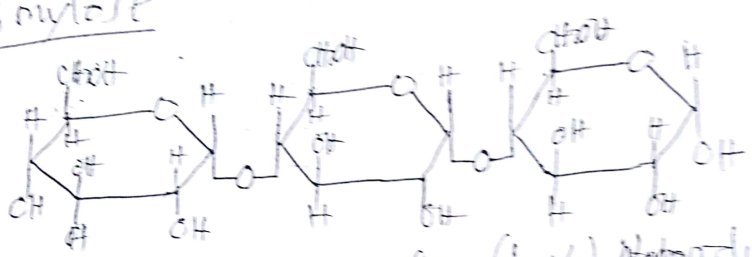
A globular protein determines the structure while fibrous protein determines the shape of a cell. F

Fill the empty spaces in the table below by providing the *monomers* and *polymers* of the four classes of organic compounds. **[2.5 Marks]**

CLASS	MONOMER	POLYMER
CARBOHYDRATE	MONOSACCHARIDE	POLYSSACHARIDE
LIPIDS	GLYCERIDE	TRIGLYCERIDE
PROTEIN	AMIO ACIDS	GLOBULAR PROTEIN

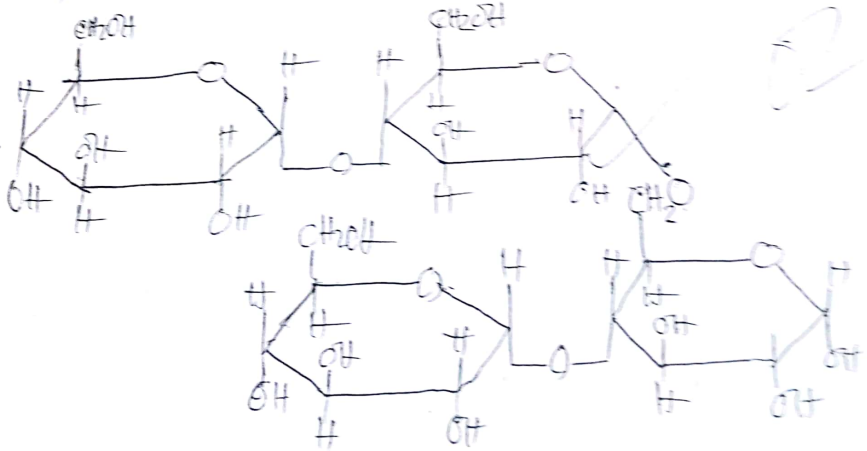
Qn 4 (a) Plants store glucose as amylose or amylopectin which are glucose polymers collectively called starch. Use diagrams to show the structural difference between amylose and amylopectin. **[2 marks]**

Amylose



form (1→4) glycosidic bond

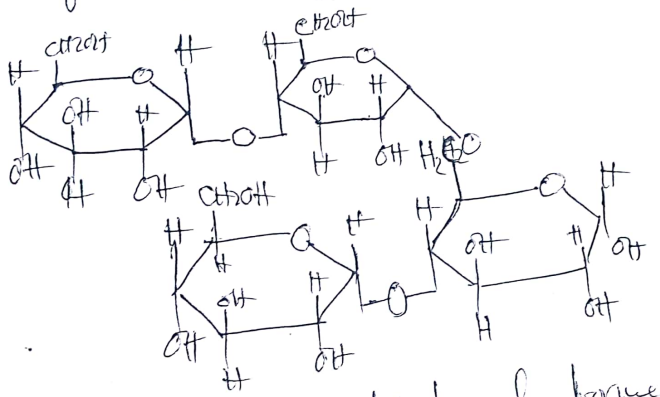
Amylopectin



form (1,4) and (1,6) glycosidic bond

(b) Describe how amylopectin differs with glycogen, a glucose storage polymer in animals. **[0.5 marks]**

Amylopectin as the storage polymer in plant differ from glycogen by forming few (1→6) linkages branches compared to that formed by Glycogen. even both form (1→4)-linkage.

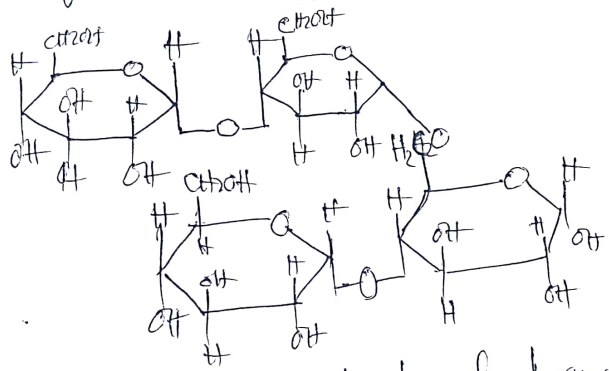


(1→6) glycosidic bond formed by both Amylopectin and Glycogen but Glycogen form many branches of (1→6)-glycosidic bond.

ALL THE BEST

(b) Describe how amylopectin differs with glycogen, a glucose storage polymer in animals. **[0.5 marks]**

Amylopectin as the storage polymer in plant differ from glycogen by forming few (1→6) linkages branches compared to that formed by Glycogen. even both form (1→4)-linkage.



(1→6) Glycosidic bond formed by both Amylopectin and Glycogen but Glycogen form many branches of (1→6)-glycosidic bond.

ALL THE BEST

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DEPARTMENT OF CHEMISTRY

CH 213: TRANSITION ELEMENTS CHEMISTRY

CONTINUOUS ASSESSMENT TEST 2 (CAT 2)

15/30 = 7.5/15

TIME: 1 HOUR

ATE: 12th February, 2017

me: KALINGA LAWI Reg. #: T/UDOM/2015/00235

nswer all questions

1. (a) Differentiate metal ore from gangue

Gangue is earthy or rock materials from which the metal ore is found but metal ore is the material from which a pure metal is extracted.

(b) Give short notes on froth floatation.

is the method of ore concentration or purification of ore whereby a crushed ore fine powder is mixed with water or spread on to purify the ore and it involves formation of bubles which floats on the top of water. 5/5

2. Explain why copper is refined by electrolytic reduction after chemical reduction.

Copper is refined by electrolysis because of their aqueous solution of $CuSO_4$ because copper ions acts as electrodes so during electric current passage will cause impure copper ions to move to pure cathode. 5/5

3. How can distillation method be used for metal purification purpose.

distillation method involve heating impure metal to form vapour of pure metal which collected and condensed to get a pure metal but while impurities will not form vapour & will remain to container. 5/5

4. Mention four impurities that are removed during extraction of iron.

i/ Arsenic(As) ii/ Sulphide (S) iii/ Antimony (Sb) which are removed by oxidation after treated with oxygen gas and iv/ Calcium silicate ($CaSiO_3$). 3.5/5

5. When any lanthanide metal is dropped in container having hot water with red and blue litmus papers a chemical reaction takes place. With the aid of an equation, record all the changes that take place during the reaction

$2La_{(s)} + 6H_2O_{(l)} \longrightarrow 2La(OH)_3 + 3H_{2(g)}$ 1.5/5

due to formation of $La(OH)_3$ which is bases will lead to change the blue litmus paper to red.

BT BSC CHEMISTRY

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DEPARTMENT OF CHEMISTRY

CH 213: TRANSITION ELEMENTS CHEMISTRY

CONTINUOUS ASSESSMENT TEST 1 (CAT 1)

DATE: 15th January, 2017 **TIME: 1 HOUR**

Name: KALINGA LAWI ..... **Reg. #:** T/UDOM/2015/00835

General Instructions:

1. Answer all questions
2. This test consists of parts A, B, C and D
3. Follow the instruction(s) given in each part
4. Give all answers in this question paper
5. Some useful information: Sc = 21, Ti = 22, V = 23, Mn = 25, Fe = 26, Ni = 28, Cu = 29, Zn = 30.

365/50 = 11/15

PART A: Choose and circle the letter of the correct answer (1 marks @)

1. One of the following factors affects the stability of electronic configuration:

A. Nature of the ligands

(B) Oxidizing condition ✓

C. Reducing property

D. Presence of catalyst

2. The ground state electron configuration of Fe^{3+} is:

(A) $[Ar]3d^6 4s^2$ B. $[Ar]3d^3 4s^2$ C. $[Ar]3d^6 4s^0$ (D) $[Ar]3d^5 4s^0$

3. Consider the coordination compound, $Na_2[Pt(CN)_4]$. The Lewis base is:

A. $[Pt(CN)_4]^{2-}$ B. Pt C. Pt^{2+} (D) CN^- ✓

4/5

4. Which transition metal ion is expected to high oxidation number?

A. Ti_2O_3 B. VO (C) MnO_4^- D. NiO ✓

5. The atomic size of transition elements increases gradually down the group due to:

A. Increase of number of shells down the group.

B. Screening and shielding effect.

1

C. Lanthanide contraction.

D. Decrease in nuclear charge.

PART B: Choose the correct answer from LIST B that corresponds with LIST A (1 mark @)

LIST A	LIST B
6. Chelating agent	A. Weak ligands
7. $K_2[PtCl_4]$	B. Strong ligands
8. Ferromagnetic	C. Very costful in industries
9. Catalysts	D. Serves fuels in industries
10. High spin complexes	E. Strongly attracted to a magnet
	F. Weakly attracted to a magnet
	G. Potassium tetrachloroplatinum(II)
	H. Potassium tetrachloroplatinate(II)
	I. Forms a stable ring structure
	J. Have weak ring structure

Answers

LIST A	6	7	8	9	10
LIST B	I	H	E	D	A

5/5

PART C: Write T if the statement is correct and F if the statement is incorrect (1 mark @)

11. A complex usually possesses one ligand only... F ...
12. Ti4+ has no d – electrons, so it is white, as it reflects all of the light that falls on it..... T
13. The magnetism of transition metal complexes can be affected by the ligands... T ...
14. Transition metals are good as catalysts as they are reluctant to accept or donate electrons... F
15. Like s – block elements, transition elements form alloys with one another..... T

4/5

PART D: Answer the following questions by writing in the space provided in each question (5 marks @):

16. With examples differentiate homogeneous catalysts from heterogeneous catalysts

Homogeneous catalysts are those catalysts which function in the same phase different phases Example Homogeneous Catalysts are those catalyst works in the same phase Example peroxide during production of Ammonia gas.

Heterogeneous catalysts are those catalysts which works in different phases Example V_2O_5 during production of sulphuric acid

$$SO_{2(g)} + V_2O_{5(s)} \rightarrow 2SO_{3(g)} + V_2O_4$$

2

2/5

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17. Explain what happens for the following catalytic reactions:

$SO_2(g) + 2V_2O_5(s) \longrightarrow SO_3(g) + V_2O_4$

$2V_2O_4 + 1/2O_2 \longrightarrow 2V_2O_5(s)$

$SO_2(g) + 1/2O_2 \longrightarrow SO_3(g)$

4/5 What happens to V_2O_5 at first?

At the first step $SO_2(g)$ has oxidized to SO_3 by the catalyst V_2O_5 at the second step the catalyst return to its original state by reaction with O_2. Here $V_2O_5(s)$ acts as the catalyst for the formation of $SO_3(g)$ and remain unchanged

18. What is the nature of the bonding in chlorides as the oxidation number increases?

5/5 As the oxidation number increases the size of the metal ion decreases which lead to polarization to take place as the result the bonding nature in chlorides changed to covalent bond instead of ionic bond at lower oxidation number

19. Name the complex $K[CrF_4O]$. Potassium tetra fluro oxide chromate(i) ✗

20. Differentiate screening effect from shielding effect

2/5 Screening effect is the process by which the inner electrons screen or prevent the nuclear charge to reach the outer electrons and make it to become loosely

Shielding effect is the process which happen when the inner electrons forces or push the outer electrons outside.

21. $Zn + Fe^{2+} \longrightarrow Zn^{2+} + Fe$. Identify which was (i) oxidized (ii) reduced in the reaction.

5/5 (i). Zn has oxidized to Zn^{2+}

(ii). Fe^{2+} has reduced to Fe

22. Compare the density of the transition metals with the s – block metals down the group.

5/5 The density of the transition metal down the group increases due to gradual increase in ~~the~~ a nuclear attractive charges and small increase in atomic radius due to Lathanide contraction unlike the S-blocks metal the density decreases down the group due to increase in atomic radius.

DEPARTMENT OF CHEMISTRY

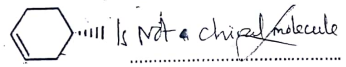
CH 214: ORGANIC CHEMISTRY II - QUIZ 1

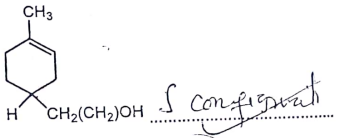
Name: KALINGA LAWI Reg. No. T/UPDM/2015/00835

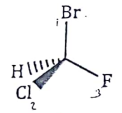
16/10

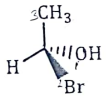
Q1: Using Fischer projection, draw all stereoisomers of $CH(CH_3)_2CH(Br)CH(Br)CH(CH_3)_2$

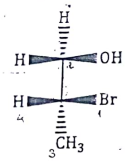
Q2: Assign the configurations (*R*/*S*) of the following compounds:

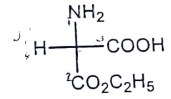
i.  Is NOT a chiral molecule

ii.  S configuration (1)

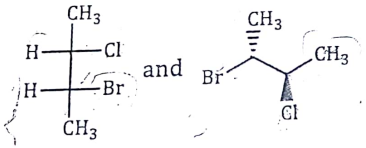
iii.  R configuration

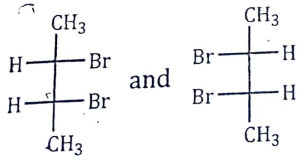
iv.  S configuration (1)

v.  2R configuration (1)

vi.  2R configuration (1)

Q3: What is the relationship between the following pairs of stereoisomers:

i.  The two compounds are Diastereoisomers (1)

ii.  The two compounds are meso compounds (1)