The Open University of Sri Lanka
CMF 2205 – 2015/2016
Assignment Test (CAT) II

Date: (Sunday) 20. 03. 2016 **Time: 9.30 am – 11.00 am**

Instruction to candidates

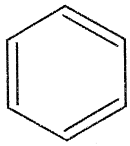
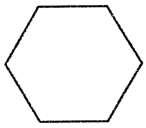
- **The paper consists of two parts, Part A (20 MCQ) and Part B (two structured essay).**
- **Choose the most correct answer for each MCQ question and mark a cross "X" over the answer on the answer sheet.**
- **Any answer with more than one cross will not be counted.**
- **Each correct answer will get 3 marks.**
- **0.5 marks will be deducted for each incorrect answer.**
- **The use of a non-programmable electronic calculator is permitted.**

Answer all questions. **Part A**

1. What is the empirical formula of an organic compound containing only 40% Carbon, 6.6% hydrogen and 53.3% Oxygen? (Atomic masses of C=12, H=1, O=16)
කාබන් 40%, හයිඩ්‍රජන් 6.6% සහ ඔක්සිජන් 53.3% යන මූලද්‍රව්‍යයන්ගෙන් පමණක් සමන්විත කාබනික සංයෝගයක අනුභාවික සූත්‍රය වනුයේ (පරමාණුක ස්කන්ධ C=12, H=1, O=16)

1) $C_4H_5O_3$ 2) CH_2O 3) $C_3H_6O_3$ 4) $C_4H_6O_3$ 5) $C_4H_6O_2$

2. Which compounds are aliphatic? ඇලිෆැටික සංයෝග/ය වනුයේ

a) C_2H_6 b)  c) 

1) a only 2) b only 3) c only 4) b and c only 5) a and c only

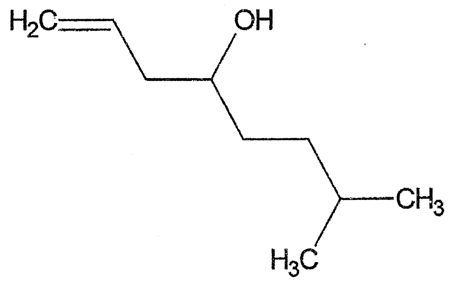
3. How many structural non cyclic isomers for C_5H_{12} (pentane) are possible?
පෙන්ටේන් අණුව සඳහා චක්‍රීය නොවන ව්‍යුහ සමාවයවික කීයක් තිබේ ද?

1) 2 2) 3 3) 1 4) 4 5) 0

4. Which of the following is **Not** true for the compounds, 1-propanol and 2-propanol?
1-ප්‍රොපනෝල් සහ 2-ප්‍රොපනෝල් අණු සම්බන්ධයෙන් අසත්‍ය ප්‍රකාශය වනුයේ

1) They are alcohols /මෙම අණු ඇල්කොහොල වේ.
2) They have similar chemical properties/මෙම අණුවල රසායනික ගුණ සමානය.
3) They are examples for positional isomers
මෙම අණු ස්ථාන සමාවයවික වලට උදාහරණ වේ.
4) Their physical properties are identical/මෙම අණුවල භෞතික ගුණ සර්වසම වේ.
5) They have three carbon atoms in the structure
මෙම අණුවල ව්‍යුහයන් කාබන් පරමාණු තුනකින් සමන්විතය.

5. What is the IUPAC name for the following molecule? පහත අණුවේ IUPAC නාමය වනුයේ



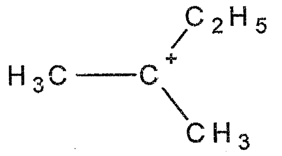
1) 7-methyl-1-octen-4-ol 2) 2-methyl-7-octen-5-ol 3) 7-methyl-2-octen-4-ol
4) 2-methyl-8-octen-5-ol 5) 7-methyl-1-octen-2-ol

6. For which of the compounds below are cis-trans isomers possible?
පහත අණුවලින් සිස්-ට්‍රාන්ස් සමාවයවිකතාව දක්වන්නේ

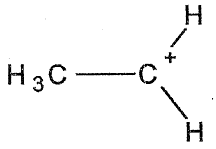
a) $CH_3CH{=}CH_2$ b) $CH_3CH{=}CHCH_2CH_3$ c) $CH_3CH{=}CHCH_3$

1) only a 2) both a and b 3) both b and c 4) all three compounds 5) only c

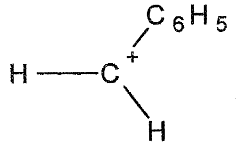
7. Which of the following structure/s is/are primary carbocations?
පහත ව්‍යුහ අතුරින් ප්‍රාථමික කාබොකැටායන/යක් වනුයේ



a)



b)



c)

1) a only 2) b only 3) c only 4) a and b only 5) b and c only

8. What is the H^+ concentration in mol dm^{-3} of a solution with a pH of 3.12?
pH = 3.12වන ද්‍රාවණයක H^+ සාන්ද්‍රණය mol dm^{-3} වනුයේ

1) 2.4×10^{-4} 2) 5.0×10^{-4} 3) 7.6×10^{-4} 4) 3.1×10^{-4} 5) 7.0×10^{-4}

9. 50 mL of a saturated solution of $PbCl_2$ was found to contain 0.2207g of $PbCl_2$ dissolved in it. What is the concentration in mol dm^{-3} of $PbCl_2$ in this solution?
(Molecular weight of $PbCl_2$ is 278.0)
සංතෘප්ත $PbCl_2$ ද්‍රාවණයක 50 mL ක , 0.2207g $PbCl_2$ අඩංගු වේ. මෙම ද්‍රාවණයේ $PbCl_2$ සාන්ද්‍රණය කුමක් ද? ($PbCl_2$ අණුක ස්කන්ධ =278.1 g/mol)

1) 0.012 2) 0.032 3) 0.150 4) 0.0159 5) 0.0146

10. What is the solubility constant expression for $Zn_3(PO_4)_2$?
$Zn_3(PO_4)_2$ හි ද්‍රාව්‍යතාගුණිතය K_{sp} සඳහා ප්‍රකාශනය වනුයේ

1) $Ksp = [Zn^{2+}][PO_4^{3-}]$ 2) $Ksp = [Zn^{2+}][2PO_4^{3-}]$ 3) $Ksp = [Zn^{2+}]^3[PO_4^{3-}]^2$

4) $Ksp = [3Zn^{2+}]^3[2PO_4^{3-}]^2$ 5) $Ksp = [Zn^{3+}]^2[PO_4^{2-}]^3$

11. Which statement is **not true** about acids and bases?
අම්ල හා භෂ්ම සඳහා අසත්‍ය ප්‍රකාශය වනුයේ

1) Acetic acid is a weak acid./ ඇසිටික් අම්ලය දුබල අම්ලයකි.
2) Strong acids dissociate completely in aqueous solutions.
ප්‍රබල අම්ල ජලීය ද්‍රාවණවලදී සම්පූර්ණයෙන්ම විඝටනය වේ.
3) The Group I hydroxides are strong bases. පළමු කාණ්ඩයේ හයිඩ්‍රොක්සයිඩ භෂ්ම වේ.
4) Polyprotic acids result more than one H^+ by dissociation.
බහුප්‍රෝටික අම්ල විඝටනය වීමේදී එක් H^+ අයනයකට වඩා ලබා දෙයි.
5) Weak acids dissociate completely in aqueous solutions.
දුබල අම්ල ජලීය ද්‍රාවණවලදී සම්පූර්ණයෙන්ම විඝටනය වේ.

12. Which of the following is/are immiscible with water?
ජලය සමඟ දිය නොවන ද්‍රාවණ/ය වනුයේ

a) Ethanol එතනෝල් b) Coconut Oil /පොල්තෙල් c) Methanol/මෙතනෝල්

1) a only 2) b only 3) Both a and b only 4) Both b and c only 5) All a, b and C

13. Which statement is **true** about Fractional Distillation?
භාගික ආසවනය සම්බන්ධයෙන් සත්‍ය ප්‍රකාශය වනුයේ

1) This method depends on the melting point of components in a mixture of liquids.
මෙම ක්‍රමය ද්‍රාවණ මිශ්‍රණයක ඇති සංයෝගවල ද්‍රවාංක මත පදනම් වේ.

2) Only separation of binary mixtures can be done.
මෙම ක්‍රමයෙන් වෙන්කල හැක්කේ ද්වයංගී සංයෝග මිශ්‍රණ පමණි.

3) The most volatile component remain in the mixture while the least volatile compound is collected at the receiver flask. මෙහිදී උපරිම වාෂ්පශීලී සංයෝගය මිශ්‍රණයේ ඉතිරිවන අතර අවම වාෂ්පශීලී සංයෝගය එකතු කරන ප්ලාස්කුවේ එකතු වේ.

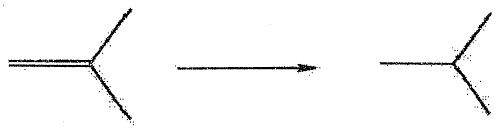
4) This cannot be used to separate an ideal solution into its pure components.
පරිපූර්ණ සංයෝගයක් එහි සංඝටනවලට වෙන් කිරීම සඳහා මෙම ක්‍රමය භාවිතා කල නොහැක.

5) The fractionating column of the distillation apparatus is packed with small beads to increase the surface area. /භාගික ආසවණයේ දී භාවිතා වන කුළුණ කුඩා පබළු වැනි ද්‍රව්‍යයකින් පුරවා ඇත්තේ වර්ගඵලය වැඩිකර ගැනීම සඳහා ය.

14. 100.00 mL of 0.2 mol dm^{-3} NaOH neutralized 20.00 mL of HCl acid. Determine the concentration in mol dm^{-3} of the acid.
0.2 mol dm^{-3} NaOH ද්‍රාවණයක මිලිලීටර 100.00 ක් HCl ඇසිඩ් ද්‍රාවණයක මිලිලීටර 20.00 කින් උදාසීන විය. ඇසිඩ් ද්‍රාවණයේ සාන්ද්‍රණය ගණනය කරන්න

1) 1.0 2) 0.1 3) 2.0 4) 3.2 5) 0.01

15. Which of the following reagent/s is/are needed to complete the following reaction?
පහත ප්‍රතික්‍රියක අතුරෙන් මෙම ප්‍රතික්‍රියාව සඳහා අවශ්‍ය වනුයේ



1) H_2,/ Pd (palladium catalyst) 2) $FeCl_2$ 3) H_2SO_4 4) H_2,/ SO_2 5) H_2

16. The molecular formula of water is H_2O. Which statement is not true about H_2O?
ජලයේ අණුක සූත්‍රය H_2O වේ. H_2O සඳහා අසත්‍ය වගන්තිය වනුයේ

1) One mole of H_2O has one mole of O atoms.
ජල අණු මවුලයක ඔක්සිජන් පරමාණු මවුලයක් ඇත.
2) One mole of H_2O has two moles of H atoms.
ජල අණු මවුලයක හයිඩ්‍රජන් පරමාණු මවුල දෙකක් ඇත.
3) One mole of H_2O has an Avogadro number of H atoms.
ජල අණු මවුලයක හයිඩ්‍රජන් පරමාණු ඇවගාඩ්රෝ සංඛ්‍යාවක් ඇත.
4) One mole of H_2O has an Avogadro number × 3 times of atoms.
ජල අණු මවුලයක ඇවගාඩ්රෝ සංඛ්‍යාව මෙන් තුන් ගුණයක පරමාණු ඇත.
5) One molecule of H_2O has three atoms./ජල අණුවක පරමාණු තුනක් ඇත.

17. Find the correct formula for Iron (III) phosphate?
අයන් (III) පොස්පේට් සඳහා නිවැරදි සූත්‍රය වනුයේ

1) $Fe_3(PO_4)_2$ 2) $FePO_4$ 3) $FePO_3$ 4) $Fe_2(PO_3)$ 5) $FEPO_4$

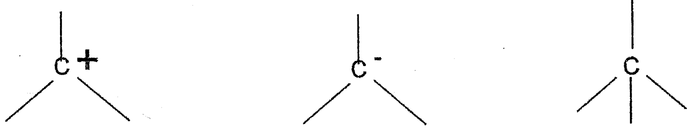
18. Which of the following reaction is an example for an oxidation-reduction reaction? පහත ප්‍රතික්‍රියා අතරින් ඔක්සිකරණ - ඔක්සිහරණ ප්‍රතික්‍රියාවක් සඳහා උදාහරණයක් වන්නේ

1) $Cr_2O_7^{2-} + 14H^+ \longrightarrow 2Cr^{3+} + 7H_2O$
2) $CaCO_3 \longrightarrow CaO + CO_2$
3) $N_2O_4 \longrightarrow 2NO_2$
4) $NaOH + HCl \longrightarrow NaCl + H_2O$
5) $CO_2 + H_2O \longrightarrow H_2CO_3$

19. Which solution can be used to identify an alkene in the laboratory?
ඇල්කීනයක් හඳුනා ගැනීම සඳහා පරීක්ෂණාගාරයේ දී භාවිතා කල හැකි ද්‍රාවණය වනුයේ

1) H_2SO_4 2) $NaNH_2$ 3) $KMnO_4$ 4) $AgNO_3$ 5) CuCl

20. Which molecule represents a carbocation?
කාබොකැටායනයක් දැක්වෙන්නේ කුමන අණුවේ ද?



(a) (b) (c)

1) a 2) b 3) Both a and b 4) Both b and c 5) Both a and c

Registration No [| | | | | | | | |]

Part B

1. a) Potassium dichromate (VI), $K_2Cr_2O_7$ reacts with sodium ethanedioate , $Na_2C_2O_4$. The following ionic conversions happen in the reaction.
පොටෑසියම් ඩයික්‍රෝමේට් (VI), $K_2Cr_2O_7$ සෝඩියම් එතනොයේට්, $Na_2C_2O_4$. සමඟ ප්‍රතික්‍රියා කරයි. මේ ප්‍රතික්‍රියාව සඳහා අයනික සමීකරණ පහත දැක්වේ.

$$Cr_2O_7^{2-} \longrightarrow Cr^{3+}$$
$$C_2O_4^{2-} \longrightarrow CO_2$$

i) Balance the two half equations. මෙම අර්ධ අයනික සමීකරණ තුලිත කරන්න.

ii) Identify the oxidation and reduction reactions.
ඔක්සිකරණ සහ ඔක්සිහරණ ප්‍රතික්‍රියා හඳුනාගන්න.

iii) Write down the balanced chemical equation for the above reaction.
මෙම ප්‍රතික්‍රියාව සඳහා තුලිත සමීකරණය දෙන්න.

b) Aluminium reacts with air forming Aluminium oxide.
ඇලුමිනියම් ජලය සමඟ ප්‍රතික්‍රියා කර ඇලුමිනියම් ඔක්සයිඩ් සාදයි.

i) Give the balanced equation for this reaction.
මෙම ප්‍රතික්‍රියාව සඳහා තුළිත සමීකරණය දෙන්න.

ii) How many grams of Aluminium oxide are formed when 1.00 g of Aluminium was reacted in excess air? (Atomic masses of Al=27, O=16)
ඇලුමිනියම් 1.00 g ක් අතිරික්ත වායු සමඟ ප්‍රතික්‍රියා කිරීමේ දී සෑදෙන ඇලුමිනියම් ඔක්සයිඩ ස්කන්ධය ගණනය කරන්න.(පරමාණුක ස්කන්ධ Al=27, O=16)

iii) What is the limiting reagent in this reaction? /මෙහි සීමාකාරී ද්‍රව්‍යය වන්නේ කුමක් ද?

c) You are given three acid , X, Y and Z to prepare a buffer solution of pH 4.4. The pKa values of the acids are 7.5, 2.3 and 4.7 respectively.
ඔබට X, Y සහ Z නම් ආම්ලික ද්‍රාවණ 3 ක් සපයා ඇත. මේවායේ pKa අගයන් පිළිවෙලින් 7.5, 2.3 සහ 4.7 වන අතර pH 4.4. වන ස්වාරක්ෂක ද්‍රාවණයක් සෑදිය යුතුය.

i) Which acid would you choose to make the buffer at pH 4.4? Explain.
pH 4.4 වන ස්වාරක්ෂක ද්‍රාවණය සෑදීමට ඔබ භාවිතා කරන අම්ලය කුමක් ද? පැහැදිලි කරන්න.

ii) Calculate the ratio of $\log_{10}[A^-]/[HA]$ in the buffer solution.
මෙම ස්වාරක්ෂක ද්‍රාවණයේ $\log_{10}[A^-]/[HA]$ අනුපාතය ගණනය කරන්න.

02. a) 20 g of but-1-ene, C_4H_8, was treated with an excess of liquid bromine.

බියුට්-1-ඊන් 20 g ක් අතිරික්ත ද්‍රව බ්‍රෝමීන් සමඟ ප්‍රතික්‍රියා කරන ලදී.

i) Write an equation showing the structures of reactants and product.
ප්‍රතික්‍රියක හා ප්‍රතිඵල ව්‍යුහ දැක්වෙන සමීකරණයක් ලියන්න.

ii) Give the name of the product. ප්‍රතිඵලයෙහි නම දෙන්න.

iii) Draw the structures of possible non-cyclic isomers of C_4H_8.
C_4H_8 සඳහා චක්‍රීය නොවන සමාවයවිකවල ව්‍යුහ අඳින්න.

iv) Draw the mechanism for the reaction of C_4H_8 with bromine.
C_4H_8 සහ බ්‍රෝමීන් අතර ප්‍රතික්‍රියාවේ යාන්ත්‍රණය දෙන්න.

b) Bute-1-yne is a terminal alkyne. බියුට්-1- අයින් ආන්තික ඇල්කයිනයකි.

i) Draw the structure of bute1-yne and give the type of hybridization at each Carbon atom. බියුට්-1-අයින් අණුවේ ව්‍යුහය ඇඳ එක් එක් කාබන් පරමාණුවේ මුහුම්කරණය දක්වන්න.

ii) What reagents would you use to identify but-1-yne from but-2-ene? What would you observe?
බියුට්-1- අයින් සහ බියුට්-2-අයින් වෙන්කර හඳුනා ගැනීමට ඔබ භාවිතා කරන ද්‍රාවණ මොනවා ද? ඔබේ නිරීක්ෂණය කුමක් ද?

iii) The chlorination of ethane can be represented as follows;
එතේන් ක්ලෝරිනීකරණය පහත පරිදි වේ.

$$CH_4 + Cl_2 \xrightarrow{\text{Light}} CH_3Cl + HCl$$

This reaction takes place via different steps. Give the possible reactions at each step of the mechanism.
මෙම රසායනික ප්‍රතික්‍රියාව විවිධ පියවර යටතේ සිදුවේ. මෙම පියවරවලදී සිදුවන රසායනික ප්‍රතික්‍රියා දෙන්න.

a. Initiation ආරම්භය
b. Propagation ප්‍රචාරණය
c. Termination අවසානය

The Open University of Sri Lanka Name :- ....

CMF 2205 – Chemistry I -2015/ 2016

Assignment Test II Registration No.

This question paper consists of 2 **PARTS A & B**.
PART A carries 20 multiple choice questions
PART B carries **two** structured type questions.
ANSWER ALL QUESTIONS

INSTRUCTIONS:

Each item is a statement or question that may be answered by one of the five responses given. There is only **one best** answer to every question. Mark a cross **(X)** over the most suitable answer. For each correct response, **03** marks will be awarded. For each incorrect response, **0.5** marks will be deducted.

1.	1	2	3	4	5
2.	1	2	3	4	5
3.	1	2	3	4	5
4.	1	2	3	4	5
5.	1	2	3	4	5
6.	1	2	3	4	5
7.	1	2	3	4	5
8.	1	2	3	4	5
9.	1	2	3	4	5
10.	1	2	3	4	5
11.	1	2	3	4	5
12.	1	2	3	4	5
13.	1	2	3	4	5
14.	1	2	3	4	5
15.	1	2	3	4	5
16.	1	2	3	4	5
17.	1	2	3	4	5
18.	1	2	3	4	5
19.	1	2	3	4	5
20.	1	2	3	4	5

Unattempte Questions		Correct Answers		Wrong Answers		Marks	

The Open University of Sri Lanka
CMF 2205 – 2015/2016
Assignment Test (CAT) II

Date: (Sunday) 20. 03. 2016 **Time: 9.30 am – 11.00 am**

Instruction to candidates
பரீட்சார்த்திகளுக்கான அறிவுறுத்தல்கள்

- **The paper consists of two parts, Part A (20 MCQ) and Part B (two structured essay).**
  வினாத்தாள் இரு பகுதிகளை கொண்டது . பகுதி A (20 ப.தே.வி) மற்றும் பகுதி B (இரு அமைப்புக்கட்டுரைகள்)
- **Choose the most correct answer for each MCQ question and mark a cross "X" over the answer on the answer sheet.**
  ப.தே.வி வினாக்களிற்கு மிகச்சரியான விடையை தேர்ந்து விடைத்தாளில் விடையின் மேல் புள்ளடி "X" அடையாளமிடுக
- **Any answer with more than one cross will not be counted.**
  விடையொன்றிற்கு ஒன்றிற்கு மேற்பட்ட புள்ளடி இடப்படின் கருத்திற்கொள்ளப்படாது
- **Each correct answer will get 3 marks.**
  ஒவ்வொரு சரியான விடைக்கும் 3 புள்ளிகள் வழங்கப்படும்
- **0.5 marks will be deducted for each incorrect answer.**
  ஒவ்வொரு தவறான விடைக்கும் 0.5 புள்ளிகள் கழிக்கப்படும்.
- **The use of a non-programmable electronic calculator is permitted.** நெறிப்படுத்தப்படாத கணிணி பாவனை அனுமதிக்கப்பட்டுள்ளது

Answer all questions
அனைத்து வினாக்களிற்கும் விடையளிக்குக

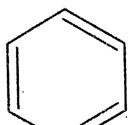
Part A
பகுதி A

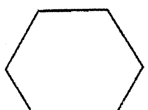
1. What is the empirical formula of an organic compound containing only 40% Carbon, 6.6% hydrogen and 53.3% Oxygen? (Atomic masses of C=12, H=1, O=16)
   40% காபன், 6.6% ஐதரசன் மற்றும் 53.3% ஒட்சிசன் என்பவற்றை மட்டுமே கொண்ட சேதனச் சேர்வையின் அனுபவச்சூத்திரம் யாது? (அணுத்திணிவு C=12, H=1, O=16)

   1) $C_4H_5O_3$ 2) CH_2O 3) $C_3H_6O_3$ 4) $C_4H_6O_3$ 5) $C_4H_6O_2$

2. Which compounds are aliphatic?
   பின்வருவனவற்றுள் அலிபாற்றிக் சேர்வைகள் யாவை?

   a) C_2H_6

   b)
   

   c)
   

   1) a only 2) b only 3) c only 4) b and c only 5) a and c only

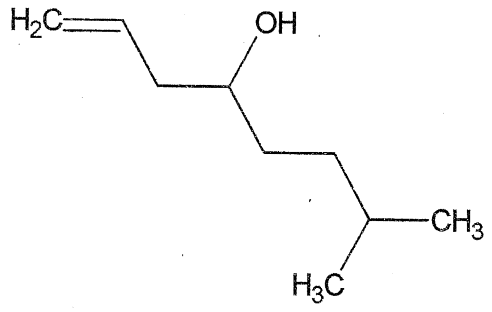
3. How many structural non cyclic isomers for C_5H_{12} (pentane) are possible?
C_5H_{12} (pentane) ன் கட்டமைப்பிற்கான சக்கரமற்ற சமவுருக்கள் எத்தனை காணப்படும்?

1) 2 2) 3 3) 1 4) 4 5) 0

4. Which of the following is **Not** true for the compounds, 1-propanol and 2-propanol?
பின்வருவனவற்றுள் 1-propanol and 2-propanol சேர்வை பற்றிய சரியற்ற கூற்று யாது?

1) They are alcohols
இவை அற்ககோல்களாகும்
2) They have similar chemical properties
ஒரே மாதிரியான இரசாயன இயல்புகள் உடையவை
3) They are examples for positional isomers
இவை நிலையான சமவுருக்களிற்கான உதாரணமாகும்
4) Their physical properties are identical
ஒரே மாதிரியான பௌதீக இயல்புகள் உடையவை
5) They have three carbon atoms in the structure
இவற்றின் கட்டமைப்பில் மூன்று காபன் அணுக்கள் காணப்படும்

5. What is the IUPAC name for the following molecule?
இம்மூலக்கூறின் IUPAC பெயர் யாது?



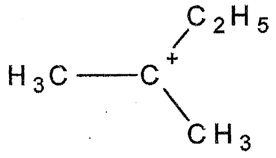
1) 7-methyl-1-octen-4-ol
2) 2-methyl-7-octen-5-ol
3) 7-methyl-2-octen-4-ol
4) 2-methyl-8-octen-5-ol
5) 7-methyl-1-octen-2-ol

6. For which of the compounds below are cis-trans isomers possible?
பின்வரும் சேர்வைகளில் எவற்றில் cis-trans சமவுருக்களை பெறுவது சாதகமானதாகும்?

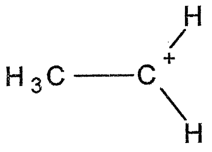
a) $CH_3CH{=}CH_2$ b) $CH_3CH{=}CHCH_2CH_3$ c) $CH_3CH{=}CHCH_3$

1) only a 2) both a and b 3) both b and c 4) all three compounds 5) only c

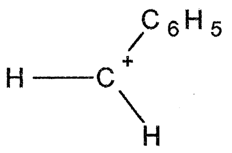
7. Which of the following structure/s is/are primary carbocations?
பின்வருவனற்றுள் முதன்மை காபோ கற்றயனை கொண்ட கட்டமைப்பு/கட்டமைப்புக்கள் யாது/யாவை?



a)



b)



c)

1) a only 2) b only 3) c only 4) a and b only 5) b and c only

8. What is the H^+ concentration in mol dm^{-3} of a solution with a pH of 3.12?
pH = 3.12 எனும் கரைசலினது H^+ செறிவு mol dm^{-3}ல் யாது?

1) 2.4×10^{-4} 2) 5.0×10^{-4} 3) 7.6×10^{-4} 4) 3.1×10^{-4} 5) 7.0×10^{-4}

9. 50 mL of a saturated solution of $PbCl_2$ was found to contain 0.2207g of $PbCl_2$ dissolved in it. What is the concentration in mol dm^{-3} of $PbCl_2$ in this solution?
(Molecular weight of $PbCl_2$ is 278.0)
50 mL $PbCl_2$ நிரம்பற்கரைசலானது அதனுள் 0.2207g $PbCl_2$ கரைக்கப்பட்டு இருப்பதாக அறியப்பட்டது எனின், $PbCl_2$ கரைசலினது செறிவை mol dm^{-3} தருக?
($PbCl_2$ இன் மூலக்கூற்று திணிவு = 278.0)

1) 0.012 2) 0.032 3) 0.150 4) 0.0159 5) 0.0146

10. What is the solubility constant expression for $Zn_3(PO_4)_2$?
$Zn_3(PO_4)_2$ இனது கரைதிறன் மாறிலிக்கான கோவை யாது?

1) $Ksp = [Zn^{2+}][PO_4^{3-}]$ 2) $Ksp = [Zn^{2+}][2PO_4^{3-}]$ 3) $Ksp = [Zn^{2+}]^3[PO_4^{3-}]^2$

4) $Ksp = [3Zn^{2+}]^3[2PO_4^{3-}]^2$ 5) $Ksp = [Zn^{3+}]^2[PO_4^{2-}]^3$

11. Which statement is **not true** about acids and bases?
பின்வருவனற்றுள் அமிலம் மற்றும் காரம் பற்றிய சரியற்ற கூற்று யாது?
1) Acetic acid is a weak acid.
அசற்றிக்கமிலம் ஒரு மென்னமிலமாகும்
2) Strong acids dissociate completely in aqueous solutions.
வன்னமிலங்கள் நீர்க்கரைசலில் முற்றாக பிரிகையடையும்
3) The Group I hydroxides are strong bases.
கூட்டம் I ஐதரொட்சைட்டுக்கள் வன்காரமாகும்
4) Polyprotic acids result more than one H^+ by dissociation
பொலிபுரோட்டிக் அமிலங்கள் ஒன்றிற்கு மேற்பட்ட H^+ பிரிகைகளை விளைவிக்கும்
5) Weak acids dissociate completely in aqueous solutions.
மென்னமிலங்கள் நீர்க்கரைசலில் முற்றாக பிரிகையடையும்

12. Which of the following is/are immiscible with water?
பின்வருவனற்றுள் நீருடன் கலவாத பதார்த்தம்/பதார்த்தங்கள் யாது/யாவை?

a) Ethanol எதனோல் b) Coconut Oil தேங்காய் எண்ணெய் c) Methanol மெதனோல்

1) a only 2) b only 3) Both a and b only 4) Both b and c only 5) All a, b and C

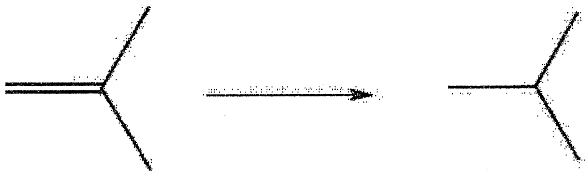
13. Which statement is **true** about Fractional Distillation?
பகுதியாக பிரித்தெடுத்தல் பற்றிய சரியான கூற்று யாது?

1) This method depends on the melting point of components in a mixture of liquids.
இம்முறையானது அக்கரைசலினுள் கலந்துள்ள சேர்வைகளின் உருகுநிலையிலேயே தங்கியுள்ளது.
2) Only separation of binary mixtures can be done.
இரு சேர்வைகளின் கலவையை மாத்திரமே பிரித்தெடுக்கமுடியும்
3) The most volatile component remain in the mixture while the least volatile compound is collected at the receiver flask.
ஆவிப்பறப்புக்கூடிய கூறுகள் கலவையினுள் மீதமிருக்க, ஆவிப்பறப்புக்குறைந்த கூறுகள் சேகரிப்புக்குடுவையினுள் சேகரிக்கப்படும்
3) This cannot be used to separate an ideal solution into its pure components.
இலட்சியக் கரைசலை அதனுடைய தூய கூறுகளாக பிரித்தெடுக்க இம்முறையானது பயன்படாது
5) The fractionating column of the distillation apparatus is packed with small beads to increase the surface area.
வடித்தெடுப்பு உபகரணத்தில் பிரித்தெடுப்பு நிரலானது சிறுமணிகள் கொண்டு நிரப்பப்படுவது மேற்பரப்பை அதிகரிப்பதற்காகும்

14. 100.00 mL of 0.2 mol dm^{-3} NaOH neutralized 20.00 mL of HCl acid. Determine the concentration in mol dm^{-3} of the acid.
100.00 mL ,0.2 mol dm^{-3} NaOH ஆனது 20.00 mL HCl அமிலத்தை நடுநிலைப்படுத்துகின்றது எனின் அமிலத்தினது செறிவை mol dm^{-3} தருக.

1) 1.0 2) 0.1 3) 2.0 4) 3.2 5) 0.01

15. Which of the following reagent/s is/are needed to complete the following reaction?
பின்வரும் தாக்கத்தை பூர்த்தி செய்வதற்கு தேவையான சோதனை காரணிகள் யாது/யாவை?



1) H_2,/ Pd (palladium catalyst) 2) $FeCl_2$ 3) H_2SO_4 4) H_2,/ SO_2 5) H_2

16. The molecular formula of water is H_2O. Which statement is not true about H_2O?
நீரினது மூலக்கூற்றுச்சூத்திரம் H_2O ஆகும். பின்வருவனவற்றுள் H_2O பற்றிய சரியற்ற கூற்று யாது?

1) One mole of H_2O has one mole of O atoms.
ஒரு மூல் H_2O ஆனது ஒரு மூல் O அணுவைக் கொண்டது
2) One mole of H_2O has two moles of H atoms.
ஒரு மூல் H_2O ஆனது இரு மூல் H அணுக்களைக் கொண்டது
3) One mole of H_2O has an Avogadro number of H atoms.
ஒரு மூல் H_2O ஆனது அவகாதரோ எண்ணிக்கையான H அணுக்களை கொண்டது
4) One mole of H_2O has an Avogadro number × 3 times of atoms.
ஒரு மூல் H_2O ஆனது அவகாதரோ எண்ணிக்கை × 3 மடங்கான அணுக்களை கொண்டது
5) One molecule of H_2O has three atoms.
ஒரு மூலக்கூறு H_2O இல் மூன்று அணுக்கள் காணப்படும்

17. Find the correct formula for Iron(III)phosphate?
Iron(III)phosphate இன் சரியான சூத்திரம் யாது?

1) $Fe_3(PO_4)_2$ 2) $FePO_4$ 3) $FePO_3$ 4) $Fe_2(PO_3)$ 5) $FEPO_4$

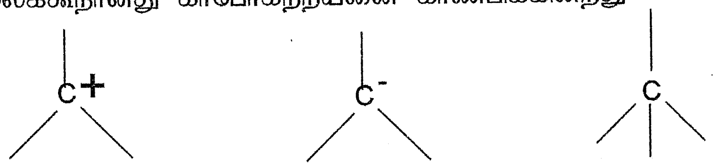
18. Which of the following reaction is an example for an oxidation-reduction reaction?
பின்வரும் தாக்கங்களில் ஒட்சியேற்றல்-தாழ்த்தல் தாக்கத்திற்கு உதாரணமானது யாது?

1) $Cr_2O_7^{2-} + 14H^+ \longrightarrow 2Cr^{3+} + 7H_2O$
2) $CaCO_3 \longrightarrow CaO + CO_2$
3) $N_2O_4 \longrightarrow 2NO_2$
4) $NaOH + HCl \longrightarrow NaCl + H_2O$
5) $CO_2 + H_2O \longrightarrow H_2CO_3$

19. Which solution can be used to identify an alkene in the laboratory?
ஆய்வுகூடத்தில் அற்கீனை அடையாளம் காண்பதற்கு பயன்படுத்தப்படும் கரைசல் யாது?

1) H_2SO_4 2) $NaNH_2$ 3) $KMnO_4$ 4) $AgNO_3$ 5) CuCl

20. Which molecule represents a carbocation?
எம்மூலக்கூறானது காபோகற்றயனை காண்பிக்கின்றது



(a) (b) (c)

1) a 2) b 3) Both a and b 4) Both b and c 5) Both a and c

Registration No

Part B

1. a) Potassium dichromate (VI), $K_2Cr_2O_7$ reacts with sodium ethanedioate, $Na_2C_2O_4$. The following ionic conversions happen in the reaction.
பொட்டாசியம் இருகுரோமேற்று(VI), $K_2Cr_2O_7$ ஆனது சோடியம் எதேன்டையோயேற் $Na_2C_2O_4$ உடன் தாக்கமுறும். தாக்கத்தின் பொழுது பின்வரும் அயன்மாற்றம் நிகழ்கின்றது.

$$Cr_2O_7^{2-} \longrightarrow Cr^{3+}$$
$$C_2O_4^{2-} \longrightarrow CO_2$$

i) Balance the two half equations.
தரப்பட்ட இரு அரைச்சமன்பாடுகளையும் சமப்படுத்துக.

ii) Identify the oxidation and reduction reactions.
ஓட்சியேற்றல் மற்றும் தாழ்த்தல் தாக்கங்களை அடையாளம் காண்க

iii) Write down the balanced chemical equation for the above reaction.
மேற்தரப்பட்ட தாக்கத்திற்கான சமப்படுத்தப்பட்ட இரசாயன சமன்பாட்டை எழுதுக.

b) Aluminium reacts with air forming Aluminium oxide.
அலுமினியமானது வளியுடன் தாக்கமடைந்து அலுமினியம் ஒட்சைட்டை தோற்றுவிக்கின்றது.

i) Give the balanced equation for this reaction.
இத்தாக்கத்திற்கான சமப்படுத்தப்பட்ட சமன்பாட்டை தருக.

ii) How many grams of Aluminium oxide are formed when 1.00 g of Aluminium was reacted in excess air? (Atomic masses of Al=27, O=16)
1.00g அலுமினியமானது மிகையளவு வளியுடன் தாக்கத்திற்குட்படின் தோற்றுவிக்கும் அலுமினியம் ஒட்சைட்டை கிராமில் தருக.

iii) What is the limiting reagent in this reaction?
இத்தாக்கத்தினை கட்டுப்படுத்தும் காரணி யாது?

c) You are given three acid , X, Y and Z to prepare a buffer solution of pH 4.4. The pKa values of the acids are 7.5, 2.3 and 4.7 respectively.
pH 4.4 உடைய தாங்கல் கரைசலை தயாரிப்பதற்காக உமக்கு வழங்கப்பட்ட மூன்று அமிலங்கள் X, Y மற்றும் Z ஆகும். அவற்றின் pKa பெறுமானங்கள் முறையே 7.5, 2.3 மற்றும் 4.7 ஆகும்.

i) Which acid would you choose to make the buffer at pH 4.4? Explain.
pH 4.4 உடைய தாங்கல் கரைசலை தயாரிப்பதற்காக நீர் எவ்வமிலத்தை தேர்ந்தெடுப்பீர்? விளக்குக.

ii) Calculate the ratio of log $_{10}[A^-]/[HA]$ in the buffer solution.
தாங்கல் கரைசலின் log $_{10}[A^-]/[HA]$ விகிதத்தை கணிக்குக.

2. a) 20 g of but-1-ene, C_4H_8, was treated with an excess of liquid bromine.
20 g but-1-ene (C_4H_8) ஆனது மிகையான திரவ புரோமினுடன் தாக்கமடையப்பட்டது.

i) Write an equation showing the structures of reactants and product.
தாக்கிகள் மற்றும் விளைவுகளின் கட்டமைப்புக்களை கொண்டு சமன்பாட்டை தருக?

ii) Give the name of the product.
விளைவினது பெயரை தருக?

iii) Draw the structures of possible non-cyclic isomers of C_4H_8.
C_4H_8 இனால் காண்பிக்கப்படக்கூடிய பொருத்தமான சக்கரமற்ற சமவுருக்களை வரைக

iv) Draw the mechanism for the reaction of C_4H_8 with bromine.
C_4H_8 இற்கும் புரோமினிற்கும் இடையிலான தாக்கத்தின் பொறிமுறையை வரைக.

b) Bute-1-yne is a terminal alkyne.
Bute-1-yne ஆனது முனையத்திலுள்ள அல்கைன் ஆகும்

i) Draw the structure of bute-1-yne and give the type of hybridization at each Carbon atom.
Bute-1-yne கட்டமைப்பை வரைந்து அதன் ஒவ்வொரு காபனினதும் கலப்பு வகையை தருக

ii) What reagents would you use to identify but-1-yne from bute-2-ene? What would you observe?

bute-1-yne ஐ bute-2-ene இலிருந்து வேறுபடுத்தி அறிவதற்கு எச்சோதனைக் காரணிகளை பயன்படுத்துவீர்? உமது அவதானம் யாதென விளக்குக.

iii) The chlorination of ethane can be represented as follows;

எதேனினது குளோரினேற்றமானது பின்வருமாறு தரப்படும்

$$CH_4 + Cl_2 \xrightarrow{\text{Light}} CH_3Cl + HCl$$

This reaction takes place via different steps. Give the possible reactions at each step of the mechanism.

இத்தாக்கமானது பல படிமுறைகளில் நிகழும். ஒவ்வொரு பொறிமுறை படிகளிலும் நிகழும் சாதகமான தாக்கங்களை தருக

a. Initiation
   ஆரம்ப படி
b. Propagation
   பரவல் படி
c. termination
   முடிவு படி

The Open University of Sri Lanka
CMF 2205 – Chemistry I -2015/ 2016
Assignment Test II

Name :- ....

Registration No. | | | | | | | | | | |

This question paper consists of 2 **PARTS A & B**.
PART A carries 20 multiple choice questions
PART B carries **two** structured type questions.
வினாத்தாள் இரு பகுதிகளை கொண்டது .
பகுதி A 20 ப.தே.வி
பகுதி B இரு அமைப்புக்கட்டுரைகள்

ANSWER ALL QUESTIONS

INSTRUCTIONS:

Each item is a statement or question that may be answered by one of the five responses given. There is only **one best** answer to every question. Mark a cross **(X)** over the most suitable answer. For each correct response, **03** marks will be awarded. For each incorrect response, **0.5** marks will be deducted.

ப.தே.வி வினாக்களிற்கு மிகச்சரியான விடையை தேர்ந்து விடைத்தாளில் விடையின் மேல் புள்ளடி "X" அடையாளமிடுக . ஒவ்வொரு சரியான விடைக்கும் 3 புள்ளிகள் வழங்கப்படும், ஒவ்வொரு தவறான விடைக்கும் 0.5 புள்ளிகள் கழிக்கப்படும்.

1.	1	2	3	4	5
2.	1	2	3	4	5
3.	1	2	3	4	5
4.	1	2	3	4	5
5.	1	2	3	4	5
6.	1	2	3	4	5
7.	1	2	3	4	5
8.	1	2	3	4	5
9.	1	2	3	4	5
10.	1	2	3	4	5
11.	1	2	3	4	5
12.	1	2	3	4	5
13.	1	2	3	4	5
14.	1	2	3	4	5
15.	1	2	3	4	5
16.	1	2	3	4	5
17.	1	2	3	4	5
18.	1	2	3	4	5
19.	1	2	3	4	5
20.	1	2	3	4	5

Unattempte Questions		Correct Answers		Wrong Answers		Marks	