AGA KHAN UNIVERSITY EXAMINATION BOARD

HIGHER SECONDARY SCHOOL CERTIFICATE

CLASS XII

ALTERNATE TO PRACTICAL (ATP)

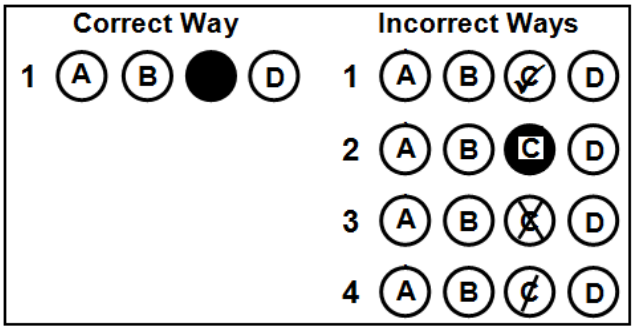
MODEL EXAMINATION PAPER 2021

Chemistry Paper III

Time: 25 minutes Marks: 15

INSTRUCTIONS

1. Read each question carefully.
2. Answer the questions on the separate answer sheet provided. DO NOT write your answers on the question paper.
3. There are 100 answer numbers on the answer sheet. Use answer numbers 1 to 15 only.
4. In each question, there are four choices A, B, C, D. Choose ONE. On the answer grid, black out the circle for your choice with a pencil as shown below.



Candidate's Signature

5. If you want to change your answer, ERASE the first answer completely with a rubber, before blacking out a new circle.
6. DO NOT write anything in the answer grid. The computer only records what is in the circles.
7. You may use a scientific calculator if you wish.

1. A student adds dilute HCl to a salt solution and observes no precipitate. She then passes H_2S gas through the same solution and observes black precipitate. This indicates the presence of

   A. Cu^{+2}
   B. Fe^{+2}
   C. Zn^{+2}
   D. Mg^{+2}

2. The given basic radicals form low solubility sulphides. These radicals precipitate when H_2S gas is passed through the original salt solution.

   - Mn^{2+}
   - Cu^{2+}
   - Zn^{2+}
   - Ni^{2+}

   Which ion(s) is/ are detected as sulphides in groups II and IV of basic radicals?

	Group II	**Group IV**
A	Cu^{2+}	Mn^{2+}, Zn^{2+} and Ni^{2+}
B	Mn^{2+} and Zn^{2+}	Cu^{2+} and Ni^{2+}
C	Cu^{2+} and Zn^{2+}	Mn^{2+} and Ni^{2+}
D	Mn^{2+}, Cu^{2+} and Ni^{2+}	Zn^{2+}

3. A white salt gives the following results when subjected to dry and wet tests.

	Test	**Observation**
Dry Test	Flame test	No characteristic colour
	Heating in a dry test tube	Sublimation with characteristic smell
Wet Test	Salt solution + NaOH and heat	White dense fumes when a glass rod dipped in concentrated HCl is added to it.
	Salt solution + NaOH and Nessler's reagent	A brown precipitate is formed.

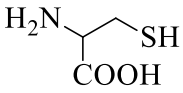
The given tests and their observations confirm the presence of

A. K^{+}
B. Ca^{2+}
C. Mg^{2+}
D. NH_4^{+}

4. The oxidation state of Cu in $[Cu(NH_3)_4]SO_4$ is

   A. 0
   B. +1
   C. +2
   D. +4

5. Consider the following organic compound.



   The reagent(s) that will give positive result when added to the Lassaigne's solution of the given compound is/ are

   A. $FeSO_{4(s)}$ + $NaOH_{(aq)}$ + dilute H_2SO_4
   B. CH_3COOH + $(CH_3COO)_2Pb$
   C. $Na_2[Fe(CN)_5.NO]$
   D. $FeCl_3$

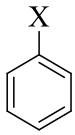
6. A student was given an unknown sample of cyclic sulphide to detect elements present in it. She had performed four tests on the sodium extract of the given compound, out of which, two had shown positive results.

S.No	Test	Sodium Extract of Cyclic Sulphide
I	$FeSO_{4(s)}$ + $NaOH_{(aq)}$ + dilute H_2SO_4	
II	CH_3COOH + $(CH_3COO)_2Pb$	
III	$Na_2[Fe(CN)_5.NO]$	
IV	$FeCl_3$	

   Which of the given tests would have shown positive results?

   A. I and II
   B. I and IV
   C. II and III
   D. III and IV

7. Consider the given table.

Structure of an Aromatic Compound	General Characteristics
	It has an odour like a rotten fish.
	It is used in the making of dyes and pigments.

On the basis of the given information, the functional group **X** is identified as

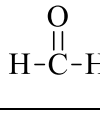
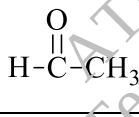
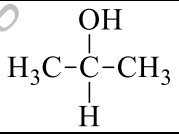
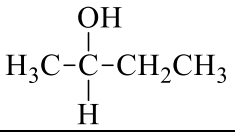
A. $-COOCH_3$
B. $-COOH$
C. $-OH$
D. $-NH_2$

8. $R\text{-}NH_2$ is the general structure of an amine.

The given structure will form stable diazonium salt at 0°C when **R** is

A. methyl.
B. butyl.
C. ethyl.
D. aryl.

9. All of the following compounds give positive result of iodoform test EXCEPT

			
A	B	C	D

10. A colourless and viscous liquid phenol shows the following observations when subjected to the given tests.

Tests	Observations
Ferric chloride test	Violet colour
Phthalein test	Blue purple colour

It can be inferred from the given observations that the phenol is

A. o-Cresol.
B. m-Cresol.
C. α-Naphthol.
D. β-Naphthol.

11. The given equation shows the oxidation process.

X ⟶ Aldehydes ⟶ **Y**

X and **Y** are identified as

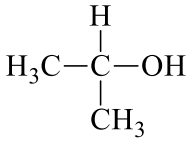
	X	**Y**
A	ethers	primary alcohol
B	carboxylic acids	phenols
C	primary alcohol	carboxylic acids
D	Phenol	ether

12. An ammonical silver nitrate solution is added into a test tube containing an unknown organic compound. Upon reflux, a silver mirror is deposited on the walls of the test tube.

The inference that can be made about this unknown compound is that, in this compound,

A. ketone is present and aldehyde is absent.
B. ketone is absent and aldehyde is present.
C. phenol is present and alcohol is absent.
D. phenol is absent and alcohol is present.

13. Consider the given organic compound.



Oxidation of the given compound will form the

A. CH_3COOH
B. CH_3COCH_3
C. CH_3COOCH_3
D. CH_3CH_2CHO

14. Given table shows the physical and chemical tests performed on an unknown organic compound **X**.

	Test	Observation
Physical Test	Physical state	Solid
	Solubility in water	Insoluble in cold water but soluble in hot water
	Solubility in ether	Soluble in ether
	Ignition test	Smoky flame
Chemical Test	0.2 g of compound was heated with C_2H_5OH and concentrated H_2SO_4	Fruity smell is observed.
Confirmatory Test	Added few crystals of compound to neutral solution of $FeCl_3$	Buff coloured precipitate is obtained.

On the basis of these tests and their observations, it can be inferred that **X** contains

A. aromatic amine.
B. benzoic acid.
C. ethyl acetate.
D. diethyl ether.

15. If an unknown sample of carboxylic acid is heated with soda-lime, then the observation that CORRECTLY matches with its inference is

	Observation	Inference
A	Pungent vapours evolved	Acetic acid is present.
B	Vapours of C_6H_6 evolved that burnt with smoky flame	Benzoic acid is present.
C	Fruity smell observed	Formic acid is present.
D	Effervescence of CO and CO_2 without blackening	Oxalic acid is present.

END OF PAPER

Please use this page for rough work

Please use this page for rough work