AGA KHAN UNIVERSITY EXAMINATION BOARD

SECONDARY SCHOOL CERTIFICATE

CLASS X EXAMINATION

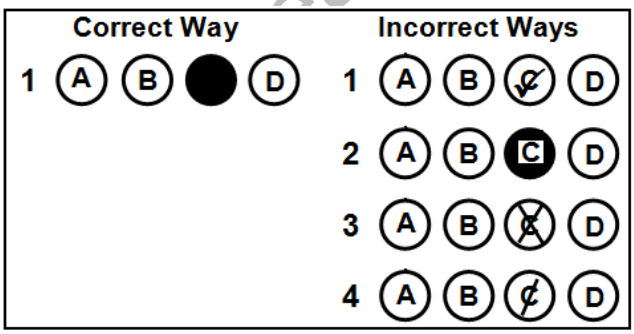
APRIL/ MAY 2019

Chemistry Paper I

Time: 40 minutes Marks: 25

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 25 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 simple calculator if you wish.

1. In an endothermic reversible reaction, an increase in temperature will

   A. stop the reaction from proceeding further.
   B. shift the equilibrium in the reverse direction.
   C. shift the equilibrium in the forward direction.
   D. equalise the rate of forward and reverse reactions.

2. The condition that is NOT required for equilibrium is a/ an

   A. closed system.
   B. constant temperature.
   C. equal amounts of reactants and products.
   D. equal rates of both forward and backward reactions.

3. Which of the given reactions will have the unit of K_c as $mol^{-1}dm^3$?

   A. $SO_{3(g)} + NO_{(g)} \rightleftharpoons SO_{2(g)} + NO_{2(g)}$
   B. $2SO_{3(g)} \rightleftharpoons 2SO_{2(g)} + O_{2(g)}$
   C. $2NO_{(g)} + O_{2(g)} \leftrightarrows 2NO_{2(g)}$
   D. $N_2O_{4(g)} \leftrightarrows 2NO_{2(g)}$

4. What happens when the following two soluble salts are mixed?

   $BaCl_{2(aq)} + 2AgNO_{3(aq)} \rightarrow ?$

   A. Two soluble salts are produced.
   B. Two insoluble salts are produced.
   C. One insoluble salt, water and a gas are produced.
   D. One soluble salt and one insoluble salt are produced.

5. Consider the given chemical reaction.

   $$Ca(OH)_{2(aq)} \underset{}{\overset{\text{Water}}{\rightleftharpoons}} Ca^{2+}_{(aq)} + 2OH^-_{(aq)}$$

   The given chemical reaction exemplifies

   A. Lewis concept.
   B. Arrhenius concept.
   C. Faraday's concept.
   D. Bronsted-Lowry concept.

6. If the hydroxyl ion concentration of a solution is 1×10^{-12}, then the nature of the solution would be

   A. highly basic.
   B. highly acidic.
   C. slightly basic.
   D. slightly acidic.

7. Alkanes, alkenes and alkynes are classified as organic compounds. This is because they all

   A. are hydrocarbons.
   B. are saturated molecules.
   C. have high melting points.
   D. have high rate of reaction.

8. Nonane is an alkane containing nine carbon atoms per molecule.

   The molecular formula of nonane is

   A. C_9H_{16}
   B. C_9H_{18}
   C. C_9H_{20}
   D. C_9H_{22}

9. A compound that contains ester functional group is

   A. CH_3CH_2CHO
   B. CH_3CH_2COOH
   C. $CH_3COCH_2CH_3$
   D. $CH_3COOCH_2CH_3$

10. $H_2C = CH - CH = CH - CH_3$

    The IUPAC (international union of pure and applied chemistry) name of the given organic compound is

    A. 1,3-pentene.
    B. 2,4-pentene.
    C. 1,3-pentadiene.
    D. 2,4-pentadiene.

11. Under normal conditions, alkanes do not react with strong oxidising agents such as potassium permanganate ($KMnO_4$). This is because of all of the following reasons EXCEPT that alkanes

    A. have non-polar bonds.
    B. give substitution reactions.
    C. are saturated hydrocarbons.
    D. are soluble in polar solvents.

12. C_2H_5OH can be converted into C_2H_4 by the process of

    A. reduction.
    B. dehydration.
    C. neutralisation.
    D. polymerisation.

13. Compared to ribonucleic acid (RNA), a molecule of deoxyribonucleic acid (DNA) is

    I. single stranded
    II. self-replicating
    III. located in mitochondria

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

14. Maltose is a disaccharide in which two molecules of glucose join together by a/ an

    A. ester linkage.
    B. peptide bond.
    C. glycosidic linkage.
    D. phosphodiester bond.

15. Examples of micro-minerals are

    A. iron and zinc.
    B. sodium and iodine.
    C. potassium and sulphur.
    D. calcium and phosphorus.

16. The hydrogenation of vegetable oils in the presence of nickel as a catalyst at 60°C results in the formation of a compound **X** having **Y** bonds.

    Which of these represents **X** and **Y**?

	X	**Y**
A	Saturated fats	Single bonds
B	Unsaturated fats	Single bonds
C	Saturated fats	Double bonds
D	Unsaturated fats	Double bonds

17. It is advised to switch off gas heaters before going to sleep.

    This is because the combustion of natural gas in a poorly ventilated room produces

    A. carbon dioxide.
    B. sulphur dioxide.
    C. nitrogen dioxide.
    D. carbon monoxide.

18. Presence of pollutants in air has an adverse effect on the environment.

    In order to control air pollution, a country's government should ensure that its citizens AVOID the

    A. use of private vehicles.
    B. plantation of more trees.
    C. use of non-combustible sources of energy.
    D. setting up of industries away from residential areas.

19. When decomposers feed on dead organic matter, they return carbon to air as carbon dioxide. This information shows an interaction between

    A. lithosphere and biosphere.
    B. biosphere and atmosphere.
    C. atmosphere and lithosphere.
    D. hydrosphere and lithosphere.

20. Permanent hardness in water is due to the presence of chlorides and sulphates of

    A. sodium.
    B. potassium.
    C. aluminium.
    D. magnesium.

21. When hard water is passed through a column of an ion exchange resin, the resin absorbs

    A. sodium ions.
    B. calcium ions.
    C. chloride ions.
    D. sulphate ions.

22. Jaundice is caused due to an increase in the amount of

    A. iron in the blood.
    B. red cells in the blood.
    C. uric acid in the blood.
    D. bile pigments in the blood.

23. A mineral found in the earth's crust from which metals are extracted is known as a/ an

    A. ore.
    B. slag.
    C. gangue.
    D. metalloid.

24. $CO_{2(g)} + 2NH_{3(g)} \xrightarrow{\text{heat/ pressure}} ?$

The product(s) of the given reaction is/ are

A. $NH_4HCO_{3(s)}$
B. $(NH_4)_2CO_{3(s)}$
C. $NH_2COOH_{(s)} + H_{2(g)}$
D. $(NH_2)_2CO_{(s)} + H_2O_{(g)}$

25. During the extraction of copper, impurities float in the form of slag over the molten mixture of copper compounds.

The slag obtained in this extraction is

A. FeS
B. FeO
C. $FeSiO_3$
D. $CuFeS_2$

END OF PAPER

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Please use this page for rough work