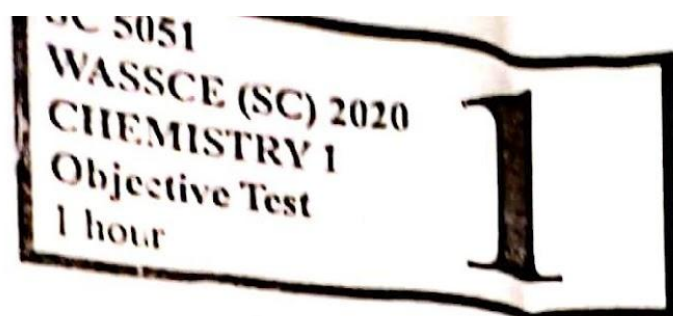


CHEMISTRY PAST QUESTIONS AND ANSWERS

This past questions is compiled by ghstudents.com and it's to serve as a study guide for candidates participating in the West African Examination Council (WAEC) examination. This past question is **NOT FOR SALE**.

Chemistry Past Questions (OBJECTIVE) 2020



Compiled by ghstudents.com

Index Numh

THE WEST AFRICAN EXAMINATIONS COUNCIL

West African Senior School Certificate Examination (WASSCE) for School Candidates, 2020
SC 2020

CHEMISTRY 1

1 hour

OBJECTIVE TEST

Do not open this booklet until you are told to do so. While you are waiting, write your name and index number in the spaces provided at the top right-hand corner of this booklet and thereafter, read the following instructions carefully.

1. Use HB pencil throughout.
2. If you have got a blank answer sheet, complete its top section as follows.
 - (a) In the space marked *Name*, write in capital letters your surname followed by your other names.
 - (b) In the spaces marked *Examination*, *Year*, *Subject* and *Paper*, write 'WASSCE (SC)', '2020', 'CHEMISTRY' and '1' respectively.
 - (c) In the box marked *Index Number*, write your index number vertically in the spaces on the left-hand side. There are numbered spaces in line with each digit. Shade carefully the space with the same number as each digit.
 - (d) In the box marked *Paper Code*, write the digits 505113 in the spaces on the left-hand side. Shade the corresponding numbered spaces in the same way as for your index number.
 - (e) In the box marked *Sex*, shade the space marked M if you are male, or F if you are female.
3. If you have got a pre-printed answer sheet, check that the details are correctly printed, as described in 2 above. In the boxes marked *Index Number*, *Paper Code* and *Sex*, re-shade each of the shaded spaces.
4. An example is given below. This is for a male candidate whose name is Chinedu Oladapo DIKKO, whose index number is 3251102068 and who is offering CHEMISTRY 1.

THE WEST AFRICAN EXAMINATIONS COUNCIL

PRINT IN BLOCK LETTERS

Name: DIKKO CHINEDU OLADAPO Examination: WASSCE (SC) Year: 2020
Surname Other Names

Subject: CHEMISTRY Paper: 1

INDEX NUMBER		PAPER CODE		SEX
4	0 1 2 3 4 5 6 7 8 9	5	0 1 2 3 4 5 6 7 8 9	Indicate your sex by shading the space marked M (for Male) or F (for Female) in this box: M ☐ F ☐
2	0 1 2 3 4 5 6 7 8 9	0	0 1 2 3 4 5 6 7 8 9	
5	0 1 2 3 4 5 6 7 8 9	5	0 1 2 3 4 5 6 7 8 9	
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2	0 1 2 3 4 5 6 7 8 9			
0	0 1 2 3 4 5 6 7 8 9			
6	0 1 2 3 4 5 6 7 8 9			
8	0 1 2 3 4 5 6 7 8 9			

For Supervisors only.
If candidate is absent shade this space: ☐

INSTRUCTIONS TO CANDIDATES

1. Use grade HB pencil throughout.
2. Answer each question by choosing one letter and shading it like this: [A] [B] [C] [D]
3. Erase completely any answer (a) you wish to change.
4. Leave extra spaces blank if the answer spaces provided are more than you need.
5. Do not make any markings across the heavy black marks at the right-hand edge of your answer sheet.

Answer all the questions.

Each question is followed by four options lettered A to D. Find the correct option for each question and shade in pencil on your answer sheet, the answer space which bears the same letter as the option you have chosen. Give only one answer to each question. An example is given below.

Which of the following elements reacts with water?

- A. Carbon
- B. Iodine
- C. Sulphur
- D. Sodium

The correct answer is Sodium, which is lettered D, therefore answer space D would be shaded.

[A]

[B]

[C]

☒ [D]

Think carefully before you shade the answer spaces; erase completely any answer(s) you wish to change.

Do all rough work on this question paper.

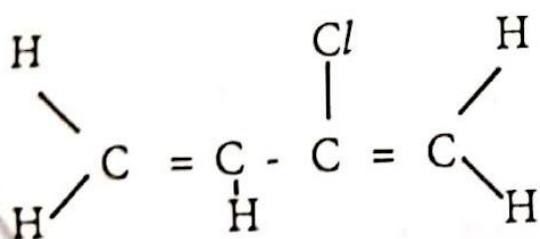
Now answer the following questions.

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1. Which of the following substances is an example of a fine chemical?

- A. Sodium hydroxide
- B. Hydrochloric acid
- C. Ethylene
- D. Ammonia

2. The IUPAC name of the compound represented by the structure below is



- A. 2-chloro but-1,3-diene.
- B. But-1,3-chlorodiene.
- C. 2-chloro but-diene.
- D. 3-chloro but -1,3-diene.

3. Which of the following substances is a polypeptide?

- A. Starch
- B. Glycogen
- C. Protein
- D. Fats

4. Which of the following products could be formed during incomplete combustion of a hydrocarbon?

- I. Carbon
- II. Hydrogen
- III. Carbon (II) oxide

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

5. What quantity of electrons is lost when one mole of iron (II) ions is oxidized to iron (III) ions?

- A. 0 mole
- B. 1 mole
- C. 2 moles
- D. 3 moles

6. What is the mass of silver deposited when 24,125 C of electricity is passed through a solution of silver salt?
[Ag = 108, 1F = 96,500 C]
A. 432 g
B. 108 g
C. 54 g
D. 27 g
7. Equal masses of calcium trioxocarbonate (IV) were added to dilute hydrochloric acid at the temperature specified. Under which of the following conditions would the reaction be slowest?
A. Calcium trioxocarbonate (IV) chips at 20°C
B. Calcium trioxocarbonate (IV) chips at 40°C
C. Calcium trioxocarbonate (IV) powder at 20°C
D. Calcium trioxocarbonate (IV) powder at 40°C
8. The high solubility of ethanol in water is due to
A. its low boiling point.
B. its low freezing point.
C. its covalent nature.
D. hydrogen bonding.
9. Which of the following metals reacts slowly with cold water?
A. Calcium
B. Silver
C. Iron
D. Potassium
10. Which of the following pairs of properties of alkali metals decreases down the group?
A. First ionization energy and reactivity
B. Melting point and atomic radius
C. Reactivity and electronegativity
D. First ionization energy and melting point
11. The most suitable process of obtaining water from an aqueous solution of sugar is
A. crystallization.
B. distillation.
C. filtration.
D. decantation.
12. Group VII elements in their combined states are called
A. halogens.
B. anions.
C. halides.
D. cations.
13. When an ionic bond is broken, bonding electrons are
A. shared between participating atoms.
B. gained by the most electropositive atom.
C. gained by the most electronegative atom.
D. lost by both participating atoms.
14. The oxidation state of chlorine in NaClO_3 is
A. +1
B. +3
C. +5
D. +6
15. A balanced chemical equation is based on the law of
A. periodicity.
B. constant composition.
C. multiple proportion.
D. conservation of mass.
16. Which of the following pairs of elements has the greatest difference in electronegativity?
A. Na and F
B. Na and Cl
C. Na and Br
D. Na and I

27. Which of the following reactions are always exothermic?

- I. Neutralization
- II. Decomposition
- III. Combustion

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

28. Which of the following standard conditions is **not correct** about energy changes?

- A. Standard temperature is 298 K
- B. Standard pressure is 1 atm
- C. Concentration of solution must be 1 mol dm^{-3}
- D. ΔH° at 298 K is the activation energy

29. If 5.0 cm^3 of $0.200 \text{ mol dm}^{-3} \text{ Na}_2\text{CO}_3$ was diluted to 250 cm^3 solution, what would be the concentration of the resulting solution?

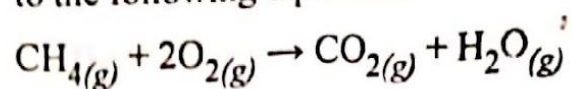
- A. $0.004 \text{ mol dm}^{-3}$
- B. $0.020 \text{ mol dm}^{-3}$
- C. $0.200 \text{ mol dm}^{-3}$
- D. $0.400 \text{ mol dm}^{-3}$

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30. The initial volume and pressure of a given mass of gas is V and 3 P. What is its pressure if its volume is increased to 2V at constant temperature?

- A. 3 P
- B. 2 P
- C. $\frac{3}{2} \text{ P}$
- D. $\frac{2}{3} \text{ P}$

31. What volume of oxygen at *s.t.p* is required to burn completely 7.5 dm^3 of methane according to the following equation?



- A. 3.75 dm^3
- B. 7.50 dm^3
- C. 15.0 dm^3
- D. 30.0 dm^3

32. When 250 cm^3 of a saturated solution of CuSO_4 at 30°C was evaporated to dryness, 5.0 g of the salt was obtained. What is the solubility of the salt at 30°C ?

$$[\text{CuSO}_4 = 160]$$

- A. 0.031
- B. 0.125
- C. 0.640
- D. 1.560

33. The bond between NH_3 and H^+ in NH_4^+ is

- A. dative.
- B. covalent.
- C. hydrogen.
- D. electrovalent.

34. Which of the following oxides has a giant covalent structure?

- A. Al_2O_3
- B. Na_2O
- C. P_4O_{10}
- D. SiO_2

35. Which of the following hydroxides is **not** readily soluble in water?

- A. NH_4OH
- B. $\text{Ca}(\text{OH})_2$
- C. NaOH
- D. KOH

Turn over

36. Which of the following statements about the solubility of a salt is correct?
- A salt whose solubility increases with temperature would not crystallize easily on cooling.
 - A salt whose solubility is independent of temperature would normally crystallize out on cooling.
 - Crystallization would be efficient in separating out a salt whose solubility increases considerably with temperature.
 - Solubility of a solid does not affect its crystallization.
37. How many moles of H_2SO_4 are there in 50 cm^3 of $0.108 \text{ mol dm}^{-3}$ solution of the acid?
- 5.4×10
 - 5.4×10^{-1}
 - 5.4×10^{-2}
 - 5.4×10^{-3}
38. If 20 cm^3 of sodium hydroxide was neutralized by 20 cm^3 of 0.01 mol dm^{-3} tetraoxosulphate(VI) acid, what is the concentration of the solution?
- 0.010
 - 0.020
 - 0.100
 - 0.150
39. "Electrons always occupy the lowest empty energy level" is a statement of
- Aufbau Principle.
 - Hund's rule.
 - Pauli Exclusion Principle.
 - Periodic law.
40. Which of the following metals does not react with water to produce hydrogen?
- Lithium
 - Potassium
 - Sodium
 - Zinc
41. Which of the following arrangement of elements is in decreasing order of electronegativity?
- Na, Mg, Al, Si, P
 - Na, Al, Mg, P, Si
 - P, Mg, Na, Si, Al
 - P, Si, Al, Mg, Na
42. The metallic bond in magnesium is stronger than that in calcium because magnesium has a
- larger atomic size.
 - smaller atomic size.
 - greater number of valence electrons.
 - lower melting point.
43. Consider the reaction represented by the following equation:
- $$\text{AgNO}_{3(aq)} + \text{NaCl}_{(aq)} \rightarrow \text{AgCl}_{(s)} + \text{NaNO}_{3(aq)}$$
- The steps that could be taken to obtain pure dry sample of $\text{AgCl}_{(s)}$ from the mixture includes
- heating to saturation and drying.
 - filtering and evaporation to dryness.
 - filtering, washing and drying.
 - crystallizing and allowing to cool.
44. How many electrons does $^{31}_{15}\text{P}^{3-}$ contain?
- 12
 - 15
 - 16
 - 18

45. The atomic number of an atom would be equal to its mass number if it

- A. has a totally filled valence shell.
- B. has a high charge to mass ratio.
- C. does not contain neutrons.
- D. exhibits isotopy.

46. Which of the following processes is **not** exhibited by atoms in order to attain more stable electron configuration?

- A. Gaining of electrons
- B. Hybridization of orbitals
- C. Losing electrons
- D. Sharing electrons

47. Which of the following quantities is a molar quantity?

- A. Molarity
- B. Molar mass
- C. Mass concentration
- D. Molality

48. Dilution factor is the

- A. amount of distilled water that is added to the concentrated solution to dilute it.
- B. quantity of distilled water added to 1 dm^3 of the concentrated solution to give the dilute solution.
- C. number of times the volume of the concentrated solution is diluted to give the dilute solution.
- D. act of diluting the concentrated solution to obtain the dilute solution.

49. Calcium chloride is an ionic compound. Which of the following statements account for its ionic character?

- I. Calcium has high ionization energy.
 - II. Calcium has low ionization energy.
 - III. Chlorine has high electron affinity.
 - IV. Chlorine has high ionization energy.
- A. I and II only
 - B. I, II and IV only
 - C. II, III and IV only
 - D. I, II, III and IV

50. An example of a biodegradable pollutant is

- A. plastic.
- B. sewage.
- C. carbon (II) oxide.
- D. hydrogen sulphide.

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Chemistry Past Questions and Answers 2020

1 – 10: CACDBDADAD

11-20: AABCDABBCD

21-30: BACACCBDAC

31-40: CBACBADBAD

41-50: DBBDCBCCCB

Chemistry Past Questions (THEORY) 2020

PAPER 2

ESSAY

[100 marks]

Answer four questions in all: Question 1 in Section A and three questions from Section B.
All questions carry equal marks.

No marks will be awarded for answering questions not specified for your own country.
Credit will be given for clarity of expression and orderly presentation of material.

SECTION A

Answer all the questions in this section.

1. (a) (i) State Faraday's first law of electrolysis.

- (ii) Distinguish between a strong electrolyte and a weak electrolyte.

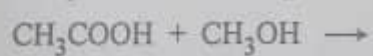
[4 marks]

- (b) State one chemical property of ethyne.

[1 mark]

- (c) (i) What is meant by the term unsaturated hydrocarbon?

- (ii) Complete the following reaction equation:



- (iii) Name the major product formed in the reaction stated in 1(c)(ii).

[4 marks]



(h) (i) State two of the main concepts of Bohr's model of the atom.

(ii) State the limitation of Bohr's model.

[3 marks]

(i) List three factors that could influence the equilibrium position of a reversible reaction.

[3 marks]

(j) Calcium trioxocarbonate (IV) powder is added to separate equimolar solutions of hydrochloric acid and ethanoic acid.

State one:

(i) similarity in the observation in both reactions;

(ii) difference in the observation in both reactions.

[2 marks]

NOKIA

NOKIA

- (d) State one way by which the rate of esterification could be increased.

[1 mark]

- (e) Consider the reaction represented by the following equation:



If 3.75 g of Zn dust was added to excess H_2SO_4 , calculate the number of molecules of hydrogen gas produced.

$$[\text{Zn} = 65.0; \text{N}_A = 6.02 \times 10^{23}]$$

[3 marks]

- (f) State one effect of global warming.

[1 mark]

- (g) Consider the following reaction equations:



- (i) Which of the equations represent(s) redox process?

- (ii) State the change in oxidation number of the species that are oxidized or reduced.

[3 marks]



(ii) What would be the effect of each of the following conditions on the boiling point of water?

I. Addition of crystals of sodium chloride.

II. Reduction of the atmospheric pressure.

(iii) State one way in which *boiling* differs from *evaporation*.

[5 marks]

(c) (i) Differentiate between an *unsaturated solution* and a *saturated solution*.

(ii) State **two** ways by which a saturated solution could be made to dissolve more solute.

(iii) State one factor that could affect the solubility of a solid in a liquid.

(d) (i) Define the term *mole*.

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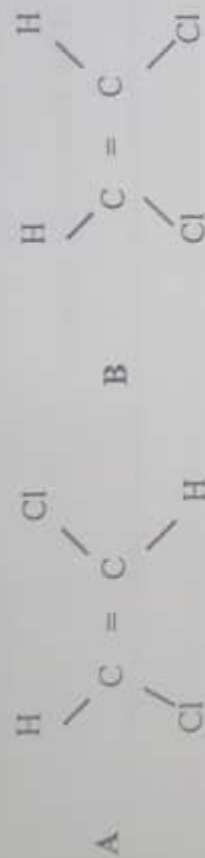
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SECTION B

Answer any three questions in this section.

FOR ALL CANDIDATES

(a) Consider the following compounds:



(i) What is the relationship between the compounds labelled A and B?

(ii) Name each of compounds A and B.

A

B

(iii) Will the chemical properties of compounds A and B be the same?

(iv) Give the reason for the answer stated in 2(a)(iii).

[5 marks]

(b) (i) Give two characteristic features of boiling.



do not
write in this
margin

Candidate's Name

(ii) Consider the following reaction equation:



What mass of magnesium oxide is needed to neutralize 25.0 cm^3 of 0.1 mol dm^{-3} hydrochloric acid?

[O = 16.0; Mg = 24.0]

[7 mark]

(c) State three physical properties of metals.

[3 mark]

NOKIA

Question's Name: _____

(c) What does the value of the slope mean?

[12 marks]

(d) (i) Explain what is meant by *saturated vapour pressure*.

(ii) State the factor that affects saturated vapour pressure.

[3 marks]

II (a) (i) Define *isotopes*.

(ii) Mention two uses of radioactive tracers in each of the following areas:

(a) medicine;

Candidate's Name:

11. (a) In an experiment to measure the specific latent heat of vapourization of water, a student places a heater in a beaker containing water. The beaker stands on an electronic balance so that the mass of the beaker and water could be measured. The heater is switched on and readings taken every 100 s when the water starts boiling.

The table below shows the readings.

Time/s	0	100	200	300	400
Reading on balance/g	203.22	201.62	199.79	198.26	196.50
Mass of water evaporated/g	0				
Energy supplied by heater/J	0				

- Fill in the mass of water evaporated.
- Given that the heater supplies energy at the rate of 38 J/s , fill in the values of the energy supplied by the heater in 100 s, 200 s, 300 s, and 400 s.
- Plot a graph of energy supplied on the vertical axis and mass of water evaporated on the horizontal axis, starting both axes from the origin (0,0).