



**Kuwait University**  
**Office of Assistant Vice President for Evaluation**  
**and Measurement**

**Academic Aptitude Tests**

<b>Student Name</b>
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<b>Version</b>
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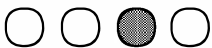
<b>Civil ID No.</b>
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**Instructions:**

1. The aptitude tests consist of three tests.

<u>Test</u>	<u>Number of Questions</u>	<u>Time</u>
English	85	1 Hour
Mathematics	20 (No Calculator)	1 Hour
Chemistry	25	1 Hour

2. Mark all your answers on the **Answer Sheet** and in the proper section. On your answer sheet as shown below, using a pencil, darkenthe proper circle.



3. Verify all personal and test data on answer sheet and don't make any changes unless approved by the proctor.
4. Write down your name and Civil ID# on the test booklet.
5. Copy the test's version on your answer sheet.
6. Follow the proctor's instruction during the test.
7. During testing, be quite and avoid any cheating situation.
8. Observe the allocated and the announced time for each test.

## Chemistry Test

### Atomic Molar Mass (g/mol):

Hydrogen (H)	=	1.01
Carbon (C)	=	12.0
Oxygen (O)	=	16.0
Sodium (Na)	=	23.0
Silicon (Si)	=	28.1
Sulfur (S)	=	32.1
Chlorine (Cl)	=	35.5

### Atomic Number:

Hydrogen (H)	=	1
Lithium (Li)	=	3
Carbon (C)	=	6
Nitrogen (N)	=	7
Oxygen (O)	=	8
Flourine (F)	=	9
Sodium (Na)	=	11
Chlorine (Cl)	=	17
Copper (Cu)	=	29
Iodine (I)	=	53

### Physical Constant:

Ion product constant for water ( $K_w$ ) at 25 °C =  $1.00 \times 10^{-14}$

- Which of the following pairs, do both substances exist as **liquid** at room temperature?
 

(a) Potassium nitrate ( $\text{KNO}_3$ ) and nitric acid ( $\text{HNO}_3$ )	(c) Sodium acetate ( $\text{CH}_3\text{COONa}$ ) and acetic acid ( $\text{CH}_3\text{COOH}$ )
(b) Mercury ( $\text{Hg}$ ) and benzene ( $\text{C}_6\text{H}_6$ )	(d) Iron oxide ( $\text{Fe}_2\text{O}_3$ ) and iodine ( $\text{I}_2$ )
- Which of the following aqueous solutions has a pH value less than 7.00?
 

(a) $\text{Na}_2\text{SO}_4(\text{aq})$	(c) $\text{H}_2\text{CO}_3(\text{aq})$
(b) $\text{Ba}(\text{OH})_2(\text{aq})$	(d) $\text{KNO}_3(\text{aq})$
- What is the correct chemical name of the compound ( $\text{CuSCN}$ )?
 

(a) Copper(I) thiocyanate	(c) Copper(II) thiocyanate
(b) Chromium(II) thiocyanate	(d) Chromium(I) thiocyanate
- Which of the following statements is **false**?
  - Burning methane gas ( $\text{CH}_4(\text{g})$ ) in air produces water and carbon dioxide gas ( $\text{CO}_2(\text{g})$ )
  - Dissolving sugar in a cup of tea forms homogeneous mixture
  - Adding acetic acid ( $\text{CH}_3\text{COOH}(\text{aq})$ ) to a solid sodium carbonate ( $\text{Na}_2\text{CO}_3(\text{s})$ ) produces gas bubbles of  $\text{CO}_2(\text{g})$
  - Adding aqueous solution of sodium hydroxide ( $\text{NaOH}$ ) to an aqueous solution of nitric acid ( $\text{HNO}_3$ ) produces salt, water and gas
- Propane ( $\text{CH}_3\text{CH}_2\text{CH}_3$ ) and butene ( $\text{CH}_3\text{CHCH}_2\text{CH}_3$ ) are organic compounds, which of the following statements is correct for the two compounds?
  - Both are saturated hydrocarbon compounds
  - Both are unsaturated hydrocarbon compounds
  - Propane is an alkene and butene is an alkane
  - Propane is an alkane and butene is an alkene
- The simplest chemical method that can be used to differentiate between aqueous solutions of hydrated barium chloride ( $\text{BaCl}_2 \cdot 2\text{H}_2\text{O}$ ) and potassium nitrate ( $\text{KNO}_3$ ) is to add aqueous solution of .....
 

(a) sodium chloride ( $\text{NaCl}$ )	(c) nitric acid ( $\text{HNO}_3$ )
(b) sodium sulfate ( $\text{Na}_2\text{SO}_4$ )	(d) potassium chloride ( $\text{KCl}$ )
- In sodium atom ( $\text{Na}$ ), the last electron is in the ..... energy sublevel (subshell):
 

(a) 1s	(c) 3s
(b) 2s	(d) 2p

8. What is the solubility product constant ( $K_{sp}$ ) expression for a saturated solution of silver arsenate ( $Ag_3AsO_4$ )?

- (a)  $K_{sp} = [3Ag^+]^3 [AsO_4^{3-}]$                       (c)  $K_{sp} = 1 / [Ag^+]^3 [AsO_4^{3-}]$   
(b)  $K_{sp} = [Ag^+]^3 [AsO_4^{3-}]$                       (d)  $K_{sp} = [Ag^+]^3 / [AsO_4^{3-}]$

9. The correct number of electrons, neutrons and protons in the cation: ( $^{194}_{81}Tl^{3+}$ ) are:

- (a) 81 electrons, 275 neutrons and 81 protons  
(b) 81 electrons, 113 neutrons and 84 protons  
(c) 78 electrons, 275 neutrons and 84 protons  
(d) 78 electrons, 113 neutrons and 81 protons

10. Which of the following is a Lewis acid?

- (a)  $H^+(aq)$     (c)  $NaCl(aq)$   
(b)  $HNO_2(aq)$                                         (d)  $Cl^-(aq)$

11. Which of the following compounds contains an ether group?

- (a)  $CH_3CHO$     (c)  $CH_3CH_2COOCH_3$   
(b)  $CH_3COONa$                                         (d)  $CH_3OCH_2CH_3$

12.  $mHCl(aq) + nAl(s) \longrightarrow pH_2(g) + qAlCl_3(aq)$

After balancing the above chemical equation, the coefficient (**p**) is:

- (a) 2    (c) 3  
(b) 6    (d) 4

13. Which of the following substances contains polar covalent bond?

- (a)  $CO(g)$     (c)  $CH_4(g)$   
(b)  $LiCl(s)$     (d)  $N_2(g)$

14. Which of the following chemical substances react with aqueous solution of dilute nitric acid ( $HNO_3$ ) to give, salt, water and gas?

- (a)  $Mg(s)$     (c)  $NaOH(aq)$   
(b)  $K_2CO_3(s)$                                         (d)  $AgNO_3(aq)$

15.  $2NO_2(g) + 4H_2(g) \rightleftharpoons N_2(g) + 4H_2O(g)$

What is the equilibrium constant expression for the above equilibrium system?

- (a)  $K = P_{N_2} \cdot P^4_{H_2O} / P^2_{NO_2} \cdot P^4_{H_2}$   
(b)  $K = 1 / P_{N_2} \cdot P^4_{H_2O}$   
(c)  $K = 1 / P^2_{NO_2} \cdot P^4_{H_2}$   
(d)  $K = P^2_{NO_2} \cdot P^4_{H_2} / P_{N_2} \cdot P^4_{H_2O}$

16. Which of the following substances is a polar covalent compound?
- (a) CuO(s) (c) NaCl(s)  
 (b) Mg(s) (d) HCl(aq)
17. Which of the following aqueous solutions **will not** form buffer solution?
- (a) Weak acid (CH<sub>3</sub>COOH(aq)) and its conjugate base (CH<sub>3</sub>COO<sup>-</sup>(aq)) (c) Weak acid (HCOOH(aq)) and its salt (HCOONa(aq))  
 (b) Strong acid (H<sub>2</sub>SO<sub>4</sub>(aq)) and its salt (Na<sub>2</sub>SO<sub>4</sub>(aq)) (d) Weak base (NH<sub>3</sub>(aq)) and its salt (NH<sub>4</sub>Cl(aq))
18. In which of the following compounds the oxidation number of chromium (Cr) is equal to +3?
- (a) K<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub> (c) Cr<sub>2</sub>O<sub>3</sub>  
 (b) K<sub>2</sub>CrO<sub>4</sub> (d) Cr
19. The bond between the lithium and chlorine atoms in the solid lithium chloride (LiCl) is formed by:
- (a) Sharing one pair of electrons between the two ions (c) Transfer of three electrons from lithium atom to chlorine atom  
 (b) Sharing seven pairs of electrons donated by the chloride ion (d) Transfer of one electron from lithium atom to chlorine atom
20. If the pH of a sample of polluted rain water is equal to 8.25, then the hydroxide ion concentration [OH<sup>-</sup>] of the sample is:
- (a) 1.78 x 10<sup>-6</sup> mol / liter (c) 3.98 x 10<sup>-9</sup> mol / liter  
 (b) 7.48 x 10<sup>-4</sup> mol / liter (d) 5.62 x 10<sup>-9</sup> mol / liter
21. Which of the following compounds has molar mass equal to 82.0 g / mol?
- (a) NaCl(s) (c) CH<sub>3</sub>COONa(s)  
 (b) NaHCO<sub>3</sub>(s) (d) Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub>
22. A nine (9) uniform pieces of a metal are dropped into a graduated cylinder causing water level to rise from 17.00 cm<sup>3</sup> to 29.6 cm<sup>3</sup>. What is the mass of each piece of the metal?  
 [density of the metal = 2.50 g / cm<sup>3</sup>?
- (a) 3.50 g (c) 4.50 g  
 (b) 7.00 g (d) 12.6 g



Answers - Chemistry Exam

إجابات اختبار الكيمياء

Q's#	Answers	Q's#	Answers	Q's#	Answers	Q's#	Answers	Q's#	Answers
1 -	A <input checked="" type="radio"/> B <input type="radio"/> C <input type="radio"/> D	6 -	A <input checked="" type="radio"/> B <input type="radio"/> C <input type="radio"/> D	11 -	A <input type="radio"/> B <input type="radio"/> C <input checked="" type="radio"/> D	16 -	A <input type="radio"/> B <input type="radio"/> C <input checked="" type="radio"/> D	21 -	A <input type="radio"/> B <input checked="" type="radio"/> C <input type="radio"/> D
2 -	A <input type="radio"/> B <input checked="" type="radio"/> C <input type="radio"/> D	7 -	A <input type="radio"/> B <input checked="" type="radio"/> C <input type="radio"/> D	12 -	A <input type="radio"/> B <input checked="" type="radio"/> C <input type="radio"/> D	17 -	A <input checked="" type="radio"/> B <input type="radio"/> C <input type="radio"/> D	22 -	<input checked="" type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D
3 -	<input checked="" type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D	8 -	A <input checked="" type="radio"/> B <input type="radio"/> C <input type="radio"/> D	13 -	<input checked="" type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D	18 -	A <input type="radio"/> B <input checked="" type="radio"/> C <input type="radio"/> D	23 -	A <input type="radio"/> B <input type="radio"/> C <input checked="" type="radio"/> D
4 -	A <input type="radio"/> B <input type="radio"/> C <input checked="" type="radio"/> D	9 -	A <input type="radio"/> B <input type="radio"/> C <input checked="" type="radio"/> D	14 -	A <input checked="" type="radio"/> B <input type="radio"/> C <input type="radio"/> D	19 -	A <input type="radio"/> B <input type="radio"/> C <input checked="" type="radio"/> D	24 -	A <input type="radio"/> B <input checked="" type="radio"/> C <input type="radio"/> D
5 -	A <input type="radio"/> B <input type="radio"/> C <input checked="" type="radio"/> D	10 -	<input checked="" type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D	15 -	<input checked="" type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D	20 -	<input checked="" type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D	25 -	A <input checked="" type="radio"/> B <input type="radio"/> C <input type="radio"/> D

Answers - Mathematics Exam

إجابات اختبار الرياضيات

Q's#	Answers	Q's#	Answers	Q's#	Answers	Q's#	Answers
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2 -	A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D	7 -	A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D	12 -	A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D	17 -	A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D
3 -	A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D	8 -	A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D	13 -	A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D	18 -	A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D
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