

University of Bahrain
Department of Chemistry
CHEMY 101 (3rd Hour Exam)

First Semester 2008-2009
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Time: 90 minutes

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$$h = 6.626 \times 10^{-34} \text{ J}\cdot\text{s}, c = 3.0 \times 10^8 \text{ m/s}, R_H = 2.18 \times 10^{-18} \text{ J}$$

Name:----- I.D. #----- Section #-----

Q.1. What is the **frequency** of a light whose energy is $3.60 \times 10^{-17} \text{ J}$?

- a) $5.43 \times 10^{16} \text{ Hz}$ b) $3.42 \times 10^{15} \text{ Hz}$ c) $8.65 \times 10^{17} \text{ Hz}$
d) $2.14 \times 10^{16} \text{ Hz}$ e) $7.85 \times 10^{15} \text{ Hz}$

Q.2. What is the **wavelength** that corresponds to the emission of electron from $n=7$ to $n=3$?

- a) 695 nm b) 760 nm c) 1006 nm
d) 364 nm e) 854 nm

Q.3. A line in the Lyman series occurs at 121.53 nm. Calculate n_{high} for the transition.

- a) 5 b) 4 c) 3 d) 2 e) 6

Q.8. The number of **unshared (lone) pairs** of electrons in ClO_3^- is

- a) 7 b) 8 c) 9 d) 10 e) 11

Q.9. The number of **bonding electrons** around S atom in SO_3 is

- a) 6 b) 8 c) 10 d) 12 e) 14

Q.10. The **formal charge** in the nitrogen atom (N) in NO_3^- is

- a) +1 b) -1 c) 0 d) +2 e) -2

Q.11. The **molecular geometry** of ClF_3 is

- a) Trigonal planar b) tetrahedral c) T-Shape
d) Square planar e) Trigonal pyramidal

Q.12. Which of the following molecules or ions has the **same electronic structure as N_2**

- a) O_2 b) CN^- c) F_2
d) answers **a** and **c** are correct e) answers **b** and **c** are correct

Q.13. Which one of the following **does not** show resonance?

- a) NO_3^- b) NO_2^- c) CO_3^{2-} D) SO_2 e) BeCl_2

Q.14. All the following molecule obey the octet rules **except**

- a) CO_2 b) SF_4 c) H_2O d) NH_3 e) CO_3^{2-}

Q.15. Which one of the following does not show **expanded octet**?

- a) SF_6 b) PCl_5 c) SF_4 d) CH_4 e) XeF_2

Part B

Q.1. Which **gas** is produced when $\text{CaCO}_3(\text{s})$ is treated with $\text{HCl}(\text{aq})$?

- a) Cl_2 b) H_2 c) CO_2 d) HCl e) CO

Q.2. The main compound present in **aspirin** is:

- a) Acetyl Salicylic Acid b) Acetic acid
c) Salicylic acid d) Sodium acetate
e) Sodium sulfate

Q.3. **Molar mass** of metal carbonates can be determined by:

- a) Precipitation titration b) Back titration
c) By the addition of a base d) By the addition of a salt
e) By the addition of water

Q.4. The **indicator** used in the titration of $\text{NaOH}(\text{aq})$ and $\text{HCl}(\text{aq})$ is:

- a) phenolphthalein b) Potassium chromate
c) HCl d) H_2SO_4
e) HNO_3

Q.5. What happens when CO_2 is passed through **lime water**?

- a) Becomes yellow
- b) Becomes red
- c) Becomes milky
- d) Becomes blue
- e) No change

Q.6. When vinegar is treated with NaOH (aq) what **compound** is formed?

- a) $\text{CH}_3\text{CO}_2\text{H}$
- b) $\text{CH}_3\text{CO}_2\text{Na}$
- c) HCl
- d) NaCl

Q.7. How **many mL of water** should be added to 100 mL, 5 M nitric acid to make it 2.5 M?

- a) 100 mL
- b) 200 mL
- c) 150 mL
- d) 300 mL
- e) 50 mL