



# TRIAL UPS 1

sk015

Consists of 20 C1 & C2 questions.

10 questions from Chapter 1 and another 10 questions from Chapter 2.

1. Two naturally occurring isotopes of iridium are  $^{191}\text{Ir}$  and  $^{193}\text{Ir}$  in the ratio of 5:8 respectively. Calculate the relative atomic mass of iridium.

- A. 129
- B. 119
- C. 219
- D. 192

2. The atomic masses of  $^{47}\text{Ti}$  and  $^{48}\text{Ti}$  are 47.0051u and 48.0560u respectively. Calculate the relative abundance of  $^{48}\text{Ti}$ , if the average atomic mass of Ti is 47.8864u.

- A. 0.7868
- B. 0.2132
- C. 0.8386
- D. 0.1614

3. A 1.375 g sample of mannitol, a sugar found in seaweed, is burned completely in oxygen to give 1.993 g of carbon dioxide and 0.9519 g of water. The empirical formula of mannitol is?

- A. CHO
- B.  $\text{CH}_8\text{O}_3$
- C.  $\text{C}_3\text{H}_2\text{O}$
- D.  $\text{C}_3\text{H}_7\text{O}_3$

4. A concentrated phosphoric acid solution contains 85% by mass of  $\text{H}_3\text{PO}_4$ . Calculate the molality of the phosphoric acid.

- A. 58.7 m
- B. 57.8 m
- C. 75.8 m
- D. 65.7 m

5. What is the molarity of  $\text{Cr}_2\text{O}_7^{2-}$  solution prepared by dissolving 2.78g  $\text{Na}_2\text{Cr}_2\text{O}_7$  in distilled water and the final volume of the solution is 500 mL?

- A. 0.20 M
- B. 0.037 M
- C. 0.021 M
- D. 0.370 M

6. Solve the following redox reaction that occurs in acidic condition.



- A.  $\text{NO}_3^- + 4\text{Zn} + 10\text{H}^+ \longrightarrow \text{NH}_4^+ + 4\text{Zn}^{2+} + 3\text{H}_2\text{O}$
- B.  $\text{NO}_3^- + 4\text{Zn} \longrightarrow 10\text{H}^+ + 3\text{H}_2\text{O}$
- C.  $\text{NO}_3^- + 4\text{Zn}^{2+} + 10\text{H}^+ \longrightarrow 4\text{Zn} + 3\text{H}_2\text{O} + \text{NH}_4^+$
- D.  $\text{NO}_3^- + 4\text{Zn}^{2+} + 10\text{H}^+ \longrightarrow 4\text{Zn} + 3\text{H}_2\text{O}$

7. The reaction between acetic acid,  $\text{CH}_3\text{COOH}$  and 17.13 g of Barium hydroxide,  $\text{Ba}(\text{OH})_2$  produces a salt. If the reaction produced 22.40g of salt, determine the percentage yield of this reaction.

- A. 87.74%
- B. 114.11%
- C. 43.86%
- D. 57.05%

8. 128g KBr is dissolved in 925g of water. What is the molality of the KBr solution?

- A. 0.021 m
- B. 0.21 m
- C. 1.162 m
- D. 0.016 m

9. The empirical formula of a compound of uranium and fluorine that is composed of 67.6% uranium and 32.4% fluorine is ( Ar U = 238.0 g mol<sup>-1</sup>, Ar F = 19.0 g mol<sup>-1</sup> )

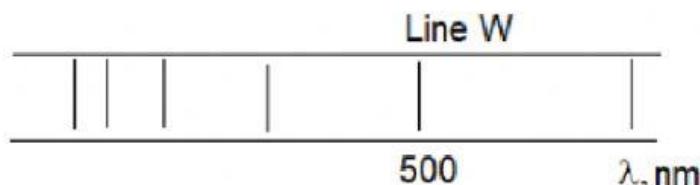
- A. U<sub>2</sub>F
- B. U<sub>3</sub>F<sub>4</sub>
- C. UF<sub>4</sub>
- D. UF<sub>6</sub>

10. 12.88 g of a metal oxide, M<sub>2</sub>O<sub>3</sub> reacts with excess hydrogen gas to produce metal M and 4.35 g of water. What is the relative atomic mass of atom M.



- A. 55.90
- B. 65.40
- C. 63.60
- D. 159.80

11. The following figure shows lines in visible region of a spectrum of hydrogen atom. Which of the following is the transition of electron between levels of energy that gives rise to line W?



- A. n<sub>2</sub> to n<sub>1</sub>
- B. n<sub>3</sub> to n<sub>2</sub>
- C. n<sub>2</sub> to n<sub>3</sub>
- D. n<sub>4</sub> to n<sub>2</sub>

12. The difference in energy between the second and third energy levels of a hydrogen atom is  $3.03 \times 10^{-19}$  J. What is the wavelength of the photon emitted. When transition occurs between these two energy levels?

- A. 456 nm
- B. 656 nm
- C. 832 nm
- D. 230 nm

13. What is the energy, in  $\text{Jmol}^{-1}$ , of one mole of photons emitted with a frequency of  $6.336 \times 10^{15}$  Hz?

- A.  $4.20 \times 10^{-18} \text{ Jmol}^{-1}$
- B.  $3.96 \times 10^{-17} \text{ Jmol}^{-1}$
- C.  $2.53 \times 10^6 \text{ Jmol}^{-1}$
- D.  $3.88 \times 10^{14} \text{ Jmol}^{-1}$

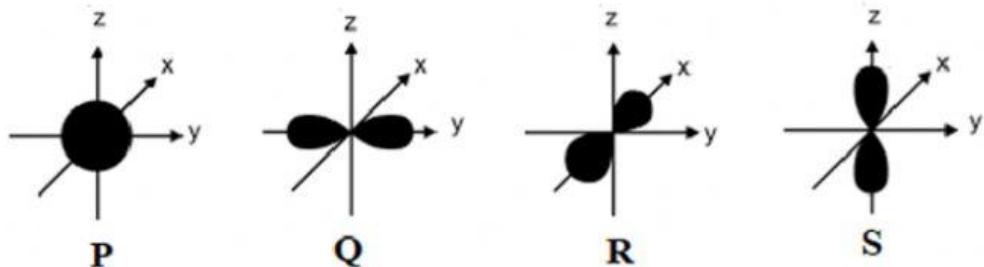
14. The fourth line of Balmer series has a wavelength of 410nm. What is the frequency?

- A.  $1.23 \times 10^2 \text{ s}^{-1}$
- B.  $6.32 \times 10^{14} \text{ s}^{-1}$
- C.  $1.37 \times 10^{15} \text{ s}^{-1}$
- D.  $7.32 \times 10^{14} \text{ s}^{-1}$

15. Which of the following sets of quantum numbers describe the electron in 3d orbital.

- A.  $n = 3 \quad l = 2 \quad m = 0 \quad s = +1$
- B.  $n = 3 \quad l = 2 \quad m = 0 \quad s = +1/2$
- C.  $n = 3 \quad l = 2 \quad m = -3 \quad s = -1/2$
- D.  $n = 3 \quad l = 1 \quad m = 2 \quad s = +1/2$

16. The figure shows the orbitals of the highest energy electrons located at the third shell of Y element. Orbital P and Q are fully filled, while R and S are half filled. Determine the proton number of Y element.



- A. 6
- B. 14
- C. 16
- D. 18

17. The set of quantum numbers for three electrons with the highest energy of an atom A are shown below. What is the electronic configuration of ion A if three electron were removed from atom A?

$n=3 \ l=2 \ m=-1 \ s= -1/2$

$n=3 \ l=2 \ m= 0 \ s= -1/2$

$n=3 \ l=2 \ m=-2 \ s= -1/2$

A.

$1s^2 \ 2s^2 \ 2p^6 \ 3s^2 \ 3p^6 \ 4s^2$

B.

$1s^2 \ 2s^2 \ 2p^6 \ 3s^2 \ 3p^6 \ 4s^2 \ 3d^1$

C.

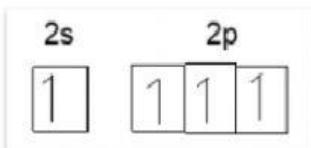
$1s^2 \ 2s^2 \ 2p^6 \ 3s^2 \ 3p^6 \ 4s^2 \ 3d^3$

D.

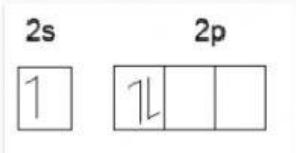
$1s^2 \ 2s^2 \ 2p^6 \ 3s^2 \ 3p^6 \ 3d^2$

18. Which of the following orbital diagrams describe Hund's rule?

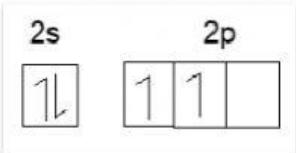
A.



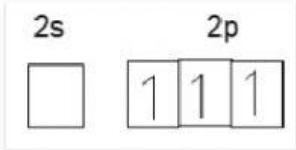
B.



C.



D.



19. The electronic configuration of copper atom is  $1s^2 2s^2 2p^6 3s^2 3p^6 4s^1 3d^{10}$ . Determine the number of electron in the copper atom in the group state with magnetic quantum number,  $m=0$ .

- A. 7
- B. 13
- C. 10
- D. 12

20. The anomaly in electronic configuration of Copper-29 is an example of disobeying the rule/principle of:

- A. The Pauli's exclusion principle
- B. The Aufbau's principle
- C. The Heisenberg's uncertainty principle
- D. Hund's rule