



# ST. LAWRENCE HIGH SCHOOL

27, BALLYGUNGE CIRCULAR ROAD

**Class : 11****Subject : CHEMISTRY****Term : FIRST TERM****Max Marks : 60**

**Q 1 :** Elements X and Y combine to form two compounds XY and X<sub>2</sub>Y. Find the atomic weight of X and Y, if the weight of 0.1 moles of XY is 10g and 0.05 moles of X<sub>2</sub>Y is 9g

**Marks : 1**

1. 30, 20

2. 80, 20

3. 60, 40

4. 20, 30

 ( This Answer is Correct )

**Q 2 :** Which of the following are isoelectronic species?

**Marks : 1**1. H<sup>+</sup>, H and H<sup>-</sup>2. Li<sup>+</sup>, Na<sup>+</sup> and K<sup>+</sup>3. Cl<sup>-</sup>, Br<sup>-</sup> and I<sup>-</sup>4. F<sup>-</sup>, Ne and Na<sup>+</sup> ( This Answer is Correct )

**Q 3 :** The empirical formula and molecular mass of a compound are CH<sub>2</sub>O and 180 g respectively. What will be the molecular formula of the compound?

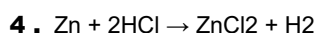
**Marks : 1**1. C<sub>9</sub>H<sub>18</sub>O<sub>9</sub>2. CH<sub>2</sub>O3. C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>4. C<sub>2</sub>H<sub>4</sub>O<sub>2</sub> ( This Answer is Correct )

**Q 4 :** Which of the following acid has the maximum basicity?

**Marks : 1**1. H<sub>3</sub>BO<sub>3</sub>2. H<sub>3</sub>PO<sub>4</sub>3. H<sub>2</sub>SO<sub>3</sub>4. HClO<sub>2</sub> ( This Answer is Correct )

**Q 5 :** Which of the following represents a redox reaction?

**Marks : 1**1. NaOH + HCl → NaCl + H<sub>2</sub>O2. BaCl<sub>2</sub> + H<sub>2</sub>SO<sub>4</sub> → BaSO<sub>4</sub> + 2HCl3. CuSO<sub>4</sub> + 2H<sub>2</sub>O → Cu(OH)<sub>2</sub> + H<sub>2</sub>SO<sub>3</sub>

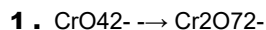


( This Answer is Correct )

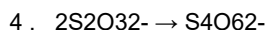
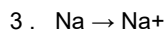
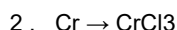
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**Q 6 :** Which reaction involves neither oxidation nor reduction?

**Marks :** 1



( This Answer is Correct )



**Q 7 :** Determine the equivalent weights of the following marked compounds by applying the oxidation number and electronic methods-  $\text{SO}_2 + 2\text{H}_2\text{O} \rightleftharpoons \text{H}_2\text{SO}_4$

**Marks :** 1

1. 32

( This Answer is Correct )

2. 64

3. 25

4. 23

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**Q 8 :**  $a\text{Zn} + b\text{NaOH} + c\text{NaNO}_3 = d\text{Na}_2\text{ZnO}_2 + e\text{NH}_3 + f\text{H}_2\text{O}$

**Marks :** 1

1.  $a=2, c=2$

2.  $a=1, c=3$

3.  $a=4, c=1$

( This Answer is Correct )

4.  $a=3, c=5$

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**Q 9 :**  $x\text{Al} + y\text{NaOH} + z\text{H}_2\text{O} = m\text{Na}_2\text{AlO}_2 + n\text{H}_2$

**Marks :** 1

1.  $y=1, m=2$

2.  $y=2, m=2$

3.  $y=3, m=4$

4.  $y=1, m=1$

( This Answer is Correct )

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**Q 10 :**  $a\text{P}_4 + b\text{NaOH} + c\text{H}_2\text{O} = d\text{Na}_2\text{H}_2\text{PO}_2 + e\text{PH}_3$

**Marks :** 1

1.  $a=1, d=2$

2.  $a=3, d=4$

3.  $a=1, d=3$

4.  $a=1, d=3$

( This Answer is Correct )

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**Q 11 :** Find the oxidation number of S in  $\text{H}_2\text{SO}_5$

**Marks :** 1

1. 6

( This Answer is Correct )

2. 5

3 . 4

4 . 1

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**Q 12 :** Which among the following has the maximum equivalent mass?

**Marks :** 11 .  $K_2Cr_2O_7$ 2 .  $Na_2S_2O_3 \cdot 5H_2O$ 3 .  $FeSO_4 \cdot (NH_4)_2SO_4 \cdot 6H_2O$ 4 .  $H_2S$  ( This Answer is Correct )

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**Q 13 :** The oxidation number(s) of N in  $(NH_4)NO_3$  is/are-

**Marks :** 1

1 . -3, +5

2 . -3, -5

3 . +3, +5

4 . +3, -5

 ( This Answer is Correct )

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**Q 14 :** Find the successive elements of the periodic table with ionisation energies, 2372, 520 and 890 kJ per mol respectively

**Marks :** 1

1 . Li, Be, B

2 . H, He, Li

3 . B, C, N

4 . He, Li, Be

 ( This Answer is Correct )

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**Q 15 :** The correct order of electron affinity is

**Marks :** 11 .  $Cl > F > O > Br$ 2 .  $F > O > Cl > Br$ 3 .  $F > Cl > Br > O$ 4 .  $O > F > Cl > Br$  ( This Answer is Correct )

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**Q 16 :** Which one will have the highest 2nd ionisation energy?

**Marks :** 11 .  $1s^2 2s^2 2p^6 3s^1$ 2 .  $1s^2 2s^2 2p^4$ 3 .  $1s^2 2s^2 2p^6$ 4 .  $1s^2 2s^2 2p^6 3s^2$  ( This Answer is Correct )

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**Q 17 :** Which is not true about the noble gases?

**Marks :** 1

1 . They are non-metallic in nature

2. They exist in atomic form

3. They are radioactive in nature

( This Answer is Correct )

4. Xenon is the most reactive among these

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**Q 18 :** Identify the wrong sequence of the elements in a group-

**Marks :** 1

1. Ca, Br, Ba

2. Cu, Au, Ag

( This Answer is Correct )

3. N, P, As

4. Cl, Br, I

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**Q 19 :** A gas absorbs photon of 355 nm and emits at two wavelengths. If one of the emission is at 680 nm, the other is at

**Marks :** 1

1. 1035 nm

2. 325 nm

3. 743 nm

( This Answer is Correct )

4. 518 nm

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**Q 20 :** The de-Broglie wavelength of a tennis ball of mass 60g moving with a velocity of 10m/s is approximately

**Marks :** 1

1. 10-33 m

( This Answer is Correct )

2. 10-31 m

3. 10-16 m

4. 10-25 m

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**Q 21 :** The number of unpaired electrons in a chromic ion  $Fe^{+3}$  (atomic number 26) is

**Marks :** 1

1. 3

2. 4

3. 5

( This Answer is Correct )

4. 6

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**Q 22 :** Consider the ground state of Cr atom. The numbers of electrons with the azimuthal quantum numbers,  $l=1$  and 2 are, respectively

**Marks :** 1

1. 12 and 4

2. 12 and 5

( This Answer is Correct )

3. 16 and 4

4. 16 and 5

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- Q 23 :** The electronic configuration of Hg is **Marks : 1**
1.  $1s^2 2s^2 2p^6 3s^2 2p^6 10 4s^2 2p^6 10 5s^2 2p^6 10 6s$   ( This Answer is Correct )
2.  $1s^2 2s^2 2p^6 3s^2 2p^6 10 4s^2 2p^6 10 5s^2 2p^6 10 7s^2$
3.  $1s^2 2s^2 2p^6 3s^2 2p^6 10 4s^2 2p^6 10 5s^2 2p^6 10 8s^2$
4.  $1s^2 2s^2 2p^6 3s^2 2p^6 10 4s^2 2p^6 10 5s^2 2p^6 9 6s^3$
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- Q 24 :** Which of the following conclusions could not be derived from Rutherford's  $\alpha$ -particle scattering experiment? **Marks : 1**
1. Most of the space in the atom is empty
2. The radius of the atom is about  $10^{-10}$  m while that of nucleus is  $10^{-15}$  m
3. Electrons move in a circular path of fixed energy called orbits  ( This Answer is Correct )
4. Electrons and the nucleus are held together by electrostatic forces of attraction
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- Q 25 :** The pair of ions having same electronic configuration is \_\_\_\_\_. **Marks : 1**
1.  $Cr^{3+}$ ,  $Fe^{3+}$
2.  $Fe^{3+}$ ,  $Mn^{2+}$   ( This Answer is Correct )
3.  $Fe^{3+}$ ,  $Co^{3+}$
4.  $Sc^{3+}$ ,  $Cr^{3+}$
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- Q 26 :** The equation used for calculating Lattice energy **Marks : 1**
1. Bond-Lande equation  ( This Answer is Correct )
2. Pauling equation
3. Milliken equation
4. None of these
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- Q 27 :** Which of the following pairs have the same state of hybridization? **Marks : 1**
1.  $NH_3$  &  $H_2O$   ( This Answer is Correct )
2.  $H_2O$  &  $BF_3$
3.  $BeCl_2$  &  $BF_3$
4. None of these
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- Q 28 :** Which of the following has the "See-saw" shape? **Marks : 1**
1.  $SF_4$   ( This Answer is Correct )
2.  $SF_6$
3.  $XeF_4$
4.  $XeO_4$
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**Q 29 :** Which of the following has/have the same shape?

**Marks :** 1

- 1 . XeF<sub>2</sub> & BeCl<sub>2</sub>
- 2 . BeCl<sub>2</sub> & CH<sub>4</sub>
- 3 . I<sub>3</sub><sup>-</sup> & H<sub>2</sub>O
- 4 . All of these

( This Answer is Correct )

**Q 30 :** Between NF<sub>3</sub> and NH<sub>3</sub>, which one has higher dipole moment?

**Marks :** 1

- 1 . NF<sub>3</sub>
- 2 . NH<sub>3</sub>
- 3 . None of these
- 4 . can't be predicted

( This Answer is Correct )

**Q 31 :** Between CD<sub>3</sub>F and CH<sub>3</sub>F, which one has higher dipole moment?

**Marks :** 1

- 1 . CD<sub>3</sub>F
- 2 . CH<sub>3</sub>F
- 3 . Can't be predicted
- 4 . None of these

( This Answer is Correct )

**Q 32 :** A gas X has C<sub>p</sub> and C<sub>v</sub> ratio as 1.4, at NTP 11.2 L of gas X will contain \_\_\_\_\_ number of atoms

**Marks :** 1

- 1 .  $1.2 \times 10^{23}$
- 2 .  $3.01 \times 10^{23}$
- 3 .  $2.01 \times 10^{23}$
- 4 .  $6.02 \times 10^{23}$

( This Answer is Correct )

**Q 33 :** What is the mass percent of carbon in carbon dioxide?

**Marks :** 1

- 1 . 0.03%
- 2 . 27.27%
- 3 . 3.40%
- 4 . 28.70%

( This Answer is Correct )

**Q 34 :** Find the equivalent mass for K<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub> in acidic medium -

**Marks :** 1

- 1 . M/5
- 2 . M/6
- 3 . M/7
- 4 . M/3

( This Answer is Correct )

**Q 35 :** What is the number of ammonia molecules present in 1 millimole of ammonia? **Marks : 1**

1.  $6.022 \times 10^{23}$
2.  $6.022 \times 10^{20}$   ( This Answer is Correct )
3.  $9.066 \times 10^{23}$
4.  $3.011 \times 10^{23}$

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**Q 36 :** Which one of the following properties of an element is variable? **Marks : 1**

1. Valency
2. Atomic weight
3. Equivalent weight
4. Both a and c  ( This Answer is Correct )

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**Q 37 :** The basicity of  $H_3PO_2$  and  $H_3PO_3$  are- **Marks : 1**

1. 1 and 2  ( This Answer is Correct )
2. 3 and 2
3. 3 for both acids
4. 2 and 1

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**Q 38 :** The value of "n"-factor for a salt **Marks : 1**

1. Basicity
2. Total amount of positive charge
3. Both b and d  ( This Answer is Correct )
4. Total amount of positive charge

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**Q 39 :** Oxygen shows positive oxidation number in which of the following compounds? **Marks : 1**

1.  $K_2O$
2.  $CO_2$
3.  $H_2O_2$
4.  $OF_2$   ( This Answer is Correct )

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**Q 40 :** The transition element having maximum number of oxidation states **Marks : 1**

1. Ti
2. Cu
3. Mn  ( This Answer is Correct )
4. Cr

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**Q 41 :**  $\text{KMnO}_4$  exhibits maximum equivalent mass is

**Marks :** 1

1. Acidic medium
2. Basic medium
3. Neutral medium
4. Both acidic and basic medium

( This Answer is Correct )

**Q 42 :** In the modern periodic table, the number of period of the element is the same as

**Marks :** 1

1. Principal quantum number
2. Atomic number
3. Azimuthal quantum number
4. Atomic mass

( This Answer is Correct )

**Q 43 :** Which of the reactions will need the maximum amount of energy?

**Marks :** 1

1.  $\text{Na} \rightarrow \text{Na}^+ + \text{e}^-$
2.  $\text{Ca} \rightarrow \text{Ca}^{++} + \text{e}^-$
3.  $\text{K} \rightarrow \text{K}^{++} + \text{e}^-$
4.  $\text{C}^{2+} \rightarrow \text{C}^{3+} + \text{e}^-$

( This Answer is Correct )

**Q 44 :** Which of the following always increases on going from top to bottom in a group?

**Marks :** 1

1. Metallic character
2. Electronegativity
3. Oxidizing power
4. The tendency to get reduced

( This Answer is Correct )

**Q 45 :** Among halogens, the highest boiling point is shown by

**Marks :** 1

1. Fluorine
2. Chlorine
3. Bromine
4. Iodine

( This Answer is Correct )

**Q 46 :** 14 elements after actinium is called

**Marks :** 1

1. Lanthanides
2. Actinides
3. d-block elements
4. p-block elements

( This Answer is Correct )



**Q 47 :** Identify the group which is not a Dobereiner triad

**Marks :** 1

1. Li, Na, K
2. Be, Mg, Cr
3. Ca, Sr, Ba
4. Cl, Br, I

( This Answer is Correct )

**Q 48 :** Which among the following is not a periodic property of an element?

**Marks :** 1

1. Ionisation energy
2. Electron affinity
3. Electronegativity
4. Radioactivity

( This Answer is Correct )

**Q 49 :** The following sets of quantum numbers represent four electrons in an atom. (i)  $n = 4, l = 1$  (ii)  $n = 4, l = 0$  (iii)  $n = 3, l = 2$  (iv)  $n = 3, l = 1$  In this context, which of the following represents the order of increasing energy?

**Marks :** 1

1. (iv) < (ii) < (iii) < (i)
2. (ii) < (iv) < (i) < (iii)
3. (i) < (iii) < (ii) < (iv)
4. (iii) < (i) < (iv) < (ii)

( This Answer is Correct )

**Q 50 :** The maximum number of electrons in a subshell is given by the expression

**Marks :** 1

1.  $4l - 2$
2.  $4l + 2$
3.  $2l + 1$
4.  $2n^2$

( This Answer is Correct )

**Q 51 :** The electronic configuration of Ag is

**Marks :** 1

1.  $[\text{Kr}] 4d^{10} 5s^1$
2.  $[\text{Kr}] 4d^8 5s^2$
3.  $[\text{Kr}] 4d^9 5s^2$
4. None of these

( This Answer is Correct )

**Q 52 :** Ionic bond strength depends on

**Marks :** 1

1. Ionic charge
2. Interionic distance
3. Bond multiplicity

( This Answer is Correct )

4 . Both a and b

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**Q 53 :** Which of the following is not a property of an ionic compound?

**Marks :** 1

- 1 . High melting point
- 2 . Soluble in polar solvent
- 3 . Has definite geometry
- 4 . Can conduct electricity in dry solid state

 ( This Answer is Correct )

**Q 54 :** Which of the following is used to calculate the mass of an ionic crystal?

**Marks :** 1

- 1 . Ionic mass
- 2 . Formula mass
- 3 . Molecular mass
- 4 . None of these

 ( This Answer is Correct )

**Q 55 :** The number of lone pair of electrons, central atom of XeO<sub>4</sub> contains

**Marks :** 1

- 1 . 0
- 2 . 4
- 3 . 1
- 4 . 3

 ( This Answer is Correct )

**Q 56 :** Two elements X (Atomic mass 75) and Y (Atomic mass 16) combine to give a compound having 75.8% X. The formula of the compound is

**Marks :** 1

- 1 . XY
- 2 . XY<sub>2</sub>
- 3 . X<sub>2</sub>Y<sub>2</sub>
- 4 . X<sub>2</sub>Y<sub>3</sub>

 ( This Answer is Correct )

**Q 57 :** Ionisation energy of He<sup>+</sup> is  $19.6 \times 10^{-18}$  J atom<sup>-1</sup>. The energy of the first stationary state (n=1) of Li<sup>2+</sup> is-

**Marks :** 1

- 1 .  $4.41 \times 10^{-16}$  J atom<sup>-1</sup>
- 2 .  $-4.41 \times 10^{-17}$  J atom<sup>-1</sup>
- 3 .  $-2.2 \times 10^{-15}$  J atom<sup>-1</sup>
- 4 .  $8.812 \times 10^{-17}$  J atom<sup>-1</sup>

 ( This Answer is Correct )

**Q 58 :** If value of h is taken as  $10^{-34}$  kg m<sup>2</sup> sec<sup>-1</sup>, the de-Broglie wavelength of a particle of mass  $10^{-31}$  Kg having velocity 109cm sec<sup>-1</sup> is

**Marks :** 1

- 1 . 0.01 m
- 2 . 2 nm**
- 3 . 0.1 nm
- 4 . 15Å

( This Answer is Correct )

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**Q 59 :** Calculate the percentage of ionic character of HF. Given that the dipole moment of HF is 1.91D and its bond length is 0.92 Å **Marks :** 1

- 1 . 43.25**
- 2 . 5.87
- 3 . 51.27
- 4 . None of these

( This Answer is Correct )

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**Q 60 :** Which of the following is polar?

**Marks :** 1

- 1 . SF<sub>4</sub>**
- 2 . SF<sub>6</sub>
- 3 . XeF<sub>4</sub>
- 4 . XeO<sub>4</sub>

( This Answer is Correct )