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Using Calculator (Yes)

University of Palestine



Final Exam
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Using Dictionary (No)

Q. 1) Indicate if the following statements are true (v) or false (X) :- (15 Marks)

- 1) () A compound is a substance that can be decomposed by chemical means into simpler substances.
- 2) () 400 K equal to 260 °F.
- 3) () Molten NaCl conduct electricity.
- 4) () w/w designation means that the amounts of both solvent and solute are expressed in physical mass units which are grams.
- 5) () Adding more solvent to a given amount of the stock solution decreases the concentration of the solution and changing the number of moles of solute present in the solution.
- 6) () $\text{Ca}(\text{OH})_2$ is considered as strong electrolyte.
- 7) () For solution to occur, the interaction between solvent molecules must be at least as strong as or stronger than those among solvent and solute molecules and those among solute molecules.
- 8) () Triple bond results from the share of three pairs of electrons between two atoms.
- 9) () A liquid's vapour pressure increases as its temperature decreases.
- 10) () CN^- is monatomic ion.
- 11) () molarity is moles of solvent divided by litter of solution.
- 12) () When the forward reaction come to balance with the backward reaction this is called chemical equilibrium.
- 13) () $\cdot \overset{\cdot\cdot}{\text{Se}} \cdot$ is the right Lewis dot symble for Se
- 14) () ΔT_f is directly proportional to solute molality.
- 15) () Actual yield is the maximum obtained yield in the reaction.

Q.2) Define the following chemical terms: (8 Marks)

- 1) Concentration:
.....
.....
- 2) Osmotic pressure:
.....
.....

3) Reduction:

.....
.....

4) pH

.....
.....

Q. 3) Choose the correct answer of each of the following: -

(30 Marks)

<p>1.0 L =</p> <p>a) 1000 mL b) 1000 cm³ c) 1 × 10⁻³ m³ d) All of the above</p>	<p>The result of 1.8 cm × 2.9132 cm to the correct number of significant figures:</p> <p>a) 5.2 cm b) 5.2 cm² c) 5.24 cm² d) 5.24 cm</p>
<p>Which of the following reactions <u>is not</u> acid base reaction:</p> <p>a) SO₂ + H₂O → H₂SO₃ b) H₃PO₃ + 3 KOH → H₂O + K₃PO₃ c) 2CH₃COOH + Ba(OH)₂ → 2H₂O + Ba(CH₃COO)₂ d) Cu(OH)₂ + 2HClO₄ → Cu(ClO₄)₂ + 2H₂O</p>	<p>Which of the following compounds has an ionic bond:</p> <p>a) KBr b) HCl c) CaCl₂ d) Answer a and c</p>
<p>Which of the following <u>is not</u> true about acids:</p> <p>a) Acids have a sour taste b) Acids reacts with Mg to give CO₂ c) Acids cause change of litmus paper colour from blue to red. d) Acids are proton donor</p>	<p>In the following reaction which is the right conjugated acid and base: NH₃(aq) + H₂O(l) → NH₄⁺(aq) + OH⁻(aq)</p> <p>a) NH₃ Base and NH₄⁺ is conjugated acid b) NH₃ acid and NH₄⁺ is conjugated Base c) H₂O Base and OH⁻ is conjugated acid d) NH₃ Base and OH⁻ is conjugated acid</p>
<p>Which of the following is diprotic acid:</p> <p>a) H₃C₆H₅O₇ (Citric Acid) b) H₂C₂O₄ (Oxalic Acid) c) H₂C₆H₆O₆ (Ascorbic Acid) d) Answer b and c</p>	<p>buffers are often prepared by mixing</p> <p>a) Weak Base with its conjugated base b) Weak acid with its conjugated base c) Weak acid with weak base d) Weak acid and strong base</p>
<p>Which of the following compounds has polar covalent bond:</p> <p>a) NaOH b) Cl₂ c) FBr d) None of the above</p>	<p>The coefficient for balancing the following equation Cu(NO₃)₂ + KBr → Br₂ + CuBr + KNO₃ are:</p> <p>a) 2, 3, 1, 2, 4 b) 1, 4, 1, 1, 4 c) 2, 4, 1, 2, 4 d) 2, 4, 1, 2, 4</p>

To lower the freezing point of a solution than the pure solvent you can:

- a) Add a non-volatile solute to the solvent.
- b) Add volatile solute to the solution
- c) Put the solution in the freezer
- d) None of the above

Which of the following species are isoelectronic to each other: Be^{2+} , F^- , Fe^{2+} , N^{3-} , He , S^{2-} , Co^{3+} , Ar

- a) (S^{2-} and N^{3-}) (F^- and Ar)
- b) (Be^{2+} and He) (Fe^{2+} and Co^{3+})
- c) (Fe^{2+} and Be^{2+}) (Be^{2+} and Co^{3+})
- d) (Co^{3+} and He) (S^{2-} and F^-)

If two solutions of identical osmotic pressure are separated by semipermeable membrane,

- a) No osmosis will occur and the solutions called hypertonic
- b) The flow of solvent will be from inside to outside the membrane
- c) No osmosis will occur and the solutions called isotonic.
- d) Osmosis will occur and the two solutions called hypotonic.

Factors affecting the boiling point:

- a) Cohesive forces.
- b) Vapour pressure.
- c) Hydrogen bond
- d) All the above

The name of the following compound K_3As is:

- a) Cadmium selenide
- b) Arsenic acid
- c) Potassium arsenate
- d) potassium arsenide

Q.4) Give the oxidation number of the underlined atom

(5 Marks)

<u>C</u> H_4	<u>K</u> <u>m</u> <u>n</u> O_4	<u>N</u> <u>a</u> <u>I</u> O_3	<u>C</u> O_4^{2-}	<u>P</u> O_4^{3-}
For C =	For Mn =	For I =	For C =	For P =

Q. 5) For the complete redox reactions given below, identify the oxidizing and reducing agents: (9 Marks)

- a) $\text{N}_2(\text{g}) + 3\text{H}_2(\text{g}) \longrightarrow 2\text{NH}_3(\text{g})$
- b) $3\text{Fe}(\text{NO}_3)_2(\text{aq}) + 2\text{Al}(\text{s}) \longrightarrow 3\text{Fe}(\text{s}) + 2\text{Al}(\text{NO}_3)_3(\text{aq})$
- c) $2\text{NaI}(\text{aq}) + \text{Cl}_2(\text{aq}) \longrightarrow \text{I}_2(\text{aq}) + 2\text{NaCl}(\text{aq})$

Oxidizing Agent	a)	b)	c)
Reducing agent	a)	b)	c)

Q.6) a) Explain why water is a very good solvent?

(2 Marks)

b) Explain why Liquid and molten covalent compounds do not conduct electricity? **(2 Marks)**

c) Ionic compounds are solids? (2 Marks)

d) Strong Acids are strong electrolytes? (2 Marks)

Q.7) Solve the following problems: **(Total 25 Marks)**

a) What is the mass in grams of 9.23×10^{24} molecules of CO_2 ? (6 Marks)

b) Calculate the volume of 1.50 M Na_3PO_4 in millilitres that contains 2.50 g of solute. (5 Marks)

c) How would you prepare an isotonic saline solution 0.92% NaCl w/v? (4 Marks)

d) How much 7.50% v/v solution of ethanol in water can be prepared with 17.6 mL of ethanol? (5 Marks)

e) What is the molarity of a solution containing 14.63 g of NaCl in 658 mL? (5 Marks)