



Answer all the following questions:

Question 1: Choose the correct answer:

[20 marks, 45 min.]

1. Force of attraction between positive metal ions and the 'sea of delocalized electrons' is...
A) Ionic bond B) Metallic Bond C) Covalent bond D) Coordinate bond
2. A natural polymer of amino acids known as
A) Precipitate B) Complex C) Protein D) Molecule
3. A sub-atomic particle in the nucleus of an atom. It has a mass but has no electrical charge known as
A) Neutron B) Proton C) Positron D) Electron
4. A naturally occurring substance (elements or compounds) in rocks are.....
A) Mixture B) Minerals C) Carbon D) Mole
5. A naturally-occurring molecule found in each cell. It has the ability to hold and transmit coded hereditary instructions allowing for an organism's development. There are two types of nucleic acids: DNA and RNA.
A) Formic acid B) Acetic acid C) Nucleic acid D) Sulfuric acid
6. A table that contains horizontal rows and vertical columns of elements The elements are arranged in order of their atomic numbers and in accordance with their chemical properties known as
A) Periodic Table B) Reducing agent
C) Precipitating agent D) Oxidising agent
7. The mass of one mole of a substance. Unit is g.mol^{-1} Has the same value as Ar or Mr refers to
A) Atomic number B) Atomic mass C) Molar mass D) Neutron mass
8. A substance that brings about oxidation of another substance. It is itself reduced in the process of oxidising others is
A) Complexing agent B) Reducing agent
C) Precipitating agent D) Oxidising agent
9. Gases that are unreactive and do not form compounds because they have the duplet or octet configuration known as
A) Hydrogen gas B) Noble gas C) Active gas D) Oxygen gas
10. The amount of a substance that contains the same number of particles is ...
A) Minerals B) Mixture C) Mole D) Carbon

11. The central part of an atom consisting of neutrons and protons is —
A) Nucleus B) Shells C) Orbitals D) Neutron
12. An insoluble solid that is produced in a solution as a result of a chemical reaction is —
A) Precipitate B) Complex C) Molecule D) Ion
13. A group of two or more atoms that are chemically held together by covalent bonds is —
A) Minerals B) Mixture C) Mole D) Molecule
14. A reaction where a substance gains oxygen or loses hydrogen also defined as the loss of electron(s) or the increase in oxidation state of the element is —
A) Oxidation B) Reduction C) Charge transfer D) Electron
15. The presence of toxic substances in the environment which are harmful to living things known as
A) Photochemical Smog B) Pollution C) Petrochemicals D) Pollutant
16. "At constant temperature, the volume of a gas is directly proportional to the number of moles of the gas present". This is the statement of — law.
A) Dalton's B) Avogadro's C) Boyle's D) Graham's
17. The reaction of a substance with oxygen and heat is evolved. This is called:
A) oxidation B) reduction C) hydration D) combustion
18. Hydrocarbons having the general formula C_nH_{2n-2} is called
A) alkanes B) alkynes C) alkenes D) alkyl radicals
19. A positively or negatively charged particle. It is formed when an atom or group of atoms loses or gains one or more electrons is called:
A) a cation B) an anion C) an ion D) a neutral atom
20. The product of a force and the displacement is the mathematical definition of
A) potential energy B) force C) work D) Kinetic energy

[20 marks, 20 min.]

Q2. True or False:

1. Halogens are elements of the Group VII of the periodic table.
2. Isotopes are different forms of the same element that have the same mass number but differ in the atomic number.
3. Greenhouse effect is warming of the earth by greenhouse gases.
4. Reduction is a process includes losing of one or more electrons.
5. Oxidizing agent is a substance that loses one or more electrons.
6. An alloy is a mixture of a metal with non-metals or other metals.
7. Hydrocarbons having the general formula C_nH_{2n+2} are called alkynes.
8. The temperature at which a liquid turns rapidly to its vapour, and it occurs throughout the whole liquid is called the boiling point.
9. Cations are ions of one atom or group of atoms carry negative charges.

10. An energy transferred due to a temperature difference is called temperature.
11. "The ability of performing a motion against an opposing force" is the definition of work.
12. The Group is a horizontal row of elements in the periodic table.
13. Avogadro's number is the number of particles in one mole of a substance, and it has the value of 6.02×10^{23} .
14. Aqueous Solution is the solution of a substance in water. In chemical equations, it has the symbol (aq) is used to represent aqueous solutions.
15. Biogas is a gas that is produced when organic matter (waste material from plants and animals) is allowed to decay in the absence of air.
16. Concentration is the amount of a solute that is dissolved in a unit volume of the solution.
17. A three-dimensional network of atoms or ions packed together in a regular pattern is called "Giant Structure".
18. A covalent bond is electrostatic forces of attraction that holds positive and negative ions together in an ionic compound.
19. Hydrated Salts are salts that contain hydrogen of crystallization.
20. Kinetic energy of an object is an energy due to velocity or motion of this object.

Q. 3: Match between the concepts in column (A) with the proper statements in column (B) [10 marks, 15 min.]

	<u>Column (A)</u>		<u>Column (B)</u>
1	Energy	A	The minimum energy that reactant particles must possess during their collisions in order, for a chemical reaction, to occur.
2	Absolut temperature	B	Compounds that have the same molecular formula but different structural formulae.
3	pH	C	The condition in which air contains a high concentration of certain chemicals that may harm living things or damage non-living things.
4	Homologous series	D	A substance which increases the speed of a chemical reaction and remains chemically unchanged at the end of the reaction.

5	Isomer	E	A scale that measures the acidity and alkalinity of a solution. It is the negative logarithm of hydrogen ion concentration.
6	Activation Energy	F	is the energy associated with the chaotic "random" motion of molecules at temperatures above absolute zero.
7	Air Pollution	G	The non-metallic elements in Group VII of the periodic table of the elements.
8	Thermal energy	H	This is the lowest temperature possible. It is equal to - 273°C.
9	halogen	I	A family of organic compounds with members of the family having the same general formula and similar chemical properties.
10	Catalyst	J	The ability of doing work.

Q. 4: Define the following chemical terminology:

[20 marks, 40 min.]

1. Weak acid:

2. Neutralisation:

3. Oxidation:

4. Voltaic Cells:

5. Titration:

6. Viscosity:

7. Precipitate

8. Valency:

9. Unsaturated Molecule:

10. Thermodynamics:

11. Speed of Reaction:

12. Reversible Reaction:

13. Stoichiometry:

14. Redox Reaction:

15. Saturated Solution:

16. Quantitative Analysis:

17. Saturated Hydrocarbons:

18. Suspension:

19. Reduction:

20. Protons

End of exam

Examination Committee: Prof. W. S. Abdel Halim and Prof. A.A. Gouda

Best Wishes