



ST. LAWRENCE HIGH SCHOOL
A JESUIT CHRISTIAN MINORITY INSTITUTION



Second Term Test – 2019

Subject: Physical Science
Duration: 2hr 30minutes

Class: 9
MODEL ANSWER

F.M: 75
Date: 07/08/19

Group-A

1×13=13

A. Choose the correct answer:

- To protect tooth decay you are advised to brush your teeth regularly, the nature of commonly used paste is Ans : **c) Basic**
- The dimension of force is---- Ans : **d) [MLT⁻²]**
- Velocity is a---- Ans : **a) Vector**
- The momentum of a body of given mass is proportional to its ___ Ans : **c) Speed**
- 'MOLE' means _ Ans : **d) Avogadro's number of any particle**
- The components of crude oil are separated by **b) Fractional Distillation**
- The electronic configuration of Na atom is ___ **c) 2,8,1**
- Addition of one electron in the outermost shell of a chlorine atom, if produce a ___ Ans : **b) Anion**
- If you soak a pH paper into gastric juices it will indicate a pH ___ Ans : **b) <7**
- S.I unit of energy is Ans : **a) joule**
- Example of systemic antacid is Ans : **a) Na₃C₆H₅O₇**
- C.G.S unit of pressure is Ans : **a) dyne cm⁻²**
- Solid iodine and ethanol can be separated from their mixture by Ans : **b) Evaporation**

GROUP-B

Answer the following questions:

1×16=16

A. Fill in the blanks:

1×5=5

- AgNO₃ solution is added to NaCl solution to give a curdy white precipitate, the process by which the precipitate is separated from the mixture is called **Filtration.**
- Unit of relative atomic mass is **Unitless**
- The electronic configuration of Al atom is **2,8,3**
- Work done per unit time is called **power.**
- Action and reaction forces act on **different** bodies.

B. Complete the following reactions :

1×6=6

- $2\text{HCl} + \text{Ca(OH)}_2/\text{CaO} \longrightarrow \text{CaCl}_2 + 2\text{H}_2\text{O}$
- $\text{H}_2\text{SO}_4 + \text{Zn} \longrightarrow \text{ZnSO}_4 + \text{H}_2$
- $\text{Al} + 2\text{NaOH} \longrightarrow \text{NaAlO}_2 + \text{H}_2$
- $\text{HNO}_3 + \text{NH}_4\text{OH} \longrightarrow \text{NH}_4\text{NO}_3 + \text{H}_2\text{O}$
- $\text{CaO} + \text{SO}_2 \longrightarrow \text{CaSO}_3$
- $\text{AgNO}_3 + \text{HCl} \longrightarrow \text{AgCl} + \text{HNO}_3$

C. Match the column:

1×5=5

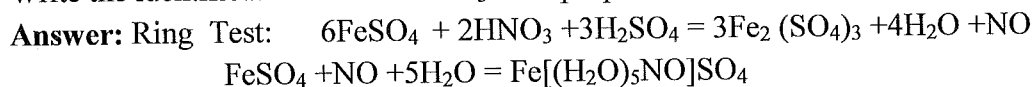
Column A	Column B
a) Absolute unit of work	4) joule
b) Power	1) watt
c) A stretched spring	5) Potential energy
d) Flowing water	2) Kinetic energy
e) Freely falling body	3) Conservation of energy

GROUP-C

2×8=16

A. Short answer type question :

1. Write the identification test for HNO₃ with proper reactions.



2. What are the basic differences between Normal salt and acid salt.

Answer : Normal salt: Complete replacement of replaceable hydrogen atoms in acid molecule by metal/metal like compound radicals.

Acid salt: Partial replacement of replaceable hydrogen atoms in acid molecule by metal/metal like compound radicals.

3. 1000J of work is done to move a body through a distance of 10m in the direction of the applied force. Find out the applied force.

Answer: Force=Work done/Distance=1000J/10m=100N

4. What do you mean by nuclear forces and ionization energy.

Answer : Nuclear force: Force binding the nucleons in the nucleus.

Ionization energy: Energy required to remove an electron from an isolated gaseous atom in its ground state from its valence shell to produce gaseous cation.

5. An object of mass 20kg is accelerated uniformly from a velocity of 36kmh⁻¹ to 54kmh⁻¹ in 25 s .calculate
a. The initial and final momentum of the body.

Answer: Initial momentum = mass x initial velocity = 20 kg x 36(5/18) m/s = 200 kg m/s and Final momentum = mass x final velocity = 20 kg x 54(5/18) m/s = 300 kg m/s

- b. The force acting on the body.

Answer: Force acting = (change in momentum)/time = (300m/s – 200m/s) / 25s = 4 N

6. Why are the weights in a weight box in the proportion of 5:2:2:1?

Answer: To get all the weights from 1 to 10 or multiples of it in the given unit.

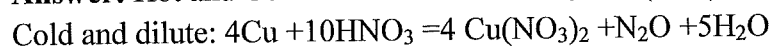
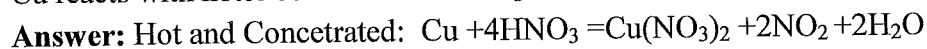
7. What is antacid? What are the types of antacids ?give example

Answer: Antacid: Decrease the production of acid and control the pH

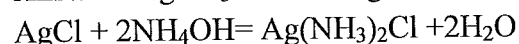
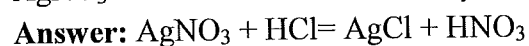
Types of antacids are : Systemic: example - NaHCO₃ Non systemic: example - MgCO₃

8. What happens when:

- a. Cu reacts with hot& concentrated HNO₃ and cold diluted HNO₃.



- b. AgNO₃ reacts with HCl followed by addition of NH₄OH.



GROUP-D

B. Long answer type question: (Any ten)

3×10=30

1. What are the fundamental particles of atom? Among these which one is lightest and which one is heaviest? (1+2)

Answer: Proton, Electron(Lightest) and Neutron (Heaviest)

2. Find the pressure at a depth of 5m below the surface of a lake.(density of water=1000kgm⁻³)

Answer: For g = 9.8 m/s² Pressure = depth x density x acceleration due to gravity = 5 x 1000 x 9.8 = 49000 Pa;

For g = 10 m/s² Pressure = depth x density x acceleration due to gravity = 5 x 1000 x 10 = 50000 Pa

3. A motor car moving north to south with uniform velocity goes 60km in 3hr .find the velocity of the car.
Answer: velocity of car = displacement/time = 60km/3hr = 20 km/hr = $20 \times (5/18)$ m/s = 5.55 m/s
 A body starts from rest with uniform acceleration of 2ms^{-2} . What will be its velocity after 10s?
Answer: $v = u + at = 0 + (2 \times 10) = 20$ m/s
4. What is a unit? What do you mean by the fundamental and derived units? (1+2)
Answer: In measuring any physical quantity, some convenient and definite quantity of it is taken as the standard and in terms of this standard the physical quantity is measured. This standard is called a unit.
Fundamental Unit: Unit of most of the quantities could be derived from the units of three quantities: length, mass and time.
Derived Unit: Units of other physical quantities which are dependent on fundamental units.
5. Give Arrhenius definition of acid and bases. What precautionary measures will you take for safe handling of concentrated acid and base?
Answer: Acid produces H^+ ions and Bases produce OH^- ions after dissociation.
Precautions: Never mouth pipette to transfer the acid, Wear proper personal protective equipment.
6. What are the types of oxide? Explain with example.
 Types of oxides are : Acidic:example - SO_2 Basic: example - Na_2O Amphoteric: example - ZnO
7. Write Newton's 2nd law of motion & from it derive the relationship between force and acceleration.(1+2)
Answer: Statement: The rate of change of momentum is directly proportional to the applied force and takes place in the direction of the applied force.
 $\text{Force} = \text{mass} \times \text{change in momentum} / \text{time} = \text{mass} \times \text{acceleration}$,
8. What is indicator? Give examples of laboratory and common house hold indicators with their colour change in acidic and basic medium.
Answer: The substance which in contact with other substances by their colour change indicates whether a solution is acidic or basic.
 Example of Laboratory indicator : Litmus (acid: red, base: blue)
 Example of Household indicator : Turmeric juice (acid: yellow, base: reddish to deep brown)
9. What is acid rain? Give relevant equations that cause acid rains.
Answer: When pH of rain water is less than 5.6, it is called acid rain.
 Equations: $\text{CO}_2 + \text{H}_2\text{O} = \text{H}_2\text{CO}_3$; $\text{SO}_2 + \text{H}_2\text{O} = \text{H}_2\text{SO}_3$; $2\text{NO}_2 + \text{H}_2\text{O} = \text{HNO}_2 + \text{HNO}_3$
10. A force of 10 N moves a body with a constant velocity of 2ms^{-1} . Calculate the power of the body.
Answer: Power = force x velocity = 10 N x 2 m/s = 20 W
11. Write down the working principle of fractional distillation procedure and explain with proper diagram.
Answer: The process which involves distillation and collection of fractions of different liquids boiling at different temperatures. (Difference in boiling points of the components differ by 15°C - 20°C .)