ASSIGNMENT

CENTRAL UNIVERSITY

1 SILICON HILL

MILE 91

TASK: ASSIGNMENT

NAME: ABDUL LAMIN BRAIMAH

ID NUMBER: 2023008

COURSE: COMPUTER SCIENCE

YEAR: YEAR 1(ONE)

SEMESTER: FIRST

MODULE: PHYSICS

LECTURER: MR MOHAMED A SESAY

A. Define the following **(1)Fundamental Quantities (2)Derived Units (3)Density (4)Relative Density**

1.FUNDAMENTAL QUANTITIES=Fundamental quantities are basic quantities that provides the basic unit of measurement.

2.DERIVED UNITS=Derived units are units obtained from the multiple and combination of the base or fundamental quantities.

3.DENSITY=The density of a substance can be defined as the mass per unit volume of a substance.

4.RELATIVE DENSITY=Relative density of a substance can be defined as the ratio of the mass of a given volume of a substance to the mass of an equal volume of water.

B. State three uses and three limitations of dimension analysis

USES OF DIMENSIONS

1.Dimensional analysis can be used to check the dimensional consistency of equations, helping to identify errors.
2.Dimensional analysis can be used to derive relationship between physical, which can be useful for predicting the behavior of system.
3.Dimensional analysis can be used to convert units between different systems of measurements which can be helpful for comparing and communicating results.

LIMITATION OF DIMENSION

1.Dimension analysis can not provides information about numerical constants that appear in equation or relationship between physical quantities.
2.Dimensional analysis assumes that all relevant physical quantities can be expressed.

C.State the dimensional equations of the following quantities(1)velocity (2)density (3)acceleration.

Solution

VELOCITY=[Distance] but distance=length
            [Time]

$\frac{[length]}{[time]} = \frac{L}{T}$ OR LT^{-1}

DENSITY=[Mass]   =$\underline{M}$ OR $\underline{ML^{-3}}$
           [Volume] L^3

ACCELERATION=[Velocity] =$\underline{LT^{-1}}$ =$\underline{LT^{-2}}$
                  [Time]   T

D. State two difference between scalar and vector quantities: Hence, group the following into scalar and vector quantities: momentum, energy, weight, temperature, work, retardation.

ANSWER: A scalar quantity has only magnitude, but no direction. while Vector quantity has both magnitude and direction. Every scalar quantity is one -dimensional and vector quantity can be one, two or three dimensional.

SCALAR QUANTITIES	VECTOR QUANTITIES
Energy	Momentum
Temperature	Weight
Work	Retardation

E. Distinguish between the following terms: (i) Density and Relative density (ii) Archimedes principle and Law of floatation (iii) Mass and weight.

ANSWER:

DENSITY	RELATIVE DENSITY
It has SI unit	It has no Unit
It defined as mass per unit volume	It defined as the ratio of density of the substance to density of water.

Archimedes principle	Law of floatation
Archimedes' principle describes the scenario of a body either sinking or floating in a fluid.	Principle of a floating describe the scenario of a body floating in a fluid.

Mass	Weight
Mass is a scalar quantity	Weight is a vector quantity

F. A piece of iron has a volume of 15cm3 and a mass of 27g. calculate the density of iron in (i) q/cm3 (ii) kg/m3.

SOLUTION

Mass of iron = 27g

Volume = 15 cm3

Density = mass   =   1.8 1000

        Volume   =   1800kg/m3

= 27g

  15cm3

= 1.8g/cm3

G. Define the term linear momentum. (ii) state the law of conservation of linear momentum.

ANSWER:

• LINEAR MOMENTUM: of a body is the product of its mass and velocity when it is in motion.

• LAW OF CONSERVATION OF LINEAR MOMENTUM: State that provided no external forces act on a system of colliding bodies then the sum of momentum before collision is equal to the sum of momentum after collision.

H. Distinguish between perfectly elastic and perfectly inelastic collision?

ANSWER:

PERFECTLY ELASTIC	PERFECTLY INELASTIC
1. Kinetic energy of objects is conserved	1. Kinetic energy is not conserved
2. Force involved are conservative forces	2. Force involved are non-conservative force

I. State Newtons second law of motion?

ANSWER:

State that the time rate of change of momentum of an object is directly proportional to the force acting on it.

J. Explain each of the following terms: (i) Heat (ii) Temperature (iii) thermometric property. Convert the following Fahrenheit temperature into Celsius temperature (1). 98.6°F (II) . 20°F (III). -55°F.

ANSWER:

1. HEAT: Heat is the form of energy that is transferred between system or object with different temperatures.

2. TEMPERATURE: IS the degree of hotness and coldness of a substance .it is measured with a thermometer.

3. THERMOMETRIC PROPERTY: is any physical property that change measurably with temperature. examples of thermometric property: Mercury and Alcohol thermometers

CONSERVATION:

98.6°F   20°F   - 55°F

$C = (F-32)$ $C = (F-32)$ $C = F-32$

$= (98.6 - 32)$ $= (20-32)$ $= (-55-32)$

$= 37°C$ $= -12°C$ $= 37°C$

K. Give two reason why the boiling point of water is sometimes higher than 100?

ANSWER:

• There must be impurities

 • The atmospheric pressure is higher than 1 ATM.

L. List two physical quantities that can be deduced from a velocity time graph?
ANSWER:

1. DISPLACEMENT

 2. ACCELERATION

M. List the types of motion and give examples of each?

Answer:

1. RECTILINEAR MOTION

Examples: running race

2. CIRCULAR MOTION

Examples: Satellite moving around a planet

3. ROTATIONAL MOTION

Examples: the rotation of the earth about it axis causing day and night

 4. OSCILLATORY MOTION

Examples: Simple pendulum

5. RANDOM MOTION

Examples: A Drunken man