PHYSICS COMPETENCE BASED

QUESTIONS WITH ANSWERS

Form One & Two

200+ questions With Answers

Preparation for Necta examination

1st Edition

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Writen by Sir Datius Didas

COMPETENCE BASED QUESTIONS WITH ANSWERS

FORM ONE & TWO

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PHYSICS COMPETENCE BASED QUESTIONS WITH ANSWER FORM 1& 2

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PHYSICS COMPETENCE BASED QUESTIONS WITH ANSWER FORM 1& 2

WORK, ENERGY AND POWER

SHORT SUMMARY AND FORMULA

Work; is the product between force applied and the distance in the same direction. The S I unit of work **JOULE'S** (J) or Newton meter (NM)

Thus work done =Force× distance

Energy; is ability of doing work and its S I unit of work **JOULE'S** (J)

Types of energy

There are two type of energy which are;

(i) Kinetic energy

(ii) Potential energy

Kinetic energy; are form of energy possessed by a body due to its motion. It was given by K.E=$\frac{1}{2}mv^2$ and its S I unit is **joules**

Examples of kinetic energy are

(i) Moving car

(ii) Moving water

(iii) Ocean Waves and Ocean Tides

(iv) Moving Machines

(v) Falling bodies

Potential energy; are type of energy possessed by a body due to its rest or position

Potential energy it depend on Mass of an object, acceleration due to gravity and height

Thus PE=mgh

Examples of potential energy are;

(i) A man sleeping on a bed

(ii) A book placed onto a table

(iii) A ruler put on the table

There was many form of energy, but the following below are some of form of energy are;

(i) Heat energy

(ii) Electromagnetic energy

(iii) Sound energy

(iv) Electrical energy

(v) Nuclear energy

(vi) Mechanical energy

The law of conservation of energy state that *"energy cannot be created nor be destroyed but can be transformed from one form to another"*

Transducer; are those device which are used to convert one form of energy to another, for example **Generator** convert mechanical energy to electrical energy, **A motor** convert electrical energy to mechanical energy, **A microphone** converts sound energy to electrical energy, **Solar panel** convert

solar energy to electrical energy, **Heater** convert electrical energy to heat energy and other like.

POWER; is the rate of doing work, its S I unit are **Watts** (W)

Thus power $=\frac{work\ done}{time}$ or $\frac{energy\ consumed}{time}$

WORKED EXAMPLES

1. **Calculate the amount of work done in raising a block of mass 5 kg through a height of 40 cm. (Take g = 10 ms^{-2})**

Solution

Work done = force × distance

Work done = (mg) h = (5 × 10) × 0.4

Work done = 20 J.

2. **Find kinetic energy of a body of mass 20kg moving with speed of 30m/s**

Solution

Mass (m) =20kg, velocity (v) =30m/s

From K.E=$\frac{1}{2}mv^2$ thus, K.E=$\frac{1}{2}20 \times 30^2$=9000J

The kinetic energy is 9000J or 9KJ

3. **A body of mass 5 kg initially at rest is subjected to a force of 20 N. What is the kinetic energy acquired by the body at the end of 10 S.**

Solution:

Here, m = 5 kg, F = 20 N, t = 10 sec, K.E=?

From F=ma thus a=$\frac{F}{m}=\frac{20}{5}=4ms^{-2}$

Also v=$\frac{a}{t}=\frac{4}{10}=0.\frac{4m}{s}$

Since K.E=$\frac{1}{2}mv^2$

Then K.E=$\frac{1}{2}(5 \times 0.4^2)=0.4$J

The kinetic energy was 0.4J

4. **The momentum of a body of mass 4 kg is 400 kg ms^{-1}. Calculate its K.E.**

Solution.

Here, m = 4 kg, Momentum (p) = 400 kgm/s

From formula P = mv then V=$\frac{P}{m}=\frac{400}{4}$=100m/s

The velocity =100m/s

Since K.E=$\frac{1}{2}mv^2$

Then K.E=$\frac{1}{2}(4 \times 100^2)=20000$J or 20KJ

The kinetic energy was 20000J or 20KJ

5. **. Define the term energy. A ball of mass 0.2 kg is dropped from a height of 20 m. On impact with the ground it losses 30 J of energy. Calculate the height it reaches on the rebound.**

Solution.

Energy; is ability of doing work.

Given that, mass (m) =0.2kg, height (h) =20m, the energy loss (E_T) =30J, Height due to the energy loss (h_2) =?

From E_1=mgh=0.2×10×20=40J

The energy total was given by $E_T = E_1 + E_2$

$E_2 = E_T - E_2$=40J-30J=10J

$$then\ , h_2 = \frac{E_2}{mg} = \frac{10}{0.2 \times 10} = 5m$$

Height it reaches is 5m

6. **A man drops a 10kg of stone from the top of ladder of a 5m, what will be kinetic energy when reach the ground? And what will be the speed just before hits the ground?**

Solution.

Mass (m) =10kg, height (h) =5m, K.E=? and V=?

From law of conservation of energy

Kinetic energy =potential energy

Kinetic energy =mgh=10×5×9.8=490J

Kinetic energy when reach the ground is 490J

Velocity is obtained from

$$K.E=\frac{1}{2}mv^2$$

$$\text{Thus V}=\sqrt{\frac{2K.E}{m}} = \sqrt{\frac{2\times490}{10}} = 9.89m/s$$

The speed just before hits the ground is 9.89m/s

7. A boy of mass 30kg climbs 12steps of a stair case ,each measuring 15cm high in 20sec.calculate the power developed by the boy(Take g = 10 ms^{-2})

Solution

Mass (m) =30kg, number of steps=12, the height of stair case =15cm

Vertical height climbed =height of stair case× number of steps

So height =15cm×12=180cm=1.8m

Time (t)=20sec , force (F)=Mg=30×10=300N

Then Work done =F×d=300N×1.8m=540J

Hence power =$\frac{Work\ done}{time} = \frac{540J}{20sec}$=27watts

The power developed by the boy was 27watts

8. **A man pulls a bucket of water from a well. If he is able to take out 3kg of water from the depth of 20m in 5sec. calculate the power used by man(Take g = 10 ms^{-2})**

Solution.

Given that, mass (m) =3kg, height (h) =20m, time =5sec

$$\text{From Power= XE "energy" time} = \frac{mgh}{t} = \frac{3\times10\times20}{5} = 120W$$

Power used by man is 120J

9. An electrical motor of power 100W is used to drive the stirrer in water bath. Energy supplied to the motor is 20% of power stirring the water. Calculate the work done in one minutes.

Solution.

Power supplied=100W

Power consumed =20%×power supplied=$\frac{20}{100} \times 100W = 20W$

Time =60sec, then work done =power consumed × time

Work done =20W×60sec=1200J

The work done =1200J

10. A man weight 300N runs up a flight of 13steps, each step15cm high, in 3sec.calculate the power of the man.

Solution

Force=300N, number of steps=13, the height of each step=15cm,

Then the vertical height=number of step × height of each step

Thus, vertical height=13×15cm=195cm=1.95m

From Power=$\frac{\text{work done}}{\text{time}} = \frac{F \times h}{t} = \frac{300 \times 1.95}{3} = 195\text{W}$

The power of the man is 195W.

OBJECTIVE QUESTIONS TEST 01

1. As object falls towards the ground, its potential energy

A. Increase B. Remain the same C. Decrease

2. The speed of an object having mass of 5kg and kinetic energy about 400J, what will be the value of its velocity in m/s

A. 10m/s B. 12.6m/s C. 14.5m/s

3. When the velocity of a body is doubled
   A. Its K.E. is doubled
   B. Its P.E. is doubled
   C. Its momentum is doubled
   D. Its acceleration is doubled
4. A moving body need not have
   A. kinetic energy C. potential energy
   B. momentum D. velocity
5. Two spheres of the same size, one of mass 5 kg and the other of mass 10 kg, are dropped simultaneously form a tower. When they are about to touch the ground, they have the same
   A. momentum B. kinetic energy

C. potential energy
D. acceleration

6. Has a K.E. of 1 joule when its speed is
   A. 0.45 m/s
   B. 1 m/s
   C. 1.4 m/s
   D. 4.4 m/s
7. A 1 kg mass has a P.E. of 2 joule relative to the ground when it is at a height of
   A. 0.2 m
   B. 1m
   C. 9.8 m
   D. 32 m
8. A body of mass 5 kg, initially at rest, is moved by a force of 2 N on a smooth horizontal surface. The work done by the force in 10 s is
   A. 20 J
   B. 30 J
   C. 40 J
   D. 60 J
9. Work is always done on a body when
   A. a force acts on it
   B. it moves through a distance
   C. its momentum changes
   D. it experiences an increases in energy through a mechanical influence
10. The kinetic energy of a body becomes four times it initial value. The new linear momentum will be
   A. thrice the initial value
   B. four times the initial value
   C. same as the initial value
   D. twice the initial value

ANSWER FOR TEST 1

1	2	3	4	5	6	7	8	9	10
B	B	C	C	D	C	A	C	D	D

OBJECTIVE QUESTIONS NECTA (FTN 2010-2022)

1. Which of the following is not form of energy
   A. Light
   B. Friction
   C. Magnetism
   D. Electron
2. Work and energy have the same SI unit of ; (FTN 2011)
   A. Calories
   B. Joule
   C. Watts
   D. Pascal

3. Heat energy is transferred from the sun to the earth by process of
   A. Convection
   B. Radiation
   C. Conduction
   D. None of the above
4. The quantity of energy possessed by a body which cause the vibrations of its molecules is;
   A. Temperature
   B. Energy
   C. Heat
   D. Current
5. When a body of mass M, is lifted through a height h, it possesses energy known(FNE 2019) and (FTN 2017)
   A. Kinetic energy
   B. Chemical energy
   C. Light energy
   D. Potential energy
6. Which of the following unit could be used for kinetic energy (FTN 2018)
   A. Kg
   B. N
   C. JS
   D. NM
7. When a body is performing a work, it is said to have (FTN 2018)
   A. Moment
   B. Energy
   C. Momentum
   D. Work
8. The energy which obtained from hot rocks underground is called (FTN 2016)
   A. Geothermal energy
   B. Solar energy
   C. Wind energy
   D. Water energy
9. The rate at which work is done is called; (FTN 2015)
   A. Energy
   B. Watts
   C. Joule per time
   D. Power
10. The energy associated with areas of frequent earthquakes is known as
    A. Tidal energy
    B. Solar energy
    C. Geothermal energy
    D. Wind energy
11. The energy formed due to the rising and falling in the level of water in the ocean or sea known as
    A. Electrical energy
    B. Tidal energy
    C. Water energy
    D. Wind energy
12. The product of force and displacement is known as (FTN 2012)
    A. Energy
    B. Momentum
    C. Power
    D. Work done

13. What is the SI unit of power? (FTN 2020)

A. Joule per metre
B. Meter per second
C. Meter per second^2
D. Joule per second

Answer for objective necta questions (FTN 2010-2022)

1	2	3	4	5	6	7	8	9	10	11	12	13
D	B	B	D	D	D	B	A	A	C	B	D	D

COMPETENCE QUESTIONS WITH ANSWERS.

1. Give three distinction between potential energy and kinetic energy

Answer.

Kinetic energy	Potential energy
(i) Are energy possessed by a body due to its motion	Are energy possessed by a body due to its rest or position.
(ii) It was given by K.E=$\frac{1}{2}mv^2$	It was given by P.E=mgh
(iii) Example moving car	Example a book is placed on a table.

2. (a) how work differ from energy

(b) What are the main sources of energy give at least four sources

(C) Can a body have momentum without energy, explain.

Answer.

a) Energy is ability of doing work while work is force times perpendicular distance.
b) The main source of energy are
   - ✓ Sun
   - ✓ Wind
   - ✓ Fuel
   - ✓ Water
c) Yes, since When energy E=0 ,a body can possessed kinetic energy which can be given from this relation E=K.E+ P.E=0, since kinetic energy relate with momentum thus K.E=$\frac{1}{2}$pv, where p=mv-momentum

3. Give an example when a work done by force acting on a body is zero even though the body gets displaced from original position by application of force.

   Answer.

   The work done is zero when the displacement and applied force are perpendicular to each other. Thus example are When a person pushes a wall and When a farmer carrying a hole

4. Explain why in trying to move a rigid wall, a person is said to be doing no work

   Answer.

   Because there is no changing position of the wall in term of distance, thus distance d=0m, while great force are applied. Hence no work is done at all.

5. . Name one device which converts:
   a) Heat energy into electrical energy
   b) Mechanical energy into heat energy
   c) Electrical energy into heat energy
   d) Electrical energy into sound energy

   Answer
   a) Thermal power station
   b) Generator
   c) Heater
   d) Speaker

6. An apple of mass 0.3 kg falls to the ground from a height of 21.9 m. If the acceleration due to gravity is 10 m/s^2
   (i) Mention all energy changes that take place in this process
   (ii) Find the energy it possesses before falling Find the energy possessed by the apple when it just reaches the ground.

   Answer

   a) The energy change that place in the process are;
      - ✓ Kinetics energy
      - ✓ Potential energy

   b) Data given

   Mass (m) =0.3Kg, height (h) =21.9m, acceleration due to gravity (g) = 10 m/s^2, potential energy (P.E) = mgh
   P.E=0.3×21.9×10=65.7J

   The potential energy are 65.7J

7. DENSITY AND RELATIVE DENSITY

SHORT SUMMARY AND FORMULA

Density; is the mass per unit volume of a substance.

Thus density $(\rho) = \frac{\text{mass(kg)}}{\text{volume(cm}^3\text{)}}$

The SI unit of density is kg/m^3 or g/cm^3

The instrument which are used to measure density was hydrometer

The density of water was 1000 kg/m^3 or 1 g/cm^3

The density of liquid was given by

$$\text{density of liquid } (\rho) = \frac{(m_1 - m_o)g}{\text{volume of liquid(cm}^3\text{)}}$$

Where $m_0 - mass\ of\ empty\ bottle$

$m_1 - mass\ of\ water\ filling\ the\ bottle$

Relative density; is the ratio of density substance to the density of water

Relative density have no S I unit

Thus Relative density (R. D) = density of water(g/cm^3)

Also relative density can be given by

(R. D) = mass of equal volume of water(kg)

The instrument which are used to determine relative density of a substance are density bottle

WORKED EXAMPLES

1. While doing dishes, Zawadi drops his 3.00×10^{-3}kg of platinum wedding band into the dishwater, displacing a volume of $1.40 \times 10^{-4}m^3$ of water. What is the density of the plantinum band?

   Solution

   Mass of platinum (m) = 3.00×10^{-3}kg

   Volume (v) =$1.40 \times 10^{-4}m^3$

   $$\text{density } (\rho) = \frac{\text{mass(kg)}}{\text{volume(cm}^3\text{)}} = \frac{3.00\times 10^{-3}\text{kg}}{1.40 \times 10^{-4}m^3} = 21.43\ kg/m^3$$

   The density of platinum is 21.43 kg/m^3

2. In an experiment to determine the density of water, Pendo a form one student obtain the following results; mass of beaker =105.7g, mass of water filled in a beaker was 296.8g and the volume of water is 200cm^3, what6 did Pendo obtain as the density of water

Solution

Mass of empty beaker (m_0) =105.7g

Mass of water filled in a beaker (m_1) =286.7g

Volume of water (v) = 200cm^3

From

$$\text{density of liquid } (\rho) = \frac{(m_1 - m_o)\text{g}}{\text{volume of liquid}(\text{cm}^3)}$$

$$= \frac{296.8 - 105.7}{200} = \frac{191.1}{200} = 0.955\text{g/cm}^3$$

The density of water obtained is 0.955g/cm^3

3. Diamond has a density of 3.52 g/cm^3. During a physics lab, a diamond drops out of Virginia's necklace and falls into her graduated cylinder filled with 50cm^3 of water. This causes the water level to rise to the 50.5cm^3 mark. What is the mass of Virginia's diamond?

Solution

The density of diamond =3.52 g/cm^3

Volume of water (v_0) =50cm^3

Volume of water with piece of diamond (v_1) =50.5cm^3

Volume of diamond (v) =$v_1 - v_0$

Mass of diamond (M) =?

From

$$\text{density of diamond } (\rho) = \frac{\text{mass of diamond (m)}}{\text{volume of diamond } (v_1 - v_0)}$$

Mass of diamond=$\rho \times v_1 - v_0 = 3.52 \times (50.5 - 50) = 1.76g$

Mass of diamond was $1.76g$

4. Sir Kimaro was measuring density of liquid in the laboratory by using hydrometer, he wandered when saw the reading of hydrometer read from lowest at upper part to highest at lower part, as form two student explain why the parameter of hydrometer scale are reading so

Answer.

Because the material with high density the hydrometer always sink while the material with less density it float, so in order to measure density the reading of hydrometer should be high at bottom and lower at the top so as to read accurate density of a certain substance.

5. If Marium measure the relative density of stone which is 11.2, what will be the density of stone measured by Mariam

Solution

Relative density =11.2

Density of water=1 g/cm^3

Density of stone =

From

$$\text{Relative density (R.D)} = \text{density of water}(g/cm^3)$$

$$11.2 = \frac{\text{Density of stone}}{1}$$

Density of stone = $11.2 g/cm^3$

6. A rectangular block measures length 6.0cm, width 2.5cm and height 4.0cm
   (i) Name the instrument used to measure the side of rectangular block
   (ii) Calculate the volume and density if their mass is 400g

   Solution

   (i) The instrument used to measure the side of rectangle are venier caliper

   (ii) Volume = length× width ×height

   Volume =6.0cm×2.5cm ×4.0cm=60cm^3

   Mass=400g, density(ρ) $= \frac{\text{mass(kg)}}{\text{volume}(cm^3)} = \frac{400}{60}$

   $= 6.7\ g/cm^3$

   The density of rectangular block is 6.7 g/cm^3

7. Asha a form one student at Marian secondary school, perform an experiment of determining the relative density of cork, the following observations was obtained.

Weight of sinker in water W_1=200g, weight of cork in air and sinker in waterW_2=250g, weight of cork and sinker in water W_3=145g

Solution

The up thrust on cork due to water=weight of the water displaced by the cork

The up thrust on cork due to water=weight of cork in air-weight of cork in water

The up thrust on cork due to water= $(W_2 - W_1)$-$(W_3 - W_1)$

$=(W_2 - W_3)$

=250g-145g=105g

The up thrust on cork due to water=105g

The volume of water displaced by cork= the up thrust on cork due to water

Hence the volume of water displaced by cork=105cm^3

The Relative density (R. D) = volume of water displaced by cork(cm^3)

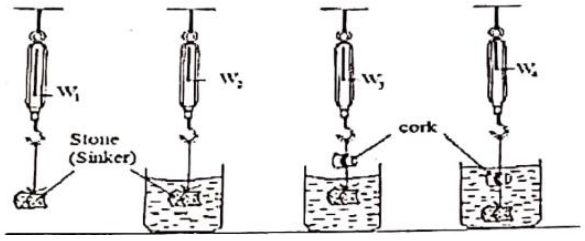
$$\text{Relative density (R. D)} = \frac{(W_2-W_1)}{(W_2-W_3)} = \frac{250g-200g}{250g-145g}=0.47$$

The relative density of cork is 0.47

OBJECTIVE QUESTIONS TEST 06

1. Samia have two copper cylinder with the same cross section area, but one is longer than other. Which quantity is the same for both cylinders?
   A. Density
   B. Volume
   C. Mass
   D. Weight
2. Yohana measure a cube made from a wood with density of 0.6 g/cm^3, he obtain 4cm of its length, 10cm of height and 3cm of its width. What is the mass of cube did he obtain?
   A. 55g
   B. 72g
   C. 120g
   D. 250g
3. Selina measure the length, height and width of the rectangular glass block. Which of these measurement must be used to in order to find the density of glass block?
   A. Length and height only
   B. Mass only
   C. Mass, length, width and height
   D. Both length, width and height

4. Amina measure the volume of alcohol and its masses which are 120 cm^3 and 95g respectively, how does the density of alcohol measured by Amina compared with the density of water?
   A. Its density is greater than that of water
   B. It's impossible to say with only this data
   C. Its density is the same as the water
   D. Its density is less than that of water
5. Why hydrometer has large number in the lower part while small number at upper part?
   A. The hydrometer tend to sink much more in the liquid with high density
   B. The hydrometer float on the liquid with small density
   C. The hydrometer sink much more in the liquid with lower density
   D. The hydrometer measure the density of liquid by placing liquid inside
6. The diagram below shows series of experiments performed by Delphine a student at Bitale secondary school to determine the relative density of a cork that floats in water. Four reading of the spring balance were obtained. The relative density of the cork is given by;



A. $\frac{W_1}{W_1-W_2}$
B. $\frac{W_1-W_2}{W_3-W_2}$
C. $\frac{W_3-W_2}{W_3-W_4}$
D. $\frac{W_3}{W_3-W_4}$

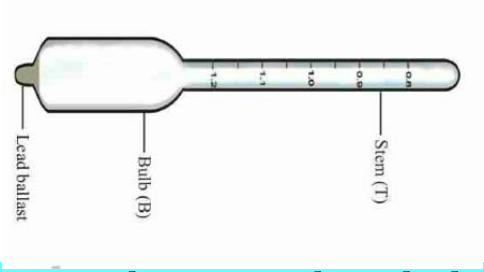
ANSWER TEST 6

1	2	3	4	5	6
A	B	C	C	C	C

PHYSICS COMPETENCE BASED QUESTIONS WITH ANSWER FORM 1& 2

COMPETENCE QUESTIONS WITH ANSWERS

1. In the figure below, explain why are the large numbers on a hydrometer below and small numbers above?



This is because the material with high density the hydrometer always sink while the material with less density it float, so in order to measure density the reading of hydrometer should be high at bottom and lower at the top so as to read accurate density of a certain substance.

2. If a 400g of sold Gold is placed in a eureka can filled with water, what will volume of water over flow

Answer

The volume over flow is equal to the mass of piece of Gold immersed eureka can which is equal to $400cm^3$.

3. The relative density of milk are the same as that of skimmed milk, explain

Answer

No, because the skimmed milk is less dense than milk, hence their relative density are quietly different.

4. The density of water $1000kg/m^3$is what does it imply

Answer

This imply that there is a mass of 1000kg in $1m^3$ space of water.

5. Mawazo saw a wood floating on water, he decided to call a teacher to explain to him the condition made a wood to float on the surface of water. Name the condition a teacher explained to Mawazo

Answer

i. The upthrust due to the liquid must be equal to the total weight of the object
ii. The density of body must lees than thatof fluid
iii. Volume of submerged object must belarge enough to displace a lot of fluid

6. Fishes are very sensitive to a change in salinity. Explain how can you monitor the water in a fish tank to ensure the proper amount of salt.

Answer

Ensure regular testing with hydrometer

7. Rebecca a form one student want to convert the density of water from 1g/cm^3 to $1000kg/\text{m}^3$ but she was confused to do so, as physicist help Rebecca to convert it

Answer

$$1\text{g} = 1000\text{kg}$$

$$1\text{m}^3 = 1000000c\text{m}^3 \; then$$

$$\frac{1\text{g}}{\text{cm}^3} = \frac{1kg/1000g}{(1\text{m}/100\text{cm})^3} = \frac{0.001\text{kg}}{0.000001\text{m}^3} = 1000\text{kg/m}^3$$

Hence $1\text{g/cm}^3 = 1000\text{kg/m}^3$

8. Hydrometer is made heavy near the bottom

Answer

A hydrometer is made heavy near its bottom so that it can float with stem in the vertical position.

9. A hydrometer float with its 8cm immersed in water. What length will it be when immersed in alcohol

Solution

density of water $(\rho_w) = 1g/cm^3$

density of alcohol $(\rho_a) = 0.8g/cm^3$

The length immersed in water$(h_w) = 8cm$

The length when immersed in alcohol$(h_a) =$

From $\frac{\rho_w}{\rho_a} = \frac{h_w}{h_a} = \frac{1g/cm^3}{0.8g/cm^3} = \frac{8cm}{h_a}$

$$h_a = 6.4cm$$

The length when immersed in alcohol(h_a) *is* $6.4cm$

10. Distinguish between density and relative density

Answer

Density	Relative density
Is the mass per unit volume	Is the ratio of density of substance to the density of water
It was symbolized by ρ	It symbolized by R.D
It was measure by using hydrometer	The instrument used to determine relative density was density bottle
The S I unit is g/cm^3	It has no S I unit

OBJECTIVE QUESTIONS NECTA (FTN 2010-2022)

1. The volume of a piece of metal with a mass of 150g and density of 0.03g/cm^3 is (FTN 2011)
   A. $5 \times 10^{-3} cm^3$
   B. $5 \times 10^{1} cm^3$
   C. $5 \times 10^{2} cm^3$
   D. $5 \times 10^{3} cm^3$
2. When buying sugar from a shop you pay for (FTN 2011)
   A. Density
   B. Mass
   C. Volume
   D. Weight
3. A piece of metal with a volume of 0.00012 m^3 has a mass of 0.12kg. the density of metal will be (FTN 2013)
   A. 100 kg/m^3
   B. 1000 kg/m^3
   C. 10,000 kg/m^3
   D. 1,000,000 kg/m^3
4. From the Archimedes principle, the upthrust acting on a body equal to the ; (FTN 2013)
   A. Apparent loss weight
   B. Apparent weight
   C. Weight of a body in air
   D. Weight of a body in water
5. As one goes away from the earth, the density of air; (FTN 2014)
   A. Decrease
   B. Increase
   C. Remain constant
   D. Become greater than its weight
6. Ferry boat float in sea water because its density is; (FTN 2014)
   A. Greater than that water
   B. Small than that water
   C. The same as its weight
   D. Greater than its weight.

7. The tendency of an object to fall or drop lower levels in fluid is called. (FTN 2015)
   A. Floating
   B. Sinking
   C. Upthrust
   D. Buoyant
8. Buoyant force is mainly determined by; (FTN 2016)
   A. volume and density
   B. volume and mass
   C. weight and mass
   D. weight and density
9. An upthrust experienced by the body which weighs 5N in air and 3.2N when it is completely immersed in a liquid is; (FTN 2016)
   A. 0.4N
   B. 0.6N
   C. 1.6N
   D. 1.8N
10. Hydrometer is an instruments used to measure; (FTN 2017)
   A. The volume of liquid
   B. The density of liquid
   C. The density of solids
   D. The volume of liquid

Answer for objective necta questions (FTN 2010-2022)

1	2	3	4	5	6	7	8	9	10
D	B	A	A	C	B	B	A	D	B

NECTA QUESTIONS (FTN 2010-2022

1. The mass of an empty density bottle was 50g. When filled with a curtain liquid of volume 20 $c\text{m}^3$its mass become 75g. find the ;
   (a) Density of liquid
   (b) Relative density of liquid; (FTN 2010)

Solution.

(a) Mass of empty bottle (m_0) =50g
Mass of water filled in a bottle (m_1) =75g
Volume of water (v) = 20cm^3
From

$$\text{density of liquid } (\rho) = \frac{(m_1 - m_o)\text{g}}{\text{volume of liquid}(\text{cm}^3)}$$

$$= \frac{75g - 50g}{20} = \frac{25g}{20} = 1.25\text{g/cm}^3$$

density of liquid (ρ) = $1.25 g/cm^3$

(b) relative density of liquid

From

Relative density (R. D) = XE "Mass"

of water filled in a bottleMass of empty bottle

$$\text{Relative density of liquid(R. D)} = \frac{75g}{50g}$$

Relative density of liquid(R. D) = $1.5 g/cm^3$

2. A body weighs 10N in air and 8N when completely immersed in a liquid in a density 0.8 g/cm^3. find
   (i) The volume of the liquid displaced
   (ii) The density of the body(FTN 2011)

   Solution

   (i) The volume of the liquid displaced= XE "Mass" of fluid displaceddensity of liquid

   Mass of fluid displaced =upthrust

   Upthrust=realweight-apparent weight

   Upthrust =10N-8N=2N

   $$\text{Mass of fluid displaced} = \frac{2N}{10m/s^2} = 0.2kg$$

   Mass of fluid displaced = 0.2kg

   Then

   The volume of the liquid displaced= XE "Mass" of fluid displaceddensity of liquid

   $$= \frac{0.2kg}{0.8\ g/cm^3} = \frac{200g}{0.8\ g/cm^3} = 250 cm^3$$

   The volume of the liquid displaced= $250 cm^3$

   (ii) $$\text{density of body } (\rho) = \frac{\text{mass of body}}{\text{volume displaced}(cm^3)} = \frac{1kg}{250 cm^3}$$

   $$= \frac{1000g}{250 cm^3} = 4 g/cm^3$$

   The density of body is $4 g/cm^3$

3. A spring balance read 12N when a metal block is suspended from it and 10N when the block completely immersed in water. Calculate the;
   (i) Upthrust on the block
   (ii) Relative density of the block(FTN 2013)

   Solution

Upthrust=realweight-apparent weight

Upthrust =12N-10N=2N

(i) Upthrust is 2N

(ii) Relative density (R. D) =

weight of equal volume of water

$$= \frac{real\ weight\ of\ an\ object}{upthrust} = \frac{12N}{2N} = 6$$

Relative density (R. D) = 6

4. (i) Define density and give its SI unit. (FTN 2015)

(ii) list three applications of density in real life

Solution

(i) Density; is the mass per unit volume of a substance.

The SI unit of density is kg/m^3 or g/cm^3

(ii) Application of relative density

- ✓ in designing and constructing ship and boat
- ✓ in operating submarine
- ✓ in the operation of hydrometer
- ✓ in designing aircrafts

5. (a) state Archimedes principle

(b) Define relative density

(c) The mass of a density bottle is 15g. When it is fully with a fluid of density 1.2 g/cm^3, its mass is 51g. Find the volume of the bottle. (FTN 2016)

6. Mention three things that apply the Law of floatation in daily life

- ✓ Balloons
- ✓ Ships/Boats
- ✓ Submarines
- ✓ Hydrometer

PHYSICS COMPETENCE BASED QUESTIONS WITH ANSWER FORM 1& 2

ARCHIMEDES PRINCIPLE AND LAW OF FLOATATION

1. **Why a large ship floats in seas, while the coin sinks into water**?
   - ✓ This is because water displaced by its immersed portion (of a ship/submarine) equal to its weight.
2. **Explain how a steel needle is made to float on water.**
   - ✓ The needle is placed gently on the water surface in a horizontal position due to the Surface tension of the water makes it float
3. **State conditions for a body to float**.
   - ✓ **Conditions for floating are:**
     - **(i)** The object's submerged volume must be large enough so as to displace a lot of fluid.
     - **(ii)** The density of the body must be less than the density of the surrounding fluid.
     - **(iii)** The upthrust due to the liquid must be equal to the total weight of the object.

15. Explain why apparent weight of a body is less than a real weight

- ✓ Because when a body submerged in a fluid it experience an upward force known as **upthrust** which cause the apparent weight to be less than actual weight.

4. **A form one student was arguing that, if you drop a dry wood into water obviously you it floating.**
   a) **With their discussion state all forces acting to the wood while submerged**
      - ✓ **Up thrust**
      - ✓ **Weight of an object**
5. **Majuto saw a wood floating on water, he decided to call a teacher to explain to him the condition made a wood to float on the surface of water. Name the condition a teacher explained to Majuto**
   - ✓ The upthrust due to the liquid must be equal to the total weight of the object
   - ✓ The density of the body must be less than that of fluid.

- ✓ The Volume of submerged object must be large enough to displace a lot of fluid.

6. As form one student how sinking and floatation of an object differ

Answer

Floatation	Sinking
The body stays at the surface of the liquid	The body drops to the bottom of the liquid
Takes place when the density of the body is less than that of the liquid	Takes place when the density of the body is greater than that of the liquid
Takes place when the upward force is greater than the weight of the body	Takes place when the upward force is less than the weight of the object

7. Elaborate about the following terms as applied in physics
   (i) Real weight
   (ii) Upthrust
   (iii) Archimedes principle

   Answer

   i) Real weight is the exactly weight of a body in air.
   (ii) Up thrust is the upward force exerts on an object immersed in a fluid.
   (iii) Archimedes principle state that "Anybody (object) partially or completely immersed in a fluid experiences an up thrust which is equal to the weight of fluid displaced by the body "

8. i) Why does stone a stone weigh more in air than when immersed in water?
   - ✓ A stone weigh more in air than in water because there is more upthrust in water than in air. So the apparent weight is less in air nearly negligible but in water there is more considerably apparent weight.

9. Why when a body is immersed in liquid its weight tends to be reduced?
   - ✓ When a body is immersed in liquid it exerts an upward force on a body .This force tend to reduce the weight of a body

10. Explain why it is extremely so easy to raise a cargo in water but extremely very difficult to raise the same cargo in air?
    - ✓ It is easy to raise or lift anything in water because some weight is lost due to the presence of considerably upthrust in water, but in air it is not easy because the upthrust of air is very small, nearly negligible.

11. Briefly explain why a hole at the bottom of ship is more dangerous than one near the surface

- ✓ Because pressure is greater at bottom than at the surface.

12. Your young sister who is form one student at Mwembeni secondary school, opting physics subject.as form two student how would advise her continue taking physics subject?

Importance of physics

- ✓ *It help to acquire skill that are required in different professional like doctor, engineer and teachers*
- ✓ *It help to answer fundamental question about physics like how rainbow is formed*
- ✓ *It help to improve our technologies*
- ✓ *It help to know sources of energy like solar energy*
- ✓ *It help to manufacture and designing different equipment's that are used in transport and other activities like car, ship, house etc.*

SUSTAINABLE ENERGY SOURCE

1. Batholomeo is an expert environmental conservation. He was inverted by WEO of Mkongoro village to educate about the environmental effects of using charcoal as sources of energy but he did not attend the meeting. As a form two student use that vacancy to educate mkongoro villagers use three points
   - ✓ The effect of charcoal to our environment
     - (i) It change climatic condition
     - (ii) Deforestation
     - (iii) Destruction of ozone layer due to the production of carbon dioxide gas

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PHYSICS COMPETENCE BASED QUESTIONS WITH ANSWER FORM 1& 2

PHYSICS COMPETENCE BASED QUESTIONS WITH ANSWERS FORM 1 AND

ABOUT AUTHOR

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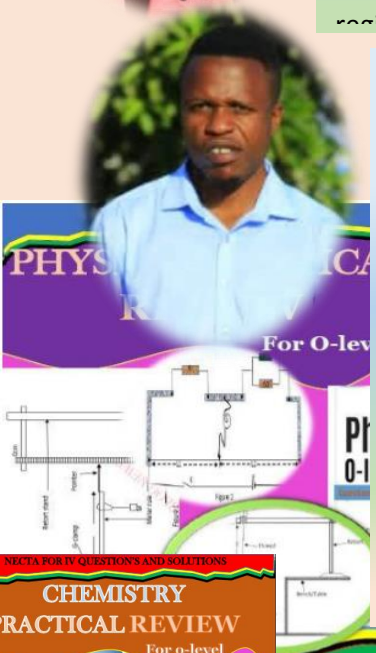

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OTHER BOOKS OF THE SAME AUTHOR

- PHYSICS COMPETENCE QUESTIONS WITH ANSWERS FORM 3 AND 4
- PHYSICS PRACTICAL REVIEW NECTA 2011-2022
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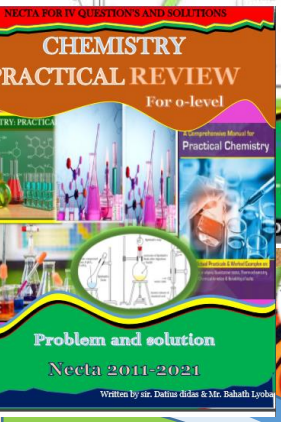

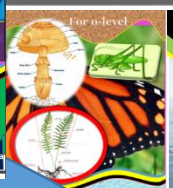

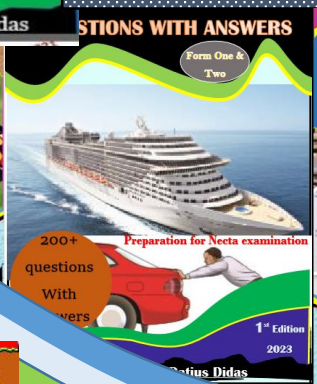

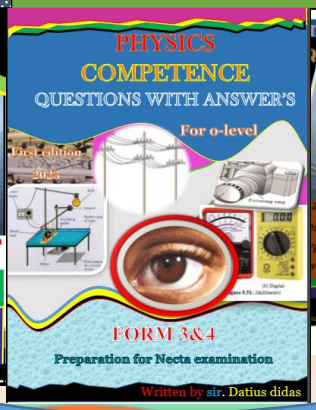

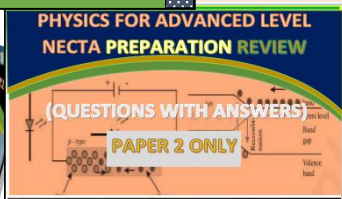

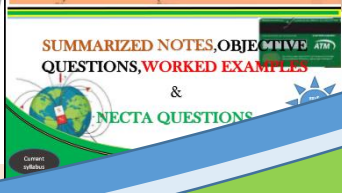

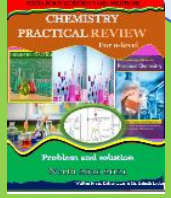

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