PHYSICS FORM TWO NECTA 2016.

Solutions from: Maktaba by TETEA

by Yohana Lozaro

1.

i	ii	iii	iv	v	vi	vii	viii	ix	x	xi	xii	xiii	xiv	xv	xvi	xvii	xviii	xix	xx
B	B	A	B	A	A	A	C	A	A	A	A	C	B	A	A	A	A	A	C

2.

i	ii	iii	iv	v
G	E	A	H	D

3.(i) hydrometer

(ii)simple machines

(iii)500000kg m/s

(iv)Plane mirror

(v)elastic material

4.(a)Moment of a force definition is - the product of the distance from the point to the point of application of the force and the component of the force .

(b): So if the distance from the hinge increases, the amount of force to be applied decreases. Hence, The handles of the door are placed at the end of doors.

(c)moment of force = force x perpendicular distance

= 48 x 1.5 = 72 NM

5.(a)The rate of change of the velocity of a particle with respect to time is called its acceleration. If the velocity of the particle changes at a constant rate, then this rate is called the constant acceleration.

Constant velocity means that the object in motion is moving in a straight line at a constant speed.

(ii)Momentum is mass in motion, and any moving object can have momentum. An object's change in momentum is equal to its impulse. Impulse is a quantity of force times the time interval. Impulse is not equal to momentum itself; rather, it's the increase or decrease of an object's momentum.

(b)examples of law on inertia in our daily life

-You tend to move forward when a sudden break is applied.

-You feel a backward force when the bus moves quickly from rest.

-Dusting bed with a broom removes dust due to inertia of rest.

-when you shake a branch the leaves get detached.

-Experiencing jerk when lift suddenly starts.

(c) distance, $v^2 = u^2 + 2as$

$30^2 = 0^2 + 2 \times 4.5 \times s$

Distance is 100 m

6.(a)(i)Pressure is the force acting on the body per area.

(ii)Atmospheric pressure, also known as barometric pressure (after the barometer), is the pressure within the atmosphere of Earth.

(b)- depth of liquid

-density of liquid.

(c) (i)pressure =density x height x g

= 1000 x 10 x 10

Pressure = 100000 N/m^2

(ii)area = 5 x 4 = 20 then,

Pressure = force/area

Force = 100000 x 20

= 2000000 N

7 (a) Newton's laws of motion

The first law states that an object either remains at rest or continues to move at a constant velocity, unless it is acted upon by an external force.

The second law states that the rate of change of momentum of an object is directly proportional to the force applied, or, for an object with constant mass, that the net force on an object is equal to the mass of that object multiplied by the acceleration.

The third law states that when one object exerts a force on a second object, that second object exerts a force that is equal in magnitude and opposite in direction on the first object.

(b)Inertia in a moving bus when the brake is applied But, the passenger tries to maintain the inertia of motion. As a result, a forward force is exerted on him. Hence, the passenger tends to fall back when the bus accelerates forward.

(c)Force = mass x acceleration

= Kg x m/s^2 = kg x m/s x 1/s

= kg x v x 1/s

So, v = Force/kg s^{-1}

= 2000÷0.5

=4000 m/s

8.(a)Archimedes' principle states that the upward buoyant force that is exerted on a body immersed in a fluid, whether fully or partially, is equal to the weight of the fluid that the body displaces.

(b)Relative density, or specific gravity, is the ratio of the density of a substance to the density of a given reference material.

(c)mass of liquid = 51 -15= 36 g

Volume =mass/density

= 36/1.2

Volume of bottle is 30 cm^3

9(a)(i)electric current is a stream of charged particles, such as electrons or ions, moving through an electrical conductor or space. It is measured as the net rate of flow of electric charge through a surface.

(ii)Coulomb, unit of electric charge.

(b)(i)In parallel,

R = R1R2/R1 + R2

= (5 x 5)/(5 + 5)

= 2.5 ohms

(ii) in series,

R = R1 +R2

= 5 + 5

= 10 ohms

(c)V1 = 5 x 2 = 10 v

-current at 10 ohms = 10V÷ 10 ohm = 1 A

Total current of circuit = 1A + 2A

= 3A

-total resistance = ((10 x 5/(10+5)) + 20 = 3.33 ohms

Total p.d, V = total current x total resistance

= 3A x 3.33 ohms

V = 9.9V = 10V

But V = V1 + V2

V2 = 2V

10.(a) Hydraulic press

(b)VR =R/r

= 500/20

=25

From, efficiency = VR/MA

MA = VR/efficiency

= 25/0.9

Mechanical advantage is 27.8