PHYSICS FORM ONE

MARKING GUIDE

SECTION A (15 marks)

1.

I	II	III	IV	V	VI	VII	VIII	IX	X
B	C	D	B	B	A	C	A	B	A

(10)

2.

I	II	III	IV	V
D	H	A	B	E

(05)

SECTION . B

3. (a) Mathematics Simplify physics laws. (02)

(b) (i) Short messages (SMS) @ 02 marks
(ii) Electronic mails (emails)
(iii) Fax messages
(iv) letters

4 (a) (i) Do not start open fires near buildings. (01)
(ii) No Smoking in prohibited areas. (01)
(iii) Do not interpere with electrical installations. (01)
(iv) All electrical appliances must be turned off immediately after use or before leaving the laboratory. (01)
(v) All Sources of heat should not be kept near the bench edges to prevent them from falling down easily. (01½)
(vi) All flammable Substances should be locked up in drawers or Cabinets. (01½)

(b) (i) Remove the fire extinguisher from the wall @ 01 mark
(ii) Hold the extinguisher upright and then remove the Safety pin
(iii) Direct the jet nozzle of the extinguisher at the base of the fire
(iv) Squeeze the handle so as to release the extinguishing agent.
(v) Sweep From Side to Side at the base of the fire Until

the fire is out.

5 (a) Vector quantities are those quantities that have both magnitude and direction While Scalar quantities are those quantities that have magnitude but have no direction. (03)

(b)(i) Close the jaws of the Vernier Calliper and look out for the zero cm (0cm) mark differences. @01 mark
(ii) Place the Object to be measured between the jaws
(iii) Slide the Vernier along the main Scale until it just touches the end of the Object.
(iv) Read and record the reading on the main Scale which is to the left of the zero cm mark of the Vernier Scale.
(v) Observe along the Vernier Scale and record the mark which Coincides with a mark on the main Scale.
(vi) Read and note down the value on the Vernier Scale.
(vii) Add the values in step 4 and 6 to get your Correct reading.

6 (a) Mass of water = 25g
Volume of water = $25cm^3$
Density of water = $\frac{25g}{25cm^3} = 1g/cm^3$
In kg/m^3, density of water = $1000kg/m^3$. (04)

(b) Mass of liquid X = 20g
Volume of liquid X = $25cm^3$
Density of liquid X = $\frac{20g}{25cm^3}$
$= 0.8g/cm^3$
In kg/m^3, density of liquid = $800kg/m^3$ (03)

(c) Relative density of
Liquid $X = \frac{800 g/cm^3}{1000 g/cm^3} = 0.8$

$= 0.8$ (03)

7 (a) A stem of hydrometer is made thin in order to allow greater change in height for every small change in density. (02)

(b) $W = \frac{P \times \%\ of\ V_d \times V_o}{100}$ (01)

Where:
W = Weight of the fluid displaced
V_o = Volume of the object
P = Density of the liquid
% of V_d = Percentage of the volume of liquid displaced
Then
Make P as the subject of the formula from the above equation

$P = \frac{100W}{\%\ V_d V_o}$ (01)

Since the density of mercury is larger than the density of water then;
(i) The volume of the displaced mercury will be smaller than the volume of the displaced water.
This is because density is inversely proportional to the percentage of volume of liquid displaced for constant weight and volume of an object. (03)

(ii) The weight of the mercury displaced will be larger than the weight of the water displaced.

This is because the density is direct proportional to the weight of the displaced liquid for Constant Volume of object and percentage of Volume of liquid displaced. (03)

8 (a) Physical phenomenon which indicates that liquid Surface appears to be in state of tension.

(i) Walking on water: Small insects Such as the water strider can walk on water because their weight is not enough to penetrate the Surface. Pond skater (water strider) floats in pond due to Surface tension. (01)

(ii) Floating a needle: A Carefully placed small needle can be made to float on the Surface of water even though it is Several times as dense as water. If the Surface is agitated to break up the Surface tension then needle will quickly Sink (01)

(iii) Razor floats over water: Due to Surface tension. (01)

(iv) Formation of Soap bubbles: Due to Surface tension. (01)

(v) Formation of drops of water on leaves of plant: Due to Surface tension. (01)

(vi) Washing with Cold water: The major reason for Using hot water for washing is that its Surface tension is Lower and it is a better wetting agent. (01)

(b) (i) Mercury from Convex (downward) meniscus because it possesses Strong Cohesive force than adhesive force. (01)

(ii) Water from Concave (Upward) meniscus (01)
because it possesses Strong adhesive force than Cohesive force.

(iii) Drop of water on the surface of different material is perfect sphere due to strong cohesive force than adhesive force. (01)

(iv) Water spread over glass because it possesses strong adhesive force than cohesive force. (01)

9 (a) Consider the formula of pressure in liquid

$$P = \rho g h$$ (01)

Where

P = The pressure in liquid
ρ = The density of the liquid
g = The acceleration due to gravity
h = The depth of the liquid

(01)

Since the acceleration due to gravity is constant ($g = k$) then:

(i) The depth of the liquid is direct proportional to pressure of the liquid $P \propto h$ (01½)

(ii) The density of the liquid is direct proportional to the pressure of the liquid $P \propto \rho$ (01½)

(b) "Any pressure exerted externally applied to the surface of an enclosed liquid will be transmitted equally throughout the liquid". 02 marks

The practical applications of law of transmission of pressure in liquid.

(i) Hydraulic press
(ii) Hydraulic brakes
(iii) Lifting a heavy load.

03 marks

10. (a) The law of Conservation of energy states that "Energy can neither be Created nor destroyed but can be transpered from one form to another" (03)

(b) Data given;

Mass of the rocket (m) = 13600kg
Time taken (t) = 1s
The distance moved by the fuel (d) = 1680m
Acceleration due to gravity g = 9.8N/kg
Power needed (P) = Unknown (01)

Solution.

The work were done necessary to lift the fuel is given by

W = Force (F) x distance (d) (01)

But

Force (F) = Mg (01)

F = 13600kg x 9.8N/kg

F = 133280N (03)

Then

W = 133280N x 1680m

W = 223910400 J = 2.24×10^8 J (02)

Work done by the pump to lift the fuel to 1680m be 2.24×10^8 J

Since the work done by the pump to lift the fuel to 1680m is equal to the work done by the pump to drive the fuel in to the Combustion chamber

Therefore

Power (P) = $\frac{W}{t}$ (01)

$P = \frac{2.24 \times 10^8 J}{1s}$

$P = 2.24 \times 10^8$ W

∴ The power needed to do this is 2.24×10^8 W (03)