Volume/cm³	Mass/g
2	16
3	25
4	32
5	38
6	48
7	56

a) Plot a graph of mass (along y- axis) against volume (along x – axis). **(10 marks)**

b) Determine the slope of graph and show how you determine the slope. **(3 marks)**

c) Determine the density of the steel. **(2 marks)**

END

PHYSICS I MARKING SCHEME

ORDINARY LEVEL NATIONAL EXAMINATIONS, 2016

1. a) Beam balance/electronic balance
   b) Vernier Calipers/micrometer
   c) Newton spring balance/Newton meter
   d) Measuring cylinder/graduated beaker.

2. a) False
   b) True
   c) False

3. a)

Speed	Velocity
- Distance covered in a unit time	- Distance covered in a unit time in a specific direction.
- Scalar quantity	- Vector quantity
- Distance travelled per unit time.	- Displacement per unit

3. b)
Distance travelled = speed×time
= 8m/s × 2 × 60 × 60
= 57600m = 57.6km

4. a) - It causes unwanted noise
   - It causes wear and tear
   - It causes unwanted heat
   - Reduction of efficiency of machine

b) - Ball bearings reduce friction between wheels and axles.
   - Wheels turn easily (or increase efficiency)

5. a) Force of gravity

b) $u = 20m/s$, $V = 0\ m/s$, $a = 10ms^{-2}$ and $t = t(s)$

$v = u + gt$, $o = 20m/s + (10m/s^2)t$

$t = \frac{20m/s}{10m/s} = 2s$

$h = u + \frac{1}{2}gt^2$

$h = 20 \times 2 - \frac{1}{2} \times 10 \times 2^2 = 40 - 20$

$= 20m$

6. a) $P = \frac{F}{A} = \frac{600N}{120cm^2} = 5N/cm^2$

b) The area in contact with the boy's body increases and hence the pressure decreases.

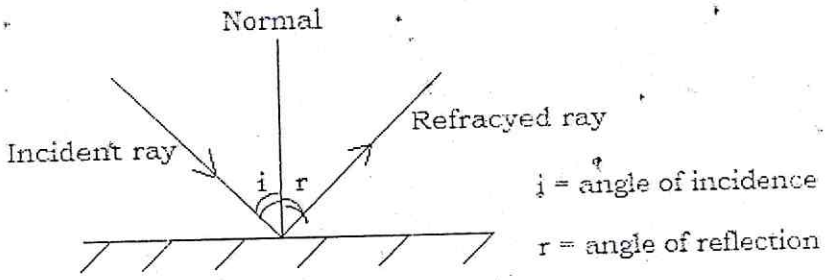
7.

a) 20°C = (273 + 20)k = 293K

b) When a liquid is heated it expands and becomes less dense and rises upwards.

c) Radiation is the flow of heat from one place to another by means of electromagnetic waves.

8.



8.

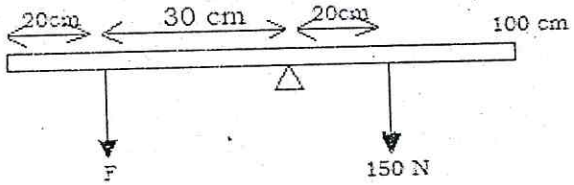
Charge on object A	Charge on object B	Force
Positive	Positive	Repel
Positive	Negative	Attract
Negative	Positive	Attract
Negative	Negative	repel

9. a) Equilibrium is the state of body where the sum of moments tending to turn the body clockwise round any point is equal to the sum of the moments tending to turn it anticlockwise.

b) A body in a neutral equilibrium returns in its initial position after being displaced slightly.

c)

diagram



$F \times 30cm = 20cm \times 150N$

$30F = 3000$

$F = 100N$

10. a) It states that a floating body displaces its own weight of fluid in which it floats.

b) - Sea water is denser than river water so the volume of sea water displaced by the ship is less than the river water displaced. So the ship sinks deeper into the river water.

11. a) Physical change

b) Chemical change

c) Physical change

d) Chemical change

13. a) Figure 2: brighter than normal
Figure 3: normal bright

b) i) Figure 2: cells are in series

ii) Figure 3: cells are in parallel

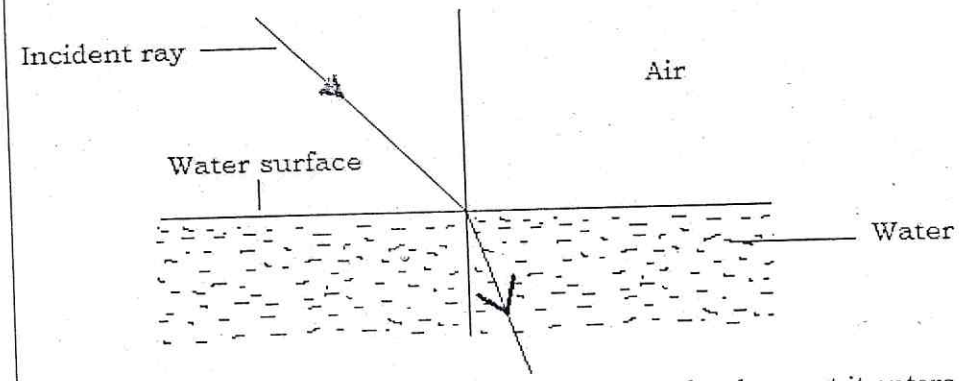
14. a)

Convex Lens	Concave lens
- Thinner at the edge and thicker in the middle. - Can give a real and virtual image. - Positive focal distance	- Thinner in the middle and thicker at the edges. - Gives only virtual image - Negative focal distance

b) i) Convex lens or converging lens
ii) Concave (Diverging) lens

SECTION B

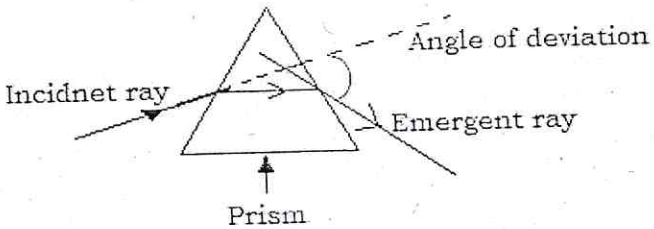
15. a)



The incident ray bends as it enters water. Its speed reduces at it enters water hence direction of the ray changes. Its refracted and bends towards he normal.

b) Dispersion of white light is splitting of white light into different colors which make up the white light.

c)



d) When it is about to rain or raining sunlight falls on the rain drops. Light is refracted hence spitting up into different colors, the colors of the rainbow.

16. a) It's the quantity of heat needed to change a unit mass from solid to liquid without change in temperature.

b) latent heat of fusion needed = m × L
= 10g × 340J/g
= 3400J

c) i) At any temperature

ii) - A higher temperature of the liquid: The higher the temperature, the greater the rate of evaporation.
- Area of exposed surface: Evaporation increases as the rate of water surface increases.
- The rate of removal of vapour: on a windy day, evaporation is faster.
- Nature of liquid
- Decrease in atmospheric pressure.
- Dryness of air in contact with liquid.

17. **a)** heating effect, chemical effect, lighting effect, magnetic effect, physiological (biological or electrocution effect).

b) i) The resistance of the filament increases when its temperature increases.

ii) A thin conductor wire.

c) The e.m.f. of a cell is the potential difference at its terminals when it's not connected to any resistance or apparatus.

d) Total resistance = $0.3 \times 2\Omega + 0.4\Omega = 1.0\Omega$

Total voltage = 3v

Current, $I = \frac{E}{R_t} = \frac{3v}{1.0\Omega} = 3A$.

18.

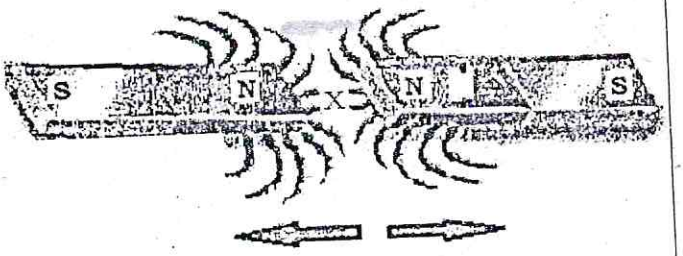
a) A magnetic material is a substance which can be magnetized or attracted by a magnet. E.g. Iron, cobalt, nickel.

b) induction, electrical method, stroking/contact.

d) The magnet is demagnetized or it loses its magnetic properties.

e) The bar magnet is suspended on a string, when it comes to rest, the north magnetic pole points to the north geographical pole of earth.

c)



X: neutral point

19. **a)** A uniform acceleration is the constant rate of change of increasing velocity of a moving body.

b) u = 10m/s, v = 20m/s, t = 5s

$a = \frac{v-u}{t} = \frac{20-10}{5} = 2m/s^2$

c) i) Retardation is the constant rate of change of decreasing velocity of a moving body.

ii) $a = \frac{v-u}{t} = \frac{(0-25)m/s}{20s} = 1.25m/s^2$

SECTION C: Teacher's guidance.