KANDARA SUB-COUNTY SECONDARY SCHOOLS
FORM 2 JOINT EXAMINATION

PHYSICS
Oct/Nov. 2015
MARKING SCHEME

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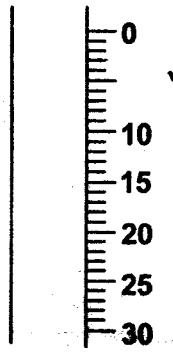
1. Volume of 1 drop $= \frac{4}{3}\pi r^3 = \frac{4}{3} \times 3.142 \times (0.5)^3$

vol. of 20 drops
$= \frac{4}{3} \times 3.142 \times 0.5 \times 0.5 \times 0.5 \times 20$ ✓
$= 10.4733$ ✓



✓1

New level = 30 - 10.5 ✓
$\simeq 19.5cm^3$ ✓

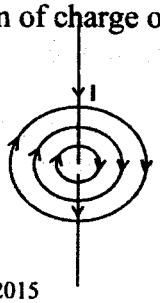
2. $P = 103000 + \rho gh$
$= 103000 + 1000 \times 10 \times 20$ ✓
$= 303{,}000N/m^2$ ✓

3. a) - image is inverted ✓
- image is real ✓
- formed on a screen ✓

b) magnification (m) = $\frac{\text{image dist.}}{\text{object dist}}$
$= \frac{20}{400} = \frac{1}{20}$ ✓
$\frac{\text{image height}}{1.6} = \frac{1}{20}$
image height $= \frac{1.6}{20} = 0.08m$ ✓

4. - testing whether a material is conductor or insulator ✓
- testing whether conductor is charged or not ✓
- testing sign of charge on a conductor ✓

5.



6. Volume of stone = 5 x 8 (13 - 9)
$= 40 \times 4$
$= 160cm^3$ ✓

Density of stone = $\frac{\text{mass}}{\text{volume}} = \frac{184g}{160cm^3}$
$= \frac{184 \times 10^{-3}}{160 \times 10^{-6}} = \frac{184 \times 10^3}{160}$
$= 1.15 \times 10^3 kg/m^3$ ✓

7. a) - a reduction in air pressure inside the tube
- excess atmospheric pressure forces liquid to rise up

b) Pressure from A $= \rho_A g h_A$
$= \rho_A \times 10 \times \frac{24}{100}$
Pressure from B $= \rho_B g h_B$
$= 1200 \times 10 \times \frac{16}{100}$
$\rho_A \times 10 \times \frac{24}{100} = 1200 \times 10 \times \frac{16}{100}$ ✓
$\rho_A = \frac{1200 \times 16}{24} = 800kg/m^3$ ✓

8. a) Pressure can be transmitted through a fluid equally without change ✓

b) - used in car brakes ✓
- used in hydraulic press ✓

c) Lung pressure = atm. pressure $+ \rho gh$
$= 101000 + 1000 \times 10 \times {}^{30}/_{100}$ ✓
$= 101000 + 3000$
$= 104000N/m^2$ ✓

9. i) Mass of fresh water = D x V
$= 1 \times 1600 = 1600g$ ✓
Mass of sea water = $1.25 \times 1400 = 1750g$
Total mass = 3350g ✓

ii) Total volume = $3000cm^3$
Density of mixture = $\frac{\text{mass}}{\text{volume}} = \frac{3350g}{3000cm^3}$
$\simeq 1.1167g/cm^3$ ✓

10. u = 10cm
f = 15cm
$\frac{1}{u} + \frac{1}{v} = \frac{1}{f}$

$\frac{1}{10} + \frac{1}{v} = \frac{1}{15}$ $\quad \frac{1}{v} = \frac{1}{15} - \frac{1}{10}$ ✓

$= \frac{2-3}{30} = \frac{-1}{30}$

v = -30cm ✓

ii) magnification = $\frac{v}{u} = \frac{30}{10} = 3$ ✓

iii) $\frac{\text{image height}}{\text{object height}} = 3$

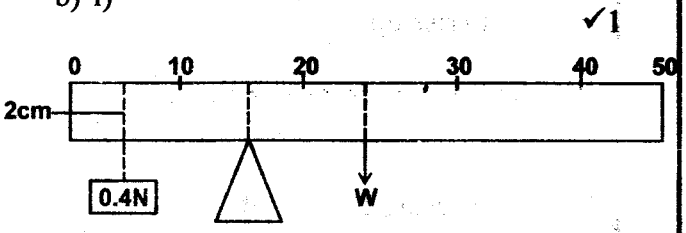
∴ image height = object height x 3 ✓

= 5 x 3

= 15cm ✓

11. a) moments is turning effect produced by a force ✓

b) i)



ii) 0.4 x 13 = W x 10 ✓

$W = \frac{0.4 \times 13}{10}$ ✓ = 0.52N ✓

12. a) Ice does not melt ✓

b) Water is a poor conductor of heat ✓

13. a) Like charges ✓ repel while unlike charges attract

b) i) It either gains electrons or looses electrons

ii) The end of brass-rod and the leaf have the same charges ✓ . Polythene makes the negatives and positives of electroscope to separate ✓✓

14. Volume of drop = $0.2772cm^3$

Volume of circular patch = $\frac{22}{7} \times \left(\frac{2.1}{10}\right)^2 h$ ✓

$\frac{22}{7} \times \frac{2.1}{10} \times \frac{2.1}{10} h = 0.02772$ ✓

= 0.2cm ✓

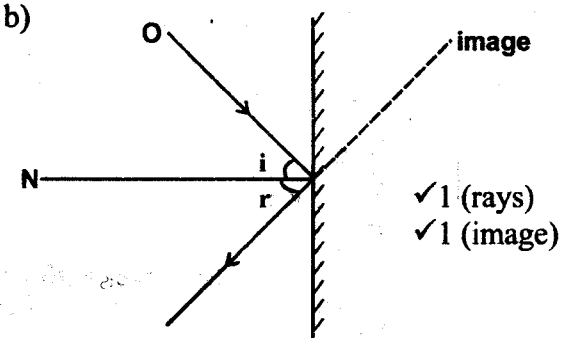
15. Local action defect ✓
- formation of hydrogen gas at the cathode
- formed due to pressure of impurities at cathode ✓

Polarization ✓ - formation of hydrogen gas at anode ✓

16. a) i) Angle of incident = angle of reflection ✓

ii) Incident ray, reflected ray and normal ray at the point of incidence all lie on the same plane ✓

b)

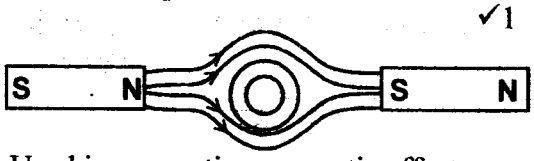


c) - image is laterally inverted ✓
- image is same size as object ✓
- image is same distance behind mirror as object is infront of mirror
(any two)

17. a) Brownian motion is random motion of particles in a liquid or in a gas ✓ ✓

b) Motion of smoke particles are caused by movement of molecules of air and collision of particles ✓

18. a) ✓1



b) Used in preventing magnetic effects on parts of a watch (anti-magnetic watches) ✓ (magnetic shielding)

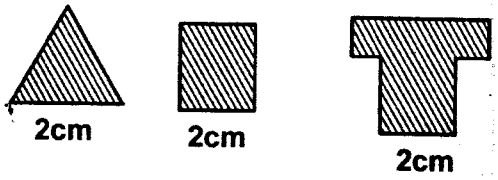
19. Mistakes made
i) Magnetising using an alternating current ✓
ii) Magnetising the bar facing East-West ✓

20. a) - stable equilibrium ✓
- unstable equilibrium ✓
- neutral equilibrium ✓

b) i) Luggage chamber are made at the base so as to lower centre of gravity for stability ✓

ii) Wider heavy base of stands makes bottom as wide as possible, lowers centre of gravity for maximum stability ✓

iii)



✓ (correct order only)

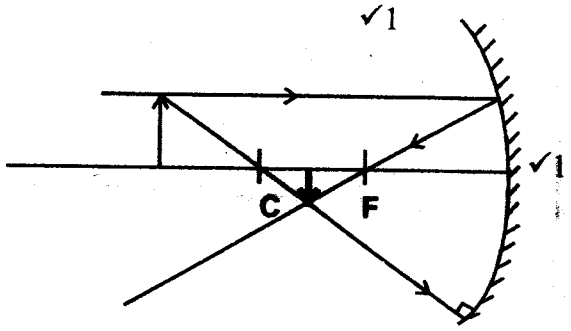
- factor used in arranging them is width of their tops ✓

21. 100°C represented by 5cm

1cm rep $\frac{100}{5}$°C

4cm rep $\frac{100}{5}$ x 4 ✓ = 80°C ✓

22.



Characteristics :

1. Image is real ✓
2. Image is inverted ✓
3. Image is diminished ✓

23. a) Sea breeze ✓

b) - sun heats both land and sea
- land becomes hot faster
- air molecules around the land are heated and rise up leaving empty space
- cold air moves from sea to land to go and occupy the empty space on land ✓ ✓ ✓

24. a) Energy changes

Chemical energy✓ → electrical energy✓ → sound energy ✓

b) Black is good absorbs of heat then white ✓✓

c) - conduction occurs as a result of vibration of molecules of solid
- molecules vibrate, collide with one another and so pass heat from one molecule to another ✓✓