**MWAKICAN JOINT EXAMINATION**

**PHYSICS FORM 2**

**TERM 1**

**YEAR 2014**

**MARKING SCHEME**

**SECTION A**

4

3

2

1

0

0

10

Check for correct drawing

Main scale 3.3 √

Vernier scale 0.06 √

1. Volume of water displaced = 100 – 60 = 40cm3

Volume of water displaced = Vol. of stone = 40cm3 √

$$P=\frac{M}{V}(do not award a mark for the formula)$$

$P=\frac{567g}{40cm^{3}}=14.175g/cm^{3}(correct substitution)$ √

$$P=14.18g/cm^{3}(Answer must be given correct to 2d.p)$$

1. Volume of drop = 5 x 10-8 M3
2. Area of circular film = 0.1M2

V = A x H

$$h=\frac{V}{A} √$$

$$Size of molecule=\frac{5 x 10^{-8}m^{2}}{0.1m^{2}}$$

$=5.0 x 10^{-7}m$ √

$$Accept 0.0000005$$

Check for correct units.

1. Atoms are spherical √

Mass uniformly distributes √

1. Weight on Earth = 600N

Weight on Planet = 450N

Weight, W = Mg

$$M=\frac{W}{g}$$

$Mass of body=\frac{600N}{10N/Kg}=60Kg$ √

$$g=\frac{w}{m}$$

$$g=\frac{450N √}{60Kg}=\frac{7.5N}{Kg}√$$

Correct substitution √

Correct answer with correct units √

1. The force of cohesion within the mercury is greater than the force of adhesion between mercury and glass √. The mercury therefore sinks down √the tube to enable mercury molecules to keep together√.
2. Temperature rise and impurities lower the surface tension of water √
3. a)

Check for correct drawing √

Check on the curvature √

b) The unbalanced √ surface tension√ pulls the thread tight

1. h = 760mm

p = 1.36 x 104 Kg/m3

p = ?

p = pgh

$$p=1.36 x 10^{4} x 10 x \frac{760}{1000}$$

Check on the conversion √

Correct substitution √

P = 103,360 N/M2

Accept P = 103,360 pa √ check for correct units

1. The external pressure (atmospheric) is lower than the internal pressure √: therefore the capillaries break √.
2. The bottle with hole experiment – if diagram used; check for labeling√: Procedure, observation and conclusion√.

√

Lowest jet has highest pressure

Liquid

1. Solid – particles very close, hence low kinetic energy√.

Liquids – particles fairly free, moderate kinetic energy √

Gases – particles very free, high kinetic energy √

1. The metal blade conducts heat from the hand but the wood cannot √

90 – 48 = 420 √

420

Drawing a normal

420

480

480

1. (20 x 0.3) + (20 x 0.3) √ or 20 x 0.6

6 + 6 = 12NM√

Check for correct units

1. Unlike poles attract while like poles repel√

Reject – unlike charges attract while like charges attract

Reject – unlike terms attract while like terms attract

1. 

Check for direction of field √

Check for presence of the neutral zone√

1. This is due to the influence of the Earth’s magnetic field√
2. Repulsion only occurs between 2 like poles√ but attraction may occur between 2 unlike poles or between a magnet and a magnetic materials√

**SECTION B**

1. i. Iron is a soft magnetic material it can easily acquire magnetism and can easily lose magnetism.
2. Check for correct direction

A B

1. A – North pole√

B – South pole √

1. Right hard grip rule√

It states that if a coil carrying current is grasped in the right hand such that the fingers point in the direction of current then the thumb points in the direction of North Pole√.

1. It would cause overheating on the electromagnet√. This adversely affects the magnetism of the electromagnet√.
2. i. Smoke particles – smoke particles are larger than air molecules and light enough to move when bombarded by air molecules √

Lens – focuses the light from the lamp on the smoke particles, causing them to be observable

Microscope – enlarges/magnifies the smoke particles so that they are visible √

1. Smoke particles more randomly/zigzag √

Air molecules bombard the smoke particles

Air molecules are in random motion

1. The speed of motion of smoke particles will be observed to be lighter/faster/speed increases√.
2. a) Principle of moments states that for a system in equillbrium, the sum of clockwise moments must be equal to the sum of the anticlockwise moments.

b)

6M

4.5M

65Kg

3M

C.O.G

1.5M

30Kg

Clockwise moments = Anticlockwise moments

300 x 1.5 = X x 650√ (correct substitution 1mk)

$$\frac{450}{650}=\frac{650x}{650}$$

$X=\frac{450}{650}$√

X = 0.69M√

c)

A

20cm

P

F1

F2

Q

30cm

B

100N

50

30cm

Taking moments about P

Distance between P and Q = 100 – (20 + 30)

 = 100 – 50√

 = 50cm

 = 0.5m

F2 x 0.5 = 0.3 x 100√

$$\frac{0.5 F2}{0.5}=\frac{30}{0.5}$$

$$F2=\frac{300}{5}=60N√ $$

Clockwise moments = Anticlockwise moments

F1 + F2 = 100N√

F1 + 60N = 100N

F1 = 100N – 60N

F1 = 40N√

1. a) Mass of water = 66.1 – 42.9√

= 23.2g√

$$b) Volume= \frac{Mass}{Density}=\frac{23.2g}{1g/cm^{3}}$$

= 23.2cm3√

Working must be shown

1. Volume of density bottle = volume of water

Volume of bottle = 23.2cm3√

1. Mass of soil = 67.2 – 42.9

= 24.3g √

1. Mass of water that filled the space above the soil

= 82.0 – 67.2

= 14.8g √

1. Volume of soil

Volume of water $=\frac{Mass}{Density}$√

$$=\frac{14.8g}{1g/cm^{3}}$$

 = 14.8cm3√

Volume of soil = 23.2 – 14.8

 = 8.4cm3√

1. The density of the soil $=\frac{Mass}{Volume}$

$=\frac{24.3}{8.4}$√

 = 2.893g/cm3√

1. a) A – Seal and insulator√

B – Zinc case√

C – Mixture of carbon and manganese (IV) oxide√

D – Carrbon rod √

1. Zinc case acts as a negative electrode√
2. i) Polarisation√

Remedy – Adding a depolarizer e.g potassium dichromate√

ii) Local action√

Remedy – By amalgamation√

Accept – use of pure zinc or coating zinc with mercury √