

TANZANIA HEADS OF ISLAMIC SCHOOLS COUNCIL
FORM TWO INTER ISLAMIC MOCK ASSESSMENT
PHYSICS

MARKING SCHEME JULY/AUGUST, 2026

1. 01 mark @

(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	(x)
C	A	A	B	A	D	NO ANSWER	C	C	A

2. 01 mark @

(i)	(ii)	(iii)	(iv)	(v)
C	D	A	B	E

3. (a) (i) Convex mirror (Diverging mirror) **01mark**
(ii) The mirrors are preferred because they form upright images which are smaller/diminished with wide field of view. **03 marks**

(b) Given data

$$\mu = 25\text{cm}$$

Size: If $h_o = h_i$, then $h_i = 2h_o$. (Image is larger twice as the object)

$$\text{Magnification } m = \frac{h_i}{h_o} = \frac{2h_o}{h_o} = 2$$

$$\therefore m = 2$$

01mark

$$\text{In turn; } m = \frac{v}{u}$$

$$2 = \frac{v}{25\text{cm}}$$

$$\underline{\underline{V = 50\text{cm}}} \quad \textbf{01mark}$$

We can now find focal length, f

$$\text{From } \frac{1}{f} = \frac{1}{u} + \frac{1}{v} \quad \textbf{01mark}$$

$$\frac{1}{f} = \frac{1}{25} + \frac{1}{50} = \frac{2+1}{50}$$

$$f = \frac{50}{3} \text{ cm} = 16.67 \text{ cm}$$

0 1mark

But: We need new μ , if image is 4 times the size of the object i.e. $v = 4u$

$$m = \frac{v}{u} = \frac{4u}{u} = 4$$

And; from $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$, use $v = 4u$

$$\frac{1}{16.67} = \frac{1}{u} + \frac{1}{4u} = \frac{4+1}{4u} = \frac{5}{4u}$$

$$\frac{4u}{5} = 16.67, \quad u = \frac{16.67 \times 5}{4}$$

$\therefore$ Object distance will be 20.84cm

02 marks

4. (a) Data given

Area of larger piston, $A = 0.0003 \text{ m}^2$

Area of smaller piston, $a = 2 \text{ cm}^2 = 2 \text{ cm}^2 \left(\frac{1 \text{ m}}{100 \text{ cm}} \right) \left(\frac{1 \text{ m}}{100 \text{ cm}} \right) = 0.0002 \text{ m}^2$. **01mark**

Force (f) applied in smaller piston = 120N

Required: Pushing up force (F) in larger piston

Pressure (P_s) exerted in smaller piston $\frac{f}{a}$ **(00 ½ mark)**

Pressure (P_L) exerted in larger piston $\frac{F}{A}$ **(00 ½ mark)**

From Pascal's principle : $P_s = P_L$ **01 mark**

$$\text{From } \frac{f}{a} = \frac{F}{A}$$

$$f = \frac{Af}{a} \quad \textbf{01mark}$$

$$= \frac{0.0003 \text{ m}^2}{0.0002 \text{ m}^2} \times 120 \text{ N} \quad \textbf{01mark}$$

$$F = 180 \text{ N}$$

(b) Given data

Initial length of spring $L_0 = 16.0\text{cm}$

i.e. extension , $e = 20\text{cm} - 16\text{cm} = 4\text{cm} = 0.04\text{m}$ **(00 ½ mark)**

Weight (force) = 5.0N

Required: Length when weight = 6N

From Hooker's Law

$F = KE, E = F/K$ **(00 ½ mark)**

$K = F/e = 5.0\text{n}/0.04\text{m} = 125\text{N/n}$ **01mark**

Again when force changes:

$e = F/K = \frac{6.0\text{N}}{125\text{ N/m}} = 0.048\text{m} = 4.8\text{cm}$ **01mark**

Then, the length of the spring will be:

$L_0 + \text{new "e"} = 16\text{cm} + 4.8\text{cm}$ **01mark**

$= 20.8\text{cm}$ **01 mark**

5. (a) The reason behind is all orbit the concept of the surface tension. The surface tension in hotter soup is low due to the forest that surface tension of liquid decreases with an increase in temperature the low surface tension allows hotter soup spread quickly over larger area of the tongue and faster better. **04 marks**

(b) It is well known that work done = fore x distance. **01mark**

When the box is lifted vertically,

Workdone = Gain in gravitational potential energy **01mark**

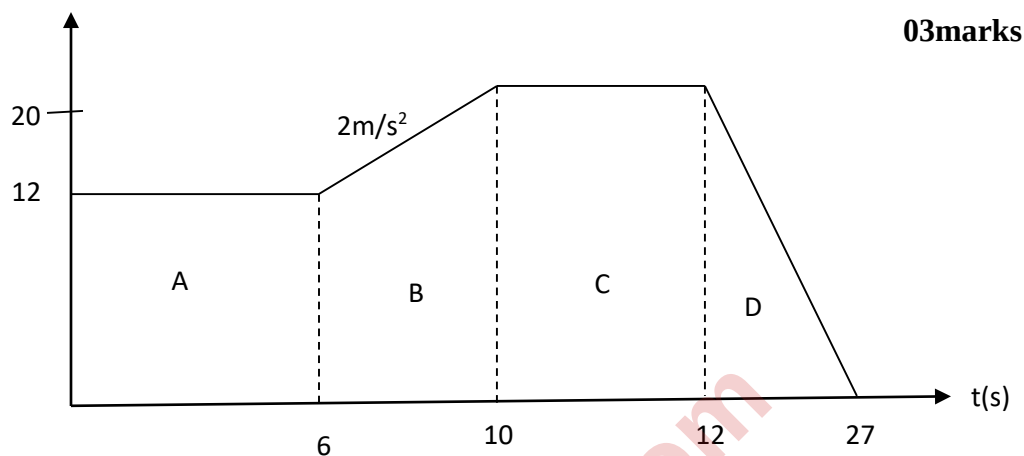
When pushed on a rough floor, work done against friction. Energy is lost as heat due to friction. **01mark**

Therefore, more work is done when pushing the box on a rough surface. **01mark**

(c) Is the process of directing the magnetic field lines **02 marks**

6. From forming information into a graph

(a) Vm/s



Required the graph (✓)

(b) Distance = Area under the graph
 = Length x width
 = 12m/s x 5 seconds
 S = 60m

03marks

(c) Average velocity = $\frac{\text{Total distance}}{\text{Total time}}$

Total distance = Total Area under the graph

= Area A + area B + area C + area D)

But, $\frac{u-v}{t} = a$, we can calculate highest velocity reached.

$$\frac{v - u}{t} = a$$

$$\frac{v - 12\text{m/s}}{4\text{s}} = 2\text{m/s}^2$$

$$V = 12\text{m} + 4\text{s}(2\text{m/s}^2)$$

$$= 12\text{m/s} + 8\text{m/s}$$

$$= 20\text{m/s}$$

01mark

$$\text{Area A} = 12 \times 6 = 72\text{m} \quad \text{(00 ½ mark)}$$

$$\begin{aligned} \text{Area B} &= \frac{1}{2}(a + b)h \\ &= \frac{1}{2}(12 + 20)4 \\ &= 2 \times 32 = 64\text{m} \end{aligned} \quad \text{(00 ½ mark)}$$

$$\text{Area C} = (20 \times 20)\text{m} = 40\text{m} \quad \text{(00 ½ mark)}$$

$$\text{Area D} = \frac{1}{2}bh = \frac{1}{2} \times 15 \times 20 = 150\text{m} \quad \text{(00 ½ mark)}$$

$$\text{Total Area} = \text{Total distance} = 72\text{m} + 64\text{m} + 40\text{m} + 150\text{m} = 326\text{m}.$$

$$\therefore V = \frac{362\text{m}}{275} = 12.1\text{m/s} \quad \text{01mark}$$

7. (a) (i) Refraction of light 01 mark
 (ii) Change [decrease] in speed of light as it passes from air to water since water is denser than air 03marks

- (b) (i) Given data

$$\text{Density } (\rho) \text{ of mercury } (\rho = 13,600\text{kg/m}^3)$$

$$\text{Change in height } (\Delta h) = 0.25\text{m}$$

$$\text{Atmospheric pressure} = 1.0 \times 10^5\text{Pa}$$

$$\text{Required: Change in pressure } (\Delta P)$$

$$\text{From } p = \rho gh$$

$$\text{Thus } \Delta P = \rho g \Delta h \quad \text{01mark}$$

$$= 13600\text{kg/m}^3 \times 10\text{N/kg} \times 0.25\text{m}$$

$$\Delta P = 34000\text{Pa} = 3.4 \times 10^4\text{Pa} \quad \text{02marks}$$

- (ii) Absolute Pressure

$$\text{Recall: } \Delta P = P_1 - P_2, \text{ Thus } P_1 = \Delta P + P_2 \quad \text{01mark}$$

$$\therefore \text{Absolute Pressure } (P_1) = \text{Atmospheric Pressure} + \text{Change in Pressure}$$

$$= 1.0 \times 10^5\text{Pa} + 3.4 \times 10^4\text{Pa}$$

$$= (1.0 \times 10^5 + 0.34 \times 10^5)\text{Pa}$$

$$= 1.34 \times 10^5\text{Pa} \quad \text{02marks}$$

8. (a) (i) Optical Instruments used by astronomers and Jeweler. **02marks**

- Telescope – used by astronomer
- Microscope or magnifying glass-used by Jeweler

(ii) Reasons **(02 marks)**

- Telescope: observe distant celestial objects
- Microscope; magnifies small objects
- Projector

(iii) Uses **(02 marks)**

- Photography
- Medical examination (eye, laboratory)

(b) Data given

Focal length of objective (f_o) = ?

Focal length of eye piece (f_e) = ?

Length (L) = 78cm

Angular magnification = 15

From

$$L = f_e + f_o$$

$$f_e + f_o = 78 \dots\dots\dots (i) \quad \mathbf{01mark}$$

$$M = \frac{f_o}{f_e}$$

$$f_o = M f_e$$

$$f_o = 15 f_e \dots\dots\dots (ii) \quad \mathbf{01mark}$$

Substitute eqn (ii) into (i)

$$f_e + 15 f_e = 78.$$

$$16 f_e = 78$$

$$f_e = 4.9 \text{cm} \dots\dots\dots \mathbf{01mark}$$

then

$$f_o = M f_e$$

$$f_o = 15 \times 4.9$$

$$f_o = 73.1 \text{cm} \dots\dots\dots \mathbf{01mark}$$

9. (a) When a body is partially or totally immersed in a fluid it experience an upthrust equal to the weight of the fluid displaced. **04marks**

(b) Solution

$$W = T + u \quad \mathbf{01mark}$$

$$T = w - u$$

$$T = mg - \int vg$$

$$T = mg - \int_{oil}.Vi.g$$

$$Vi = \frac{360g}{7.89/cm^3} = 45.62cm^3$$

$$\text{Volume of Iron piece (Vi)} = 45.62cm^3 \quad \mathbf{01mark}$$

(c) For halfway submerged $\frac{Vi}{2} = \frac{46.2}{2} = 22.81cm^3$ **01mark**

From the equation above

$$T = mg - \int_{(oil)}.Vi.g \quad \mathbf{01mark}$$

$$T = (360g \times 0.01N/g) - (0.9g/cm^3 \times 22.81cm^3 \times 0.01N/g) \quad \mathbf{01mark}$$

$$T = 3.6N - 0.2N \quad \mathbf{01mark}$$

$$T = 3.39N$$

$$\text{Tension in the string Is } 3.39N \quad \mathbf{01 mark}$$

10. Data given

$$\text{Current (I)} = 10A$$

$$\text{Voltage (V)} = 120V \quad \mathbf{01mark}$$

(i) Power (P) = ?

From

$$\text{Power (P)} = IV \quad \mathbf{00 \frac{1}{2} mark}$$

$$= 10A \times 120V \quad \mathbf{01 mark}$$

$$P = 1200W \quad \mathbf{01mark}$$

(ii) Energy in Joules

From

$$H = Itv \quad \mathbf{00 \frac{1}{2} mark}$$

time (t) = 5 hours

$$H = 10A \times 5 \text{ hrs} \times 120V \times 3600 \quad \mathbf{01 mark}$$

$$H = 21,600,000J \quad \mathbf{01mark}$$

- (b) Resistance of a wire is directly proportional to the length of a wire ($R \propto l$) **01mark**

Resistance of a wire is inversely proportional to cross sectional area $R \propto 1/A$. **01mark**

Since X is very long and thin while wire Y is short and thick, then wire X has higher resistance than wire Y. **02marks**

- (c) Data

$$\text{Emf}(E) = 12\text{V}$$

$$(r) = 1.5\Omega$$

$$R = 4\Omega$$

Required: Total resistance of the circuit R_T .

(i) $R_T = R + r$
 $R_T = 4\Omega + 1.5\Omega$
 $R_T = 5.5\Omega$

01mark

(ii) Current through the battery
 $E = IR_T$
 $I = E/R_T$
 $I = \frac{12\text{V}}{5.5}$
 $I = 2.2\text{A}$

02 marks

(iii) P.d across the cell terminals
 $V = IR$
 $= 2.2 \times 4$
 8V

02 marks