(1) THE PRIME MINISTER'S OFFICE
REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT
FORM FOUR LAKE ZONE MOCK EXAMINATION

PHYSICS 1 PROPOSED MARKING GUIDE

1

(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	x
C	B	E	A	C	E	A	A	D	E

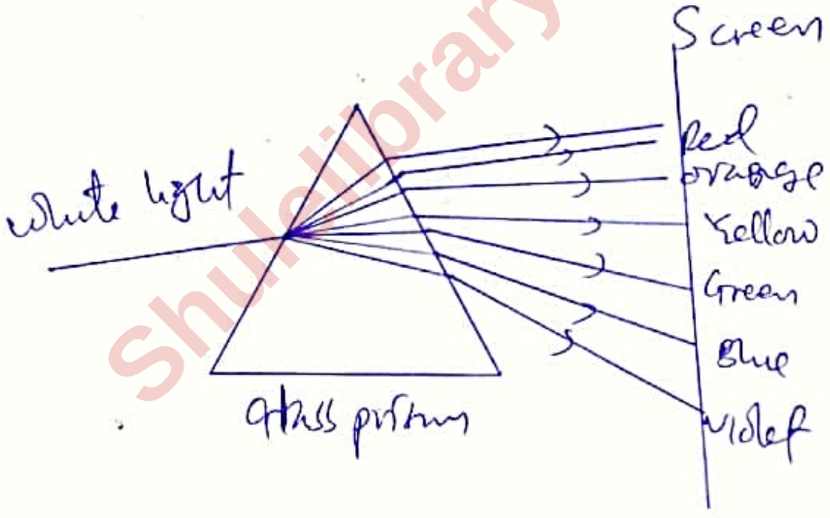
@ 1marks

2

(i)	(ii)	(iii)	(iv)	(v)	(vi)
D	I	G	A	C	F

@ 1marks

3 (a)



05 Marks

(b) Given

$f = 10cm = 0.1m$, $u = 11m$, $M = ?$ — 01

$$M = \frac{f}{u-f} = \frac{0.1}{11-0.1} = 0.009$$ — 01

$\therefore M = 0.009$ — 02

4 (a) Let the volume of woman = V_1

volume of submerged body of woman = V_2

density of woman = ρ_m

density of water = ρ_w — 01

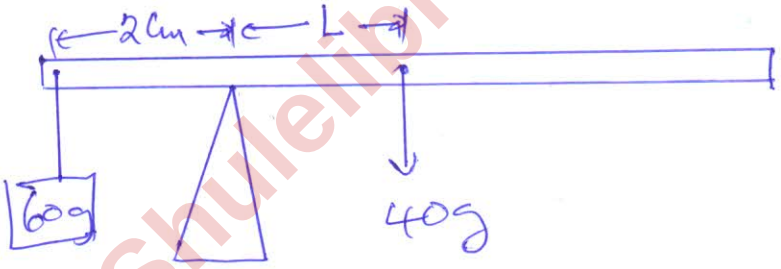
From

$$\frac{V_1}{V_2} = \frac{\rho_w}{\rho_m}$$ — 01

$$\rho_m = \left(\frac{V_2}{V_1}\right)\rho_w = \frac{0.97V_1}{V_1} \times 1000$$ — 01

$$\therefore \rho_m = 970\ kgm^{-3}$$ — 02

(b)



— 01

clockwise moment = Anticlockwise moment

$$40 \times 9.8 \times L = 60 \times 2 \times 9.8$$ — 01

$$L = \frac{120}{40} = 3cm.$$

Since the $\frac{1}{2}$ length of a pencil is $L + 2cm = 5cm$

Its full length will be 10 cm. — 02

5 (a) When a butt is held loosely, the recoil ~~velocity~~ mass is just the mass of the gun but when held tightly the recoil mass will be mass of the gun plus mass of the man thus the recoil velocity get reduced. ——— 04

$$V_{recoil} = \frac{M_{bullet} \times V_{bullet}}{M_{recoil}}$$

(b) Given

Mechanical advantage (M.A) = 8

Effort (E) = 200N.

load (L) = ? ——— 01

From

$$M.A = \frac{L}{E} \Rightarrow L = M.A \times E$$ ——— 01

$L = 8 \times 200 = 1600\,N.$

But the efficiency is only 80%, therefore ——— 01

$L = \frac{80}{100} \times 1600 = 1280\,N.$ ——— 02

6 (a) Device B is a cooler

The linear expansivity of aluminium is higher than that of steel so when heat causes the bimetallic strip bends towards B and turn ~~off~~ ON the device B in order to cool the room. 05

(b) Given

$m_1 = 105\,g$

$m_2 = 215\,g$

$\theta_1 = 75^\circ C$

$\theta_2 = 15^\circ C$

$\theta = ?$ 01

From

$m_1 c_1 \Delta\theta_1 = m_2 c_2 \Delta\theta_2$

$m_1 c_1 (\theta_1 - \theta) = m_2 c_2 (\theta - \theta_2)$

$$\theta = \frac{m_1 c_1 \theta_1 + m_2 \theta_2 c_2}{m_1 c_1 + m_2 c_2}$$ 01

$$\theta_2 = \frac{105 \times 75 + 215 \times 15}{105 + 215}$$

$\theta_2 = 34.7^\circ C$ 02

7 (a)

Given

Maximum Current (I) = 10A

Total power (P) = 1975W

Power supply (V) = 240V ——— 01

from

$$I = \frac{P}{V} = \frac{1975}{240} = 8'22A$$ ——— 02

The fuse will not blow OFF since the current flowing is less than the maximum current that must not be exceeded. ——— 02

(b)

Given

Half life (T) = 8 days

original mass (m_0) = 16g

Time (t) = 20 days ——— 01

Remaining mass, m = ?

from

$$m = m_0 \left(\frac{1}{2}\right)^{t/T}$$ ——— 01

$$m = 16 \left(\frac{1}{2}\right)^{\frac{20}{8}} = 2'83g$$

$\therefore m = 2'83g.$ ——— 02

8 (a) The inner core is at very high pressure compared to the outer core which raises the melting point of the material inside the inner core. — 04

(b) The moon's gravity pulls water on the side of the earth closest to it, forming a bulge of water, this is termed as high tides. On the opposite side the earth, another bulge forms due to inertia of the earth. Areas between the bulge experiences low tides. — 04

9 (a) (i) From

$C_T = C_1 + C_2$ — 01

$C_T = 0.3 + 0.6 = 0.9\ \mu F$ — 02

(ii) From

$Q = CV$

$Q = 0.6 \times 10^{-6} \times 3 = 1.8 \times 10^{-6}\ C$ — 01

$\therefore Q = 1.8 \times 10^{-6}\ C$ — 01

9 (b) For it to be measure of accurately the ammeter should have very low resistance (zero) while voltmeter should have very high resistance (infinite). Practically this is not possible since an ammeter have some resistance while the resistance of a voltmeter is not infinite. 03

(c) (i) When sound from vibrating source enters a tube containing air ~~column~~, the air column inside the tube ~~can~~ can vibrate strongly at a certain lengths. The strong vibration is known as resonance. 03

(ii) From

$$f = \frac{v}{\lambda} \quad 01$$

But $\lambda = 2(L_2 - L_1) = 2(0.47 - 0.22)$ 01

$$\lambda = 0.5\ m.$$

$$f = \frac{340}{0.5} = 680\ Hz. \quad 02$$

10 (a) (i) Geiger - Muller tube is a device used to detect ionizing radiations such as alpha, Beta and gamma rays. It converts radiation into electrical signals so that the radiation can be detected and measured. 02

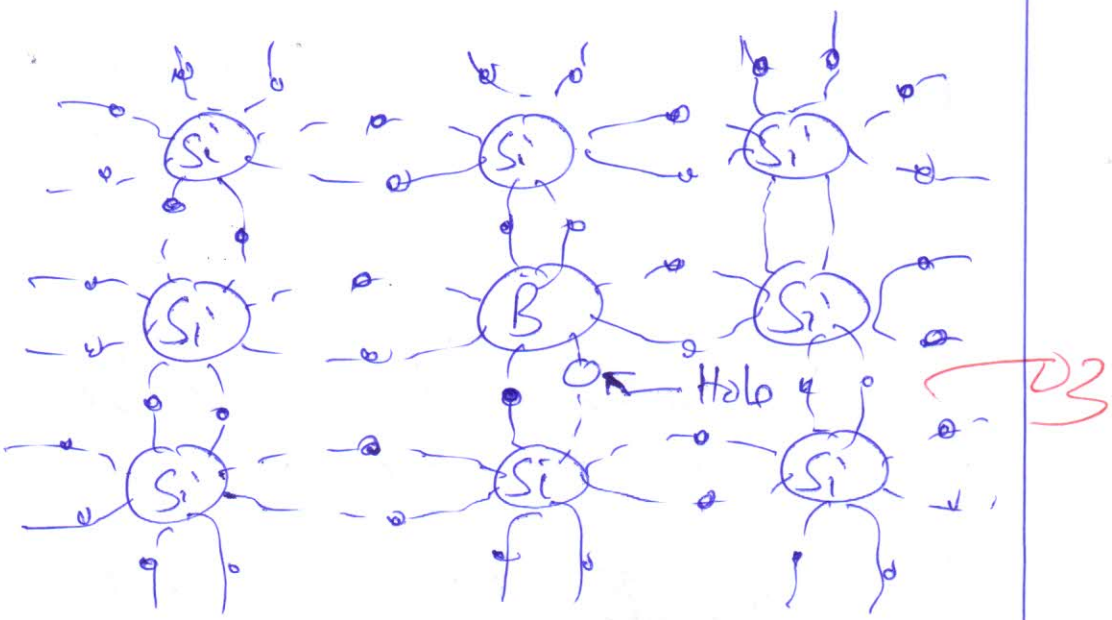
(ii) This is a sealed chamber containing super saturated alcohol used to detect radiation. When radioactive particles pass through the chamber, they ionize the air and cause the vapour to condense into the droplets, forming the visible tracks. 02

(b) –

CONDUCTOR	SEMICONDUCTOR	INSULATOR
Has no forbidden gap	narrow forbidden gap	wide forbidden gap
02	02	02

06

(c) In order to produce p-type semiconductor, trivalent dopants are added to a pure semiconductor. This creates extra holes and make the crystal to become positively charged due to having holes as majority charge carrier. 02



03

11 (a) from

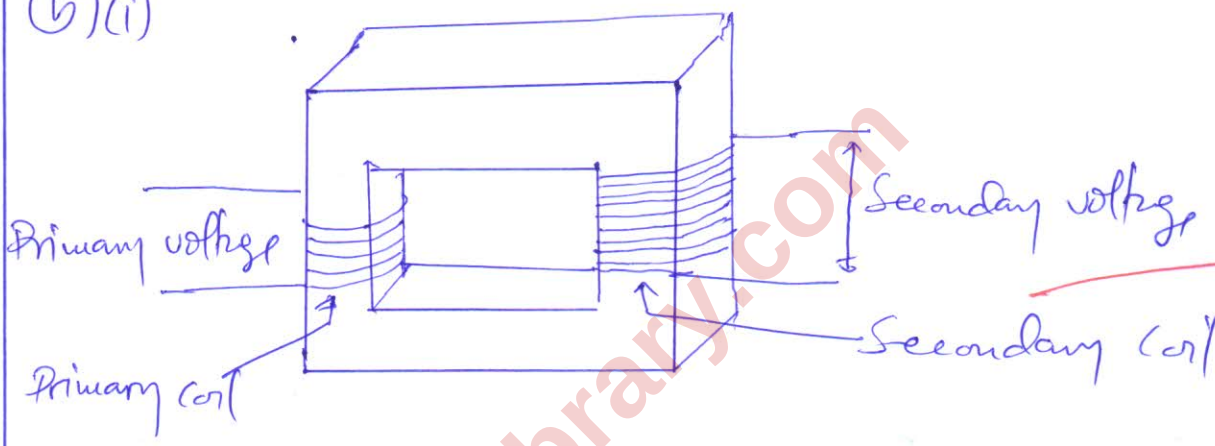
$D = ut$

depth $d = \frac{D}{2}$ ——— 01

$\Rightarrow d = \frac{ut}{2} = 1500 \times \frac{1}{2} = 750\ m$ ——— 01

$\therefore$ depth $= 750\ m$ ——— 02

(b)(i)



——— 02

The secondary coil has more number of turns than the primary coil, so the induced emf become larger. ——— 03

$$\frac{V_S}{V_P} = \frac{N_S}{N_P}.$$

(c) (i) Nothing happens since d.c signal cannot be altered by a transformer. ——— 02

(ii) Because the secondary draws current to ring the bell and the transformer must supply this power through the primary coil. ——— 04