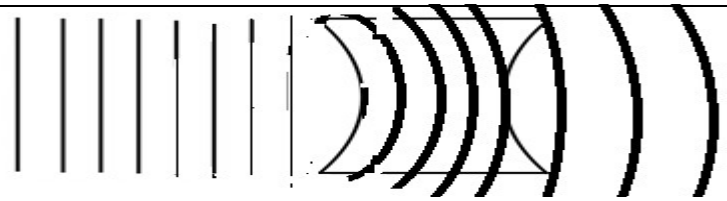
LAIKIPIA EAST TERM 2 2022 FORM 4 EVALUATION EXAM

Kenya Certificate of Secondary Education – K.C.S.E

PHYSICS 2022
PP 2

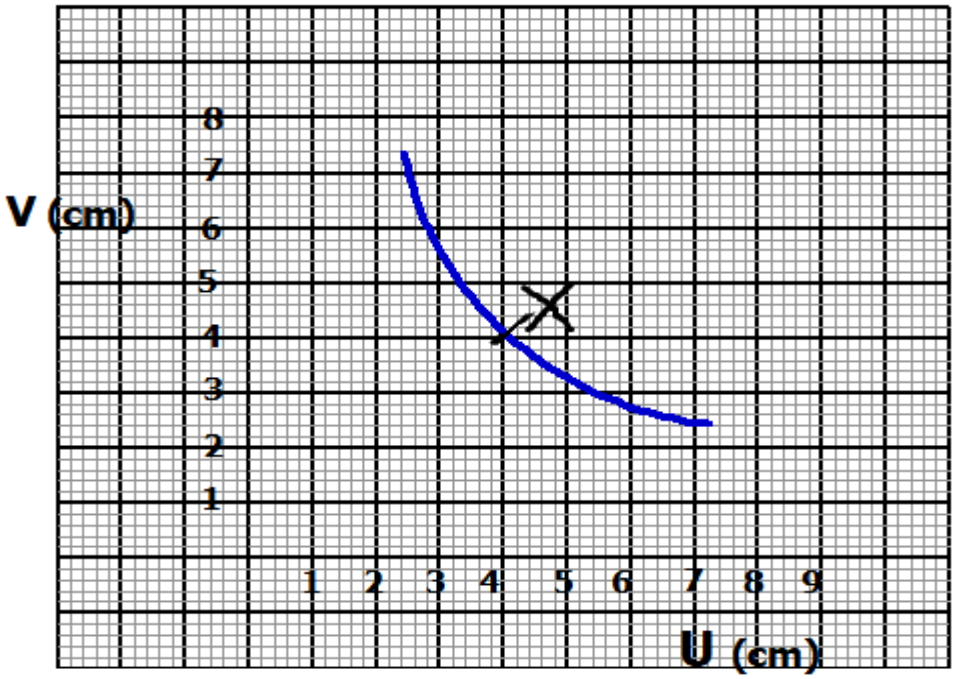
MARKING SCHEME

No.	MARKING SCHEME	NOTES
1	Angle of incidence = angle of reflection =0	1
2	i. Contact method ii. **If the rod is brought closer, the negative charges will be induced at the cap while the positive charge will be repelled to the plate. If the rod now touches the cap**, it neutralizes the negatives charges , If it is withdrawn, **the positive charge will be more in the electroscope** hence charged positively	1 1
3	Q= CV $C_T = \frac{40 \times 20}{40+20} = 13.33\mu F$, Q= 13.13 X 24=320 μC $V = \frac{320\mu C}{20\mu F} = 16V$	1 1 1
4	a) P It takes a **shorter time** to be achieve magnetic saturation as compared to Q	1 1
5	Q=It, Q= 2A x 2.5 x 60=300 C Number of electrons=300C/1.6 x10 $^{-19}$C =1.875 x 10^{25}electrons	1 1 1
6	When the bulb is at the Centre of curvature, it produces a stronger parallel beam that travels longer distance.	1
7	It penetrates deepest It is easily reflected	1 1

8	Angle 46.46°(must be measured directly from the diagram) $n=\frac{1}{\sin\theta}$ $n=\frac{1}{\sin 46.46}=1.50$	1 1 1
9	Sound wave	1
10	Provide an inert atmosphere to prevent the oxidation of the filament	1
11	Produce a magnified real image of the object	1
12	-By increasing the area of the overlap -By decreasing the distance between the plates -By using a dielectric material	1 1 any two correct respons e
13	$E=V+Ir$	1
14		1 for reduced waveleng th inside 1 mark for curved wave fronts outside but equal waveleng th as before the lens
15	a). a thin wire has got more resistance to the flow of current as compared to the copper leader hence produces a higher heating effect than copper leads b) i) Electrical energy → heat energy+ Light Energy ii) being made of material of high melting point, it withstand the high temperature inside the filament bulb c (i) V=IR I = 240/950 = 0.2526 A ii) P = VI 240 x 0.2526 60.624W	

(iii) E=Pt
= 60w x2 x 3600sec
=432000J

16



(i) Indicated on the diagram

(ii) When V=U=4cm,then,Radius of curvature ,r , =4cm(object at Image is also at C

iii) $\frac{1}{}=\frac{2}{}$,

$$\frac{1}{v}=\frac{1}{f}-\frac{1}{u}=\frac{1}{1.2}-\frac{1}{1.8}\ \frac{1}{v}=0.2778, v=3.6cm$$

$$u_o=d-v$$

$$\frac{1}{d-3.6}=\frac{1}{2.8}-\frac{1}{10}$$

$$d-3.6=3.8889$$

$$d=7.489cm$$

iv)

$$u=12cm$$

$$v=-36cm \qquad f=\frac{uv}{u+v}$$

$$\frac{12\,x-36}{12-36}=\frac{432}{24}=+8cm$$

17	a) (i) Quantity of current (ii) Shape of the electro magnet (iii) Number of turns per unit length on the solenoid (iv) Length of the solenoid (v) Type of material of the solenoid b) (i) Soft iron since it and easily magnetized and demagnetized (ii) B- south pole C) I)When the switch is closed, the magnetic field builds up to maximum in the primary coil inducing a current in secondary coil. When the current is maximum, there is no change in magnetic flux. When the switch	

Is open, the magnetic flux changes again inducing current in the secondary coil but in opposite direction

d)

18. a(i) Sound waves are mechanical in nature while radio waves are electromagnet
Sound waves are longitudinal while radio waves are transverse
Sound waves requires a material medium for transmission while radio waves do not require

ii) $S = \frac{1}{2} vt$, $S = \frac{1}{2} \times 320 \times 4.5s = 720$, hence $X = 400 + 720 = 1120m$

iii)(I)

Ultraviolet rays	X – rays
Microwaves	UV – Rays
X-rays	Visible light
Visible light	microwaves

(II) i) Ultraviolet rays: detect forgeries, mineral analysis, vitamin D etc

ii) Microwaves: cooking, communication

b (i) A bright fringe
(ii) loud sound
c) (i) To absorb heat energy produced after electrons are suddenly stopped

(ii) Has a high melting point

(iii) Electrons accelerated are suddenly stopped by the target and some energy is converted to x ray

19. (i) product/sum +all series

(ii) $Re = \frac{(15 \times 10)}{(15+10)} + 3.5 + 0.5 = 10\Omega$

(iii) I= v/r = 2.1/10 = 0.21A

(iv) Voltage across the $3.5\Omega = 0.21A \times 3.5\Omega = 0.735V$

Voltage across the parallel=2.1v-0.735v=1.365V

Hence current across $10\Omega = I = \frac{V}{} = \frac{1.365V}{10} = 0.1365A$

d) (i) Emf is the voltage intercept=1.5V

(ii) slope =r

Points,(0,1.5), (4.5,0.5), $r = 1/4.5 = 0.22\Omega$

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