KAKAMEGA CENRAL SUB-COUNTY JOINT EVALUATION EXAMS

231/3

PHYSICS

PAPER 3

PRACTICALS

JULY/AUGUST

CONFIDENTIAL INSTRUCTIONS TO SCHOOLS

-The information contained in this paper is to enable the head of school and teacher in charge of physics to make adequate preparations for this year's physics mock practical examination. NO ONE ELSE should have access to this paper or acquire knowledge of its contents. Great care must be taken to ensure that the information herein does not reach the candidates either directly or indirectly.

-The physics teacher is NOT expected to perform the experiments

- The apparatus required by each candidate for the physics mock practical examination are set out on the next page. It is expected that the ordinary apparatus of a physics laboratory will be available.

- The physics teacher should note that it is his/her responsibility to ensure that each apparatus acquired, for this examination agrees with specifications on the next page.

Question 1.

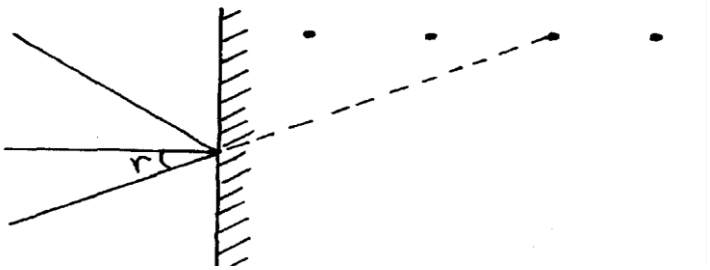
- A retort stand, boss and damp
- Test tube
- Piece of duplicating paper
- A thermometer
- Large beaker containing some water
- A tripod stand and wire gauze
- A cardboard with a hole in the middle
- Source of heat (burner)
- Rubber band
- Stopwatch

Question 2.

- Two dry cells (size D)
- A voltmeter.
- An ammeter.
- Resistance wire mounted on amm scale
- 9 connecting wires (3 with crocodile clips)
- A two cell holder (or two single cell holders)
- A micrometer screw gauge-shared
- Switch

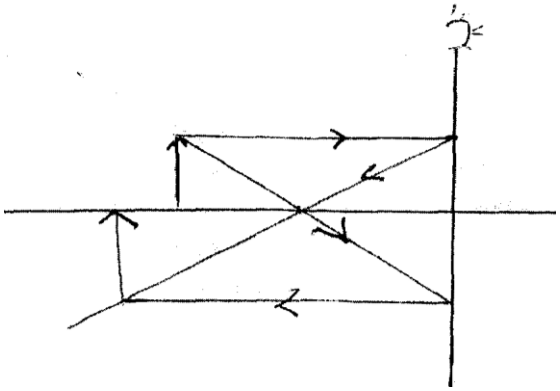
KAKAMEGA CENTRAL SUB-COUNTY JOINT EVALUATION EXAMS
PHYSICS 232/2
MARKING SCHEME

1.



2. (i) - Real - Inverted
(ii) The size of the image increases.

3 .



4. - Increase the current
- Increase the number of turns per unit length / increase windings
- Use of a U-shaped core.

5. - The keeper is magnetized.
- This makes the dipoles to form a closed ioop.

6. K.E ⟶ Heat + X-rays

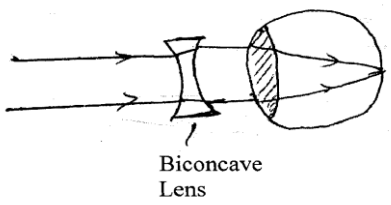
7. $E=1^2RT$
$= 13^2 \times 8.5 \times 1.5 \times 60$
$= 1.293 \times 10^5 J$

8. To avoid explosion because of the hydrogen gas produced during charging.

9. When the thumb, forefinger (first finger) and a second finger of the right hand are held mutually at right angles with the forefinger points to the direction of the field, the thumb points to the direction of motion and the second finger points to the direction of induced current.

10. $V=f\lambda\sqrt{1}$
200,000x 1500 = 30,000,000 m/s
$= 3.0 \times l0^8 m/s/\sqrt{1}$

11.

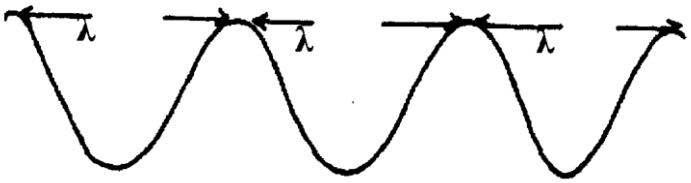


12. (a) Constant vo1tageJ'
(b) 3x20√1
=60V√1

13. (a) (i) T=36/20√=1.8 sec√

(ii) Frequency = $\frac{1}{T}$
=$\frac{1}{1.8}$ =0.5556HZ.√

(iii)



3 λ= 80cm
λ= 80/3=26.67cm√
But v =fλ
= 0.5556 x 26.67cm√
= 14.82m/s or 0.1482m/s
(d) (i) D =SX ½ t
= 1450 x ½ x 0.20 s√
=145m √
(ii) Depth from the water surface to the top of the reef
=1450x ½ x0.16
=1450 x 0.08
= 116m√
.. Height of sunken reef= 145 - 116
= 29m√

14. (a) (i) Unlike charges attract like charges repel.
(ii) - For a positively charged rod the leaf diverges.
- For a negatively charged rod the leaf divergence decreases.
(b) (i) Charge — Voltage x Capacitance√
Q=CV
= 12X50MF√1
= 600MC or 6 x 10^{-4}C√1
(ii) Total charge 6 x 10^{-4}C√1
$Q_T = C_1V+C_2V$√1
Where V is voltage across both capacitors in parallel.
6 x 10^{-4} = 5 x 10^{-5}V + 2 X 10^{-5}V
6x 10^{-4}7x 10^{-5}V
V =8.57V√1

15. (a) (i) Light must travel from denser medium to less dense medium.
Angle of incidence in the denser medium must be greater than critical angle in the less dense medium.
(b) (i) $\frac{\sin i}{\sin r}$ =n

$\frac{\sin 30°}{\sin 18°} = 1.618$

n = 1.618

(ii) $\sin C = \frac{1}{n}$

$\sin C = \frac{1}{1.6\ 18}$

$C = \sin^{-1}\ 0.61804$

C = 38.17°

16. (a) (i) Parallel $\frac{I}{R} = \frac{1}{6} + \frac{1}{4} + \frac{1}{8}$

$\frac{1}{R} = \frac{2+3+4}{12}$

$\frac{I}{R} = \frac{9}{12}$

$R = 4 = 1\ ^1/_3\Omega$

$R_1 = 4 + 1^1/_3$

$= 5^1/_3\Omega$

(ii) V=IR

I = V/R=4.5/5.33

= 0.844A

=3.377V

(b) E = 3.2r + 2.8(3.2)E 5r + 5(1.6)

E=3.2r+8.96 E=5r+8=…

Solve 1 & 2 simultaneously

r=0.533 Ω= 100.67V

17. (a) (i) - Where green / yellow should have been blue

-. Where Brown should have been Green / yellow.

- Where Blue should have been Brown.

- Earth should be connected Green yellow wire.

- Live wire / brown should be connected to the fuse.

- Neutral should have been connected with blue.

(ii) - The appliance connected to it will blow.

- To conduct the current to the earth in case of short circuit thus saving the appliance.

(b) (i) Power consumed by five 60W bulb =60 x 5 300W = 0.3Kw

- Power consumed per day = 0.3 x 3.5 = 1 .O5Kwh

(ii) - Power consumed in 7 days = 1.05 x 7 = 7.35Kwh

Cost per week = No. of Kwh x cost per Kwh

=Ksh.49.25

18. Lenz'slaw

(a) Induced current is such as to oppose the change causing it.

(b)When switch is closed, a magnetic field is developed in the coil J. On the left. The changing magnetic flux is linked on the coil on the right hence inducing an electromotive force in it q making current to flow in one direction when the switch B opened the magnetic field dies and in the process cuts the coil in the opposite direction √1

(c) $\frac{75}{100} = \frac{30}{\text{pin put}}$√

Pin put= $\frac{100 \times 30}{75}$

Pinput=40w

Pinput =V1
40= 12x1
1=40/12
I=3.333A
(d) (i) A - Slip rings√
B —Carbon brushes√
(c)As the cell rotates the magnetic flux through it changes √
The rate at which the flux changes greatest where the coil is horizontal, the flux through the coil increases until the coil is vertical where induced e.m.f is zero. As the coil passes vertical line, the flux through it decreases generating an e.m.f in opposite directions√
The e.m.f reaches maximum when the coil is horizontal and moving in a negative direction.

KAKAMEGA SUB – COUNTY JOINT EVALUATION EXAM – 2015.
232/3
PHYSICS PAPER 3
MARKING SCHEME.

QUESTION 1.

Time in Minutes	0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5
$T_1(^0C)$	94	78	71	67	61	58	52	49	47	46	44	43
$T_2(^0C)$	96	60	51	39	34	31	28	26	24	22	21	20

Time in Minutes	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0
$T_1(^0C)$	41	39	37	36	35	33.5	33	32	32

T_1 values
- T_1 values should lie between 97^0c - 30^0c.
- Should be decreasing
- ½ mk four each max (5mks)

T_2 values
- Values should lie between 97^0c - 18^0c.
- Should be decreasing
- First value of t_2 must be more than first value of t_1
- The other values of $t_2$must be lower than corresponding value of t_1.
- ½ mk for each max (5mks)

Plotting t_1
- Axes labelled (both) 1 mk
- Simple + uniform scale 1mk
- Plotting 4 points correctly - ½ mk each max 2mk
- Smooth curve passing through atleast 6 points 1mk *with negative slope.*

Plotting t2
- Plotting 4 points correctly – ½ mk each max 2mks
- Smooth curve passing through atleast 6 points 1mk *with negative slope*

K (i) – Time taken for t1 to fall from 60^0c to 40^0c from student's graph – ½ mk
- Time taken for t_2 to fall from 60^0c to 40^0cfom students graph n- ½ mk

(ii) Showing the substitution – ½ mk
correct evaluation - ½ mk

Question 2.

L (cm)	L (m)	V	I (a)	$\frac{v}{I}$
100	1.00	1.45	0.04	
90	0.90	1.40	0.05	
70	0.70	1.35	0.08	
50	0.50	1.30	0.09	
40	0.40	1.25	0.12	
20	0.20	1.15	0.02	

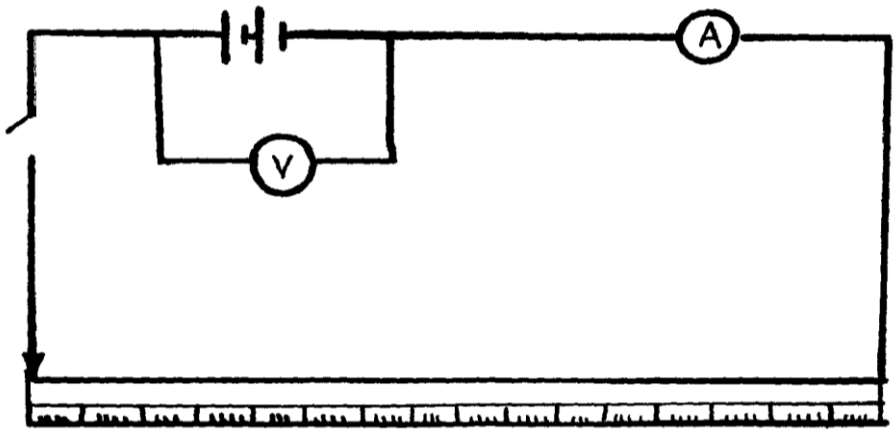
Atleast 5 correct values of L (m) 1dp a must – 1mk
Decreasing value of v between (1.5 – 0.9) v 1 dp a must – ½ mk each max (2½ mks)

Increasing values of i between (0.02 – 0.4) a – 1 dp a must. ½ mk each max 2½

Atleast 5 correct values of $\frac{v}{I}$ 2 dp a must – 1 mk

total 7mks

Iii) a)



arrangement of cells in series and voltage across with switch open. 1mk

B) e.m.f = (3.0 ± 0.2) 1 dp a must 1mk

Iv)

- Both axes correctly labelled 1mk
- Simple + uniform scale 1mk
- Plotting 4 points correctly - ½ mk each max 2mks
- A line with positive gradient passing through atleast 3 correctly plotted points. 1mk

v) NB No line slope

- correct intervals 1mk
- substitution 1mk
- evaluation (units a must) 2 dp – 1mk

vi)

- d .....mm 2dp a must ½ mk
- d..... 2dp in standard form ½ mk

vii)

- substitution of d and S – 1mk
- evaluation of h 3dp – 1mk