FORM FOUR EVALUATION TEST

END OF 2ND TERM – 2018

MARKING SCHEME

PHYSICS PRACTICALS F.4 232/2 PP_3 EXAM

July/August

1. $\frac{360^0}{\theta} - 1 = 5$

✓Either

$360^0 = 6\theta$

$= 60^0$ ✓

2. To absorb echo sound✓ .

3. a) To separate the magnets. ✓

   b) To complete the chain of dipoles.

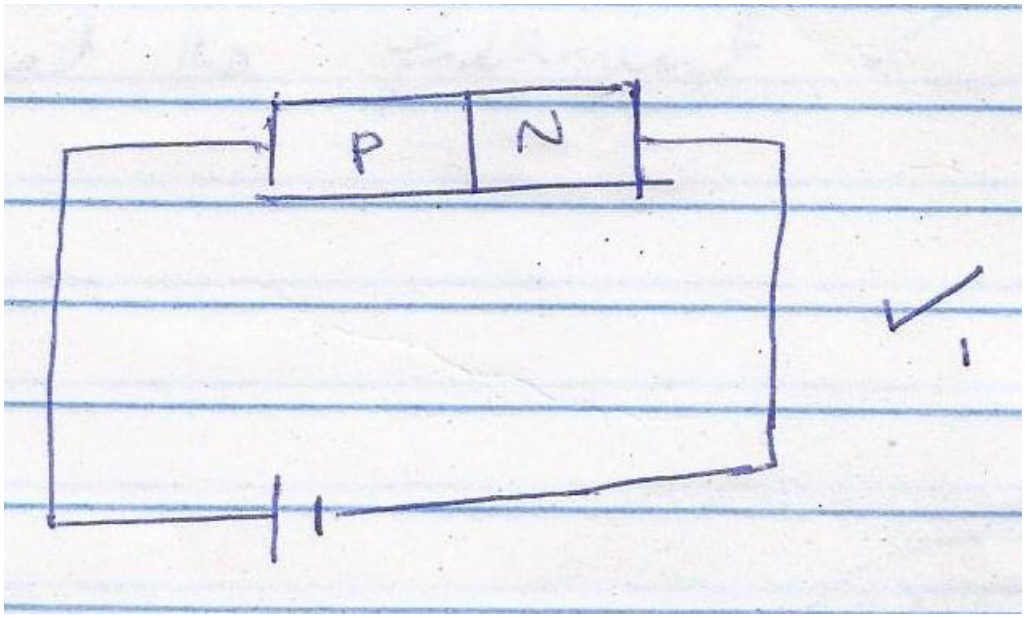
4. The electrolyte used cannot spill.

   The dry cell has a lower internal resistance.
   Dry cell is more portable as compared to accumulator.
   Dry cells and less expensive (only one ✓)
   Dry cell can be made in using small size to fit in small applications.

5. - Reducing the number of turns.
   - Reducing the amount of current flowing through the coil.

6. Image formed by apparent intersection of light rays/images that cannot be formed on the screen.

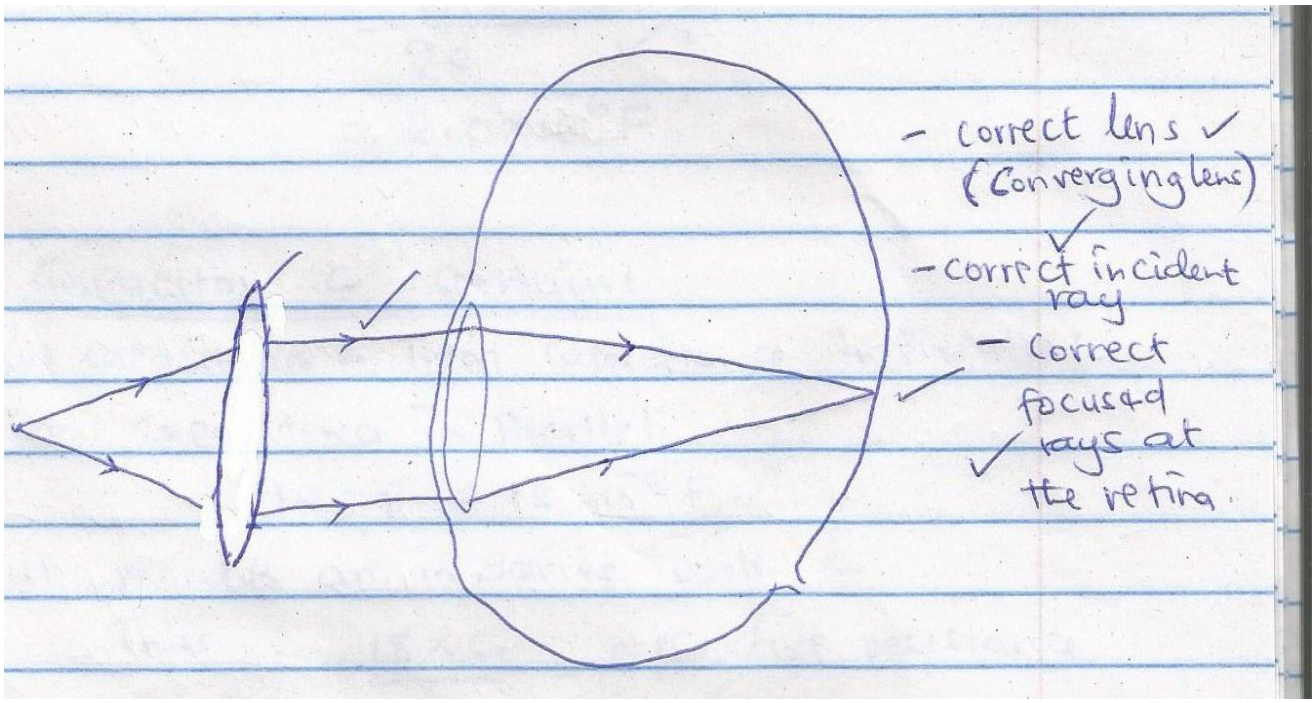
7.



8. Glass is a poor conductor; radiant heat from sun has higher frequency than heat from wood, hence able to penetrate. √ √

9. To heat the filament. ✓

10.



- Correct lens✓ (converging lens)
- Correct ✓incident ray
- Correct focused rays at the retina✓

11. Effective capacitance in the circuit.

Q = CV

C = Q/V

$= \frac{5.4 \times 10^{-4}}{90}$ ✓

$= 6.0 \times 10^{-6}$ F

Capacitor C contains

Effective capacitance – Total capacitance in parallel
Total capacitance in parallel
$10 + 8 = 18 \times 10^{-6}$F

But A and B are in series with C.

Thus $\frac{18 \times C}{18 + C}$ = Effective resistance

6 UF = $\frac{18C}{18 + C}$ ✓

$108 + 16C = 18C$

$109 = 12C$

$9 = c$ ✓

Capacitance for C = 9.0×10^{-6}F.

12. $F = \frac{1}{1}$

But T = 5cms = 5 x 10-=3S

$F = {}^{1}/_{5.0} \times 10\text{-}3 = \frac{1000}{5} = 200H_Z$

13. Gradient,

S = $\frac{21000 - 2000}{}$ ✓

25000 – 1300

= 1.667

$E = \frac{1}{S} = \frac{1}{1.667}$ ✓

= 0.6V ✓

14. as resistance increases heating increases. ✓ 1

15. a) Voltage across the

b) i) VR = 4 x 12 = 48v ✓ 1

$V_{3ohms} = \frac{6}{5}$ x 12 = 14.4 V ✓ 1

E.M.F = 48 + 36 + 14.4 = 98. 4V ✓ 1

ii) Total ratio = 3 + 2 = 5 ✓ 1

$A_1 = {}^{2}/_{5}$ x 12 = 4.8 A ✓ 1

A_2 = 3/5 x 12 = 7.2A ✓ 1

c) i) P = IV, $I = {}^{V}/_{R}$

$P = \frac{V^2}{R}$

$= \frac{240^2}{100}$ = 576 walts ✓

ii) V = IR ✓ 1

$I = \frac{240}{100}$ = 2.4 A

16. a) i) To prevent loss of energy of the electrons as a result of collision with air particles in the tube before reaching the target.
✓

ii) Copper being a good conductor of heat helps in conducting away the heat produced. ✓

Iii) The X – rays produced are hard/more penetrating/WTTE. ✓

b) i) Cooling fins are used to cool the hot anode.

ii) X – ray photographs can reveal injury or the infection of the tissue. ✓

- Diagnosis of cancer ✓ (Any two)
- Treatment of cancer

c) To accelerate the electrons sufficiently to produce X – rays when they strike the target. ✓

d) i) K.E = C

$= 1.6 \times 10^{-19} \times 250 \times 10^{3}$

$= 4.0 \times 10^{-17} J \times 10^{3}$

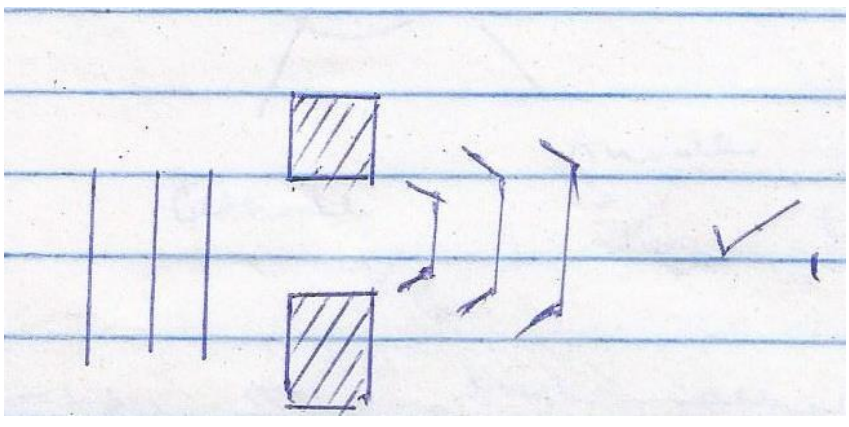
$= 4.0 \times 10^{-14} J$

ii) X – ray energy = K.E of electron x 0.5%

$\frac{4.0 \times 10^{-14} \times 0.5}{100} = 2.0 \times 10^{-16} J$ ✓

a) Spreading out of the waves after passing through an opening or e barrier. ✓1

b) I)



ii) I - Diffraction would be more pronounced ✓1

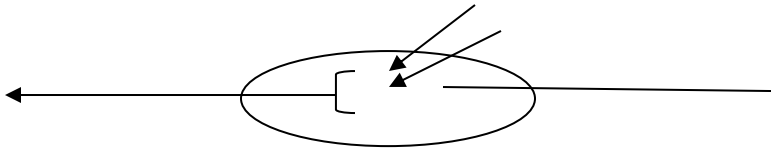
II – There would be very minimum diffraction ✓ 1

c) i) $d = \frac{30}{15} = 2cm$

ii) $T = {}^{1}/_{f} = \frac{1}{20}$ ✓ = 0.05 seconds

iii) $V = \lambda f$✓ = 20 x $\frac{2}{100}$ = $0.4ms^{-1}$✓

18.



Cathode ✓ ½ Anode ½ ✓ both correct

ii) When light strike cathode, surface electrons gain photons (energy). ✓ 1 Hence electrons escapes from the cathode ✓1

v) E = hf ✓

= $6.63 \times 10^{-34} \times 8.6 \times 10^{14}$ ✓

= 5.7×10^{-19}J✓

vi) (Beta particles)

- Negatively charged ✓
- Have mass of an electron ✓ only one
- Higher penetrative ability than alpha✓
- Higher ionizing power than gamma✓

19. a) i) Brown lead should be connected where the blue one is: Yellow to be connected where the brown is, and the blue lead to be connected where the green/yellow is connected. (Any two)

ii) No current will flow

iii) - The earth pin opens the holes/blinders for the live and neutral. ✓
- Ensures it reaches the metallic part of the appliance/earthling. ✓

b) i) $\frac{75 \times 5 \times 5}{1000}$ ✓ = 1.875kwh ✓

ii) 1.8875 x 7 x 6.7 = ksh 87.9375

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