**FORM FOUR END OF TERM 2 EXAMINATION 2022**

**Kenya Certificate of Secondary Education (K.C.S.E)**

**232/ 2**

**PHYSICS**

**PAPER 2**

**MARKING SCHEME**

|  |  |
| --- | --- |
| 1. *Angle of incidence = angle of reflection =00* | *√ 1mark* |
| 1. *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 If the rod now touches the cap, it neutralizes the negatives charges ,*  *If it is withdrawn, the positive charge will be more in the electroscope hence charged positively* | *√ 1mark*  *√ 1mark* |
| 1. *E=V +Ir* | *√ 1mark* |
| 1. *When the bulb is at the Centre of curvature, it produces a stronger parallel beam that travels longer distance.* | *√ 1mark* |
| 1. *Q=It, Q= 2A x 2.5 x 60=300 C*   *Number of electrons=300C/1.6 x10 -19C*  *=1.875 x 1025electrons* | *√ 1mark*  *√ 1mark*  *√ 1mark* |
| 1. *It penetrates deepest*   *It is easily reflected even by tiny grains* | *√ 1mark* |
| 1. *Angle 420(must be measured directly from the diagram)*   *n=1/𝑆𝑖𝑛 𝜃*  *n=1/𝑆𝑖𝑛 42=1.4945* | *√ 1mark Correct angle measured*  *√ 1mark Subst.*  *√ 1mark Correct answer* |
| 1. *i) Image that cannot be focused on the screen*   *(ii)* | *√ 1mark*  *correct definition*  *√ 2mark correct rays @ √ 1mark*  *√ 1mark- Inverted image with respect to the object(Image is Upright)* |
| 1. *.* | *√ 1mark*  *√ 1mark*  *√ 1mark* |
| 1. *P*   *It takes a smaller current to achieve magnetic saturation as compared to Q OR P is easily magnetized than Q* | *√ 1mark*  *√ 1mark* |
| 1. *Provide an inert atmosphere to prevent the oxidation of the filament* | *√ 1mark* |
| 1. *.Thermionic emission is the process of emission of electrons through heat energy while photoelectric effect is the process of emission of electrons when radiation of sufficient energy/frequency is irradiated on a metal surface* | *√ 1mark* |
| 1. *a=234, b=82* | *√ 1mark √ 1mark* |
| 1. *a). a thin wire has got more resistance to the flow of current as compared to the copper leads hence produces a higher heating effect than copper leads*   *b) (i) Electrical energy to heat energy and Light Energy*  *(ii) –Resistance of the conductor*  *- Quantity of current flowing*  *- Time of heating*  *(iii) being made of material of high melting point, it withstand the high temperature inside the filament bulb*  *c) (i)*  *or use =60.63W*  *(iii)* | *√ 1mark*  *√ 1mark*  *√2marks (Any two)*    *√ 1mark*  *√2marks*  *√2marks* |
| 1. *.a)*     500  *(b)*    *c) I The image will appear smaller*  *ii The image will appear larger*  *iii Each pinhole will form its image resulting into brighter but blurred image*    **λ**  **λ**  **λ**  **C**  **C**  **C**  **C**  **R**  **R**  **R**  **R**   1. *.* 2. *Presses lightly against the commutators so that the coil rotates freely and easily.* 3. *Graphite is a good conductor of electricity*   *It serves as a lubricant since it is slippery*   1. *X - North Pole*   *Y - South pole*   1. *I) Soft iron since it and easily magnetized and demagnetized*   *ii) South pole*  *iii)* *- by increasing the strength of current*  *- By increasing the number of turns per unit length*  *- By replacing the core with a U shaped one*   1. *X is connected to a forward biased diode which makes the junction to become smaller while Y is connected to a Reverse biased diode. Diodes conduct only in forward bias.* 2. *a) X-rays have high penetrating power.*   *b) i A. Cooling fins*  *B. Copper anode.*  *ii) Tungsten or molybdenum. It is made of high melting point to withstand*  *high temperatures.*  *iii) To absorb the stray x-ray radiations which would otherwise affect the x-ray tube operators.*  *iv) -By efficient cooling fins on the outside of the tube.*  *-By circulating oil through the channels in the copper anode.*  *c) (i)*    *ii)* | *√ 1mark (Reflection)*  *√ 1mark (Angles)*  *√ 1mark*  *√ 1mark*  *√ 1mark*  *√ 1mark*  *√ 1mark*  *√ 1mark*  *√ 1mark*  *√ 1mark*  *√ 1mark*  *√ 1mark*  *√ 1mark*  *√ 1mark*  *√ 1mark*  *√ 1mark*  *√ 1mark*  *√ 1mark*  *√ 1mark*  *√ 1mark*  *√ 1mark*  *√ 1mark*  *√ 1mark*  *√ 1mark*  *√ 1mark*  *√ 1mark* |
| 1. *a) (i) Ultra violet, X-rays*   *(ii) Red, Yellow, Green, Blue*  *b) Indicated on the diagram*      *(ii) When V=U=4cm,then,Radius of curvature ,r , =4cm(object and Image is also at C*  *(iii) Since f=𝑟/2 =4𝑐𝑚/2 =2𝑐𝑚*  *(iv) M=𝑉/𝑓 −1, 𝑚=4/2 −1=1 OR m=v/u=4/4=1*    *c (i) A bright fringe/band formed –at constructive interference*  *(ii) loud sound* | *√ 1mark .*  *√ 1mark*    *√ 1mark*  *√ 1mark*  *√ 1mark*  *√ 1mark*  *√ 1mark*  *√ 1mark*  *√ 1mark* |
| 1. *.(a) i) Anode*   *(ii) When UV is illuminated on photocell, photoelectrons are emitted. Emitted photoelectrons are attracted toward plate A, completing the circuit, photocurrent flows hence deflection on the milliammeter.*  *iii) Milliammeter reading increases/Deflection on milliammeter increases*  *b) (i) Emf is the voltage intercept=1.50V*  *(ii) slope =-r*  *Points,(0,1.5), (4.5,0.5), slope =1/-4.5 r=0.22Ω* | *√ 1mark*  *√ 1mark*  *√ 1mark*  *√ 1mark*  *√ 1mark*  *√ 1mark*  *√ 1mark-Correct subst.*  *√ 1mark- Correct ans. with unit* |