

KISII SCHOOL
FORM 4G PHYSICS RAT 8
TERM ONE 2020
Time: 30 minutes

X-RAYS

1. (a) State any **four** properties of X-rays. (4 marks)

.....

.....

.....

.....

- (b) State **two** properties of X-ray which makes it suitable for use in taking X-ray photography. (2 marks)

.....

.....

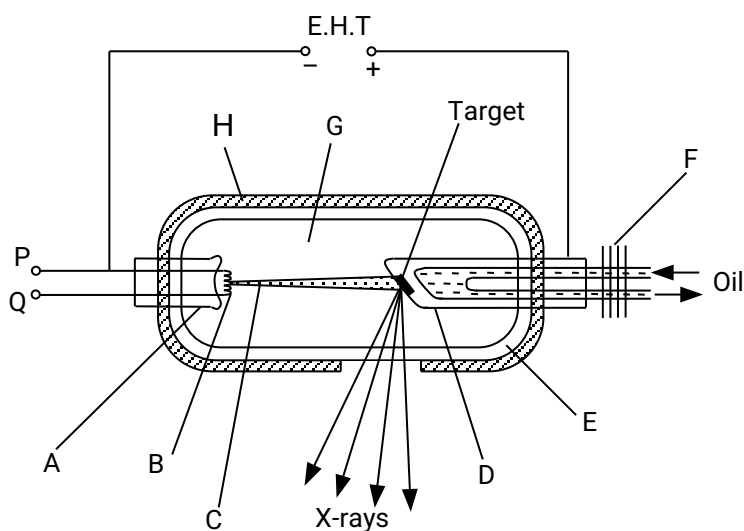
- (c) Explain briefly the use of X-rays in the textile industries. (2 marks)

.....

.....

.....

2. The diagram below shows the main features of an X-ray tube which is producing soft X-rays.



- (a) Name the parts labelled **A, B, C, D, E, F, G** and **H**. (4 marks)

.....

.....

.....

.....

- (b) Give **two** types of materials which can be used as the target and explain why they are suitable for use as the target. (3 marks)

.....

.....

- (c) Describe how X-rays are produced in the tube. (2 marks)

.....

.....

- (d)) State and explain the adjustment which should be made in the above X-ray tube so as to make it produce hard X-rays. (2 marks)

.....

.....

.....

- (e) State and explain the effect of increasing the p.d. across terminals PQ. (2 marks)

.....

.....

.....

- (f) State **three** ways in which heat is removed from the above X-ray tube. (3 marks)

.....

.....

.....

3. In a certain X-ray tube, the electrons are accelerated by a P.d. of 12 kV. Assuming all the energy goes to produce X-rays, determine the:

- (i) the frequency of the X-rays produced. (3 marks)
(Charge of an electron, $e = 1.6 \times 10^{-19}$ C and Planck's constant $h = 6.62 \times 10^{-34}$ Js).

.....

.....

.....

.....

.....

- (ii) wavelength of the X-rays produced. (Velocity of light, $c = 3.0 \times 10^8$ m/s) (3 marks)

.....

.....

.....

.....