

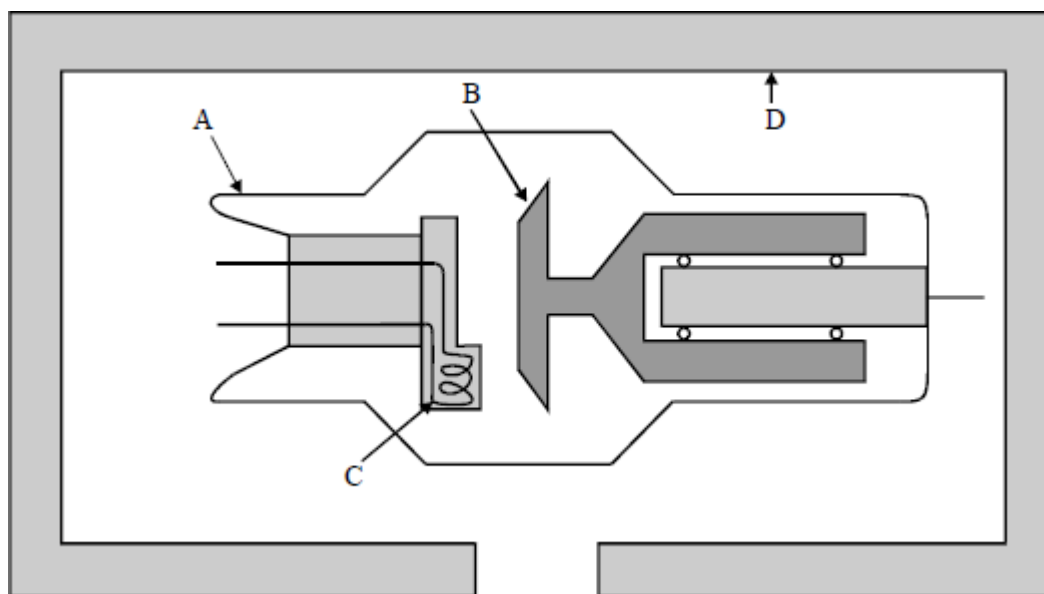
Name of the Student: _____

Max. Marks : 23 Marks

Time : 23 Minutes

Q1.

The simplified diagram shows a modern X-ray tube.



(a) For each of the labelled parts, state what it is and explain its purpose.

A name _____

purpose _____

B name _____

purpose _____

C name _____

purpose _____

D name _____

purpose _____

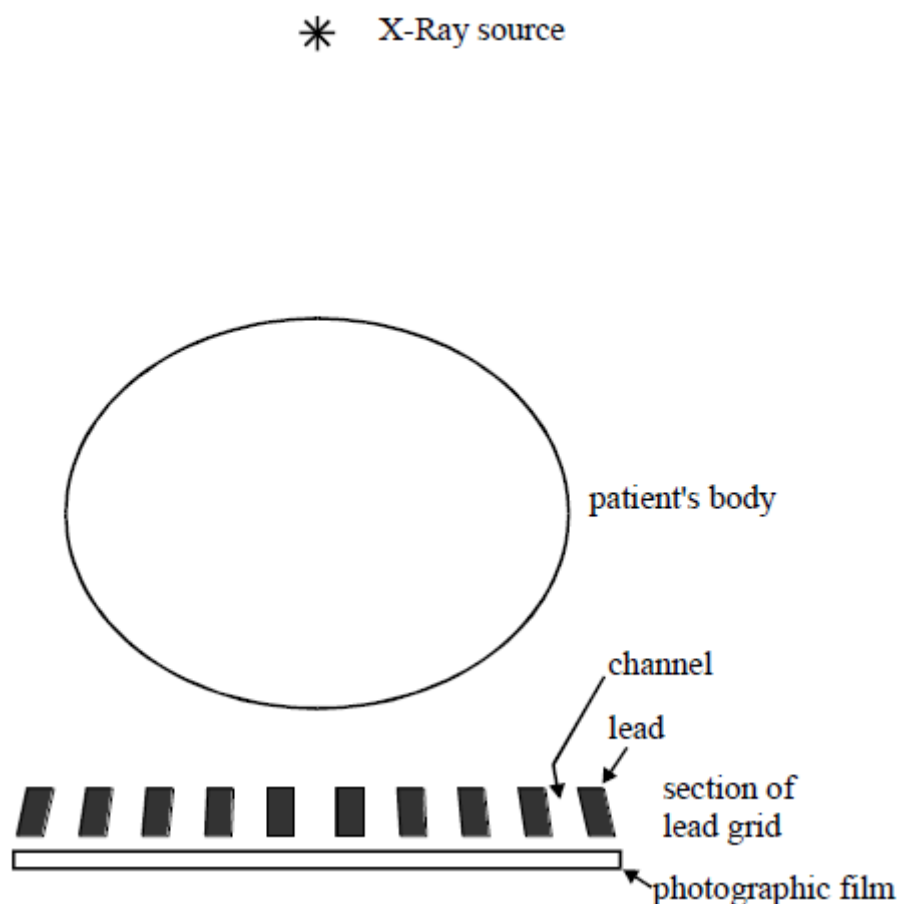
(8)

- (b) On the diagram draw and label
- the direction of the electron beam,
 - the direction of the useful X-ray beam.

(2)
(Total 10 marks)

Q2.

When using an X-ray source to produce an image of part of a patient a lead grid is sometimes placed between the patient and the photographic film, as shown in the diagram. The channels in the grid diverge from the X-ray source.



- (a) (i) Why is the grid made of lead? _____

- (ii) By drawing the paths of about 10 rays from the X-ray source to illustrate your answer, explain how the use of the grid improves the clarity of the X-ray image.

(5)

- (b) Explain why it is important to use a *point source* of X-rays for imaging purposes.

(1)
(Total 6 marks)

Q3.

(a) For the eye defect astigmatism, complete each of the following.

(i) Astigmatism is caused by _____

(ii) The image seen by a person with astigmatism is _____

(iii) Astigmatism is corrected using _____

(3)

(b) A person has a myopic eye with a range of clear vision at distances from his eye of 0.15 m to 0.80 m.

(i) Calculate the power of the correcting lens which would allow this eye to produce focused images of distant objects.

(ii) Calculate the new near point position for the eye when using the correcting lens.

(4)
(Total 7 marks)