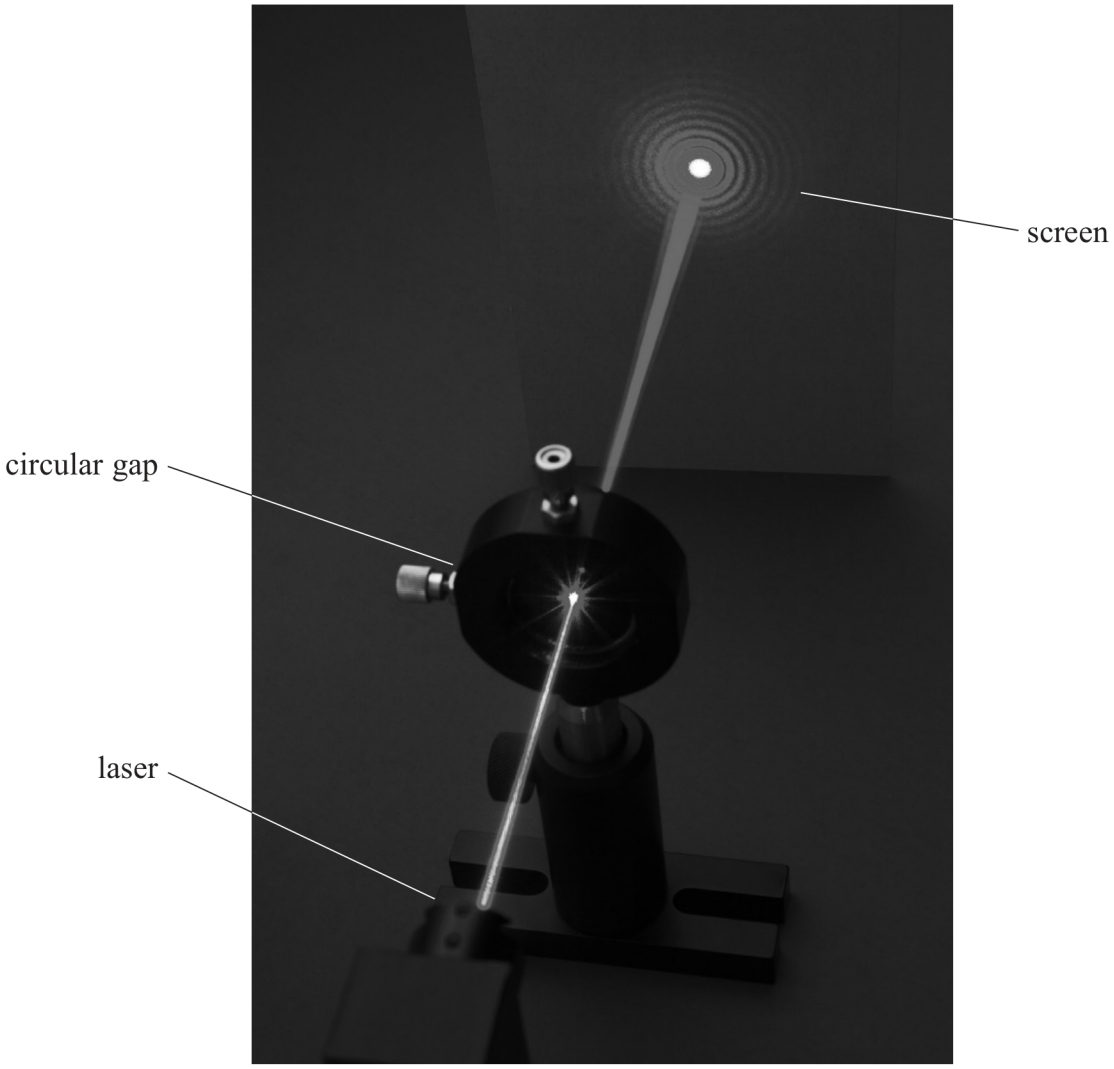
16 When laser light is directed through a small circular gap, a diffraction pattern can be observed on a screen as shown.



(Source: © GIPHOTOSTOCK / SCIENCE PHOTO LIBRARY)

(a) Explain, using Huygens' construction, how diffraction occurs as waves pass through a gap.

(2)

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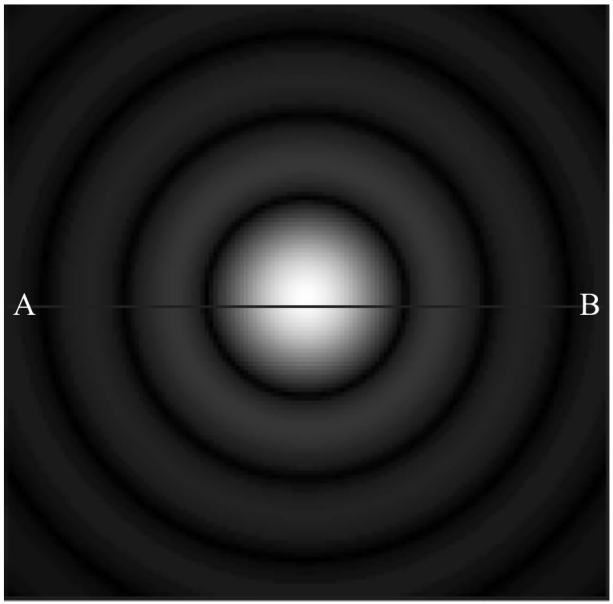
(b) The diffraction pattern consists of a central bright spot surrounded by concentric circles of light of decreasing intensity. A close-up of the pattern is shown below.



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Sketch a graph showing how the intensity of the light in the diffraction pattern on the screen varies along the line AB.

(3)

(Total for Question 16 = 5 marks)