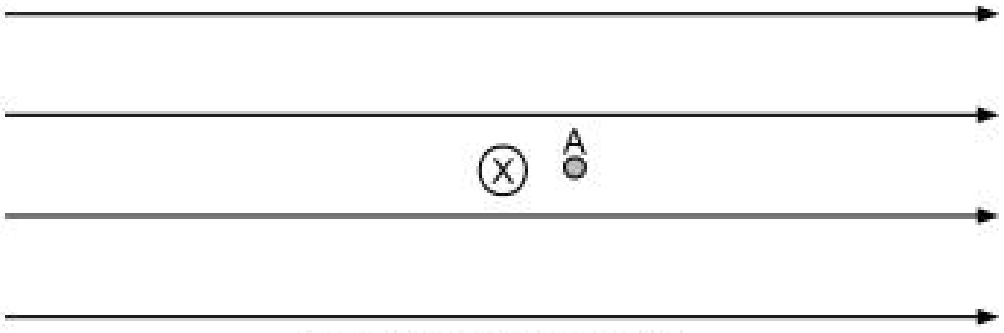
Question 10 **(7 marks)**

An experiment was conducted to determine the effect of an external magnetic field on a current carrying conductor. A DC solenoid was used to produce a constant magnetic field of 32.0 μT. A conductor carrying a direct current of 285 mA was introduced to the magnetic field. The conductor was fixed in place and carries the current directly into the page. Point A is 8.00 mm from the centre of the conductor, along a line parallel to the constant magnetic field as shown below.



(a) Use the information above to calculate:

(i) the magnitude of the magnetic field at point A due to the current in the conductor. (2 marks)

Answer magnitude _____ T

(ii) the magnitude and direction of the resultant magnetic field at point A. If you were unable to obtain an answer to part (a)(i), use 6.00×10^{-6} T. Include a diagram in your answer. (3 marks)

Answer magnitude _____ T

Direction _____

(b) Sketch the resultant magnetic field around the conductor. (2 marks)