Question 7 **(5 marks)**

A rectangular coil of a car alternator (AC generator) has 3.20×10^2 turns, a radius of 7.00 cm and a length of 6.00 cm. The coil rotates in a uniform magnetic field supplied by electromagnets. The alternator is designed to produce sufficient output voltage to recharge the car battery even when the alternator rotates at 6.00×10^2 rpm. The output voltage is steady at 14.5 V rms.

(a) Determine the peak voltage output of this alternator. (1 mark)

Answer _____ V

(b) Calculate the magnetic field strength needed to produce this peak output voltage. If you were unable to obtain an answer for part (a), use 25.0 V. (4 marks)