1998 Paper 2 Question 4

Probability

A practical class which is conducted in Cockcroft 4 makes use of 10 DECstations and 5 PWFs. It is known that the probability of any particular DECstation failing during the class is a and the probability of any particular PWF failing during the class is b. All failures may be assumed to be independent.

After the most recent class the demonstrator reported that *two* workstations had failed. Write expressions for:

(a) the probability that both failures were of DECstations   [5 marks]

(b) the probability that one DECstation failed and one PWF failed   [5 marks]

(c) the probability that both failures were of PWFs   [5 marks]

Hence or otherwise show that if $a = b$ the probabilities in the three cases are respectively 9/21, 10/21 and 2/21.   [5 marks]