

Name:..... Student Number:.....

Q1: Let E be the relation on $A = \{1, 2, 3, 4, 5\}$ represented by the following matrix

$$M_E = \begin{pmatrix} 1 & 0 & 1 & 0 & 1 \\ 0 & 1 & 0 & 1 & 0 \\ 1 & 0 & 1 & 0 & 1 \\ 0 & 1 & 0 & 1 & 0 \\ 1 & 0 & 1 & 0 & 1 \end{pmatrix}$$

1. List all ordered pairs of E . (1 marks)

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2. Show that E is an equivalence relation on A . (3 marks)

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Q2: Let P be the partial ordering relation defined on $B = \{a, b, c, d, e, f\}$ by
 $P = \{(a, a), (a, c), (a, f), (b, b), (c, c), (c, f), (d, d), (d, e), (e, e), (f, f)\}$.

1. Represent P by a hasse diagram. (2 marks)

2. Is P a total order? (1 mark)

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Q3: Let G be a graph with degree-sequence: $y, y - 1, y - 2, y - 3, y - 4$. Find the value of y if G has 5 edges. (2 marks)

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