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Family name Given name Student number

**ENS1161 Computer Fundamentals**

**Test 6**

(a) Each of the diagrams below shows a relation between sets P and Q. Your task is to determine whether the relation P → Q is a function, and if so, what type of function. For each diagram, use labels A, B, C, D or E to indicate whether the relation is:

A: not a function;

B: a function that is one-to-one but not onto;

C: a function that is onto but not one-to-one;

D: a function that is neither one-to-one nor onto;

E: a function that is both one-to-one and onto.

P Q

P Q

P Q

P Q

P Q

P Q

C A C A A E

(b) If  and , find the value of g(f(1))

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(c) Let w be a function from set S = {a, b, c, d, e, f, g} to itself defined by:

w = {(a, d), (b, b), (c, g), (d, a), (e, e), (f, c), (g, f)}

(i) Is w one-to-one? (Answer Y or N) Y

(ii) Is w onto? (Answer Y or N) Y

(iii) Does w have an inverse? (Answer Y or N) Y

(d) State the rule for the inverse of 

h–1(x) =

(e) Let p be a function from A = {a, b, c, d} to B = {e, f, g, h} defined by:

p = {(a, e), (b, g), (c, f), (d, h)}

State the value of: (i) p(b) g

(ii) p−1(e) a

[ 3 + 1 + 3 + 1 + 2 = 10 marks ]