Quiz 5

Deadline	Wednesday, 09 October 2019 at 4:00PM
Latest Submission	Wednesday, 09 October 2019 at 12:49AM
Raw Mark	5.00/5.00 (100.00%)
Late Penalty	N/A
Final Mark	5.00/5.00 (100.00%)

Question 1 (1 mark)

Consider $f,g:\mathbb{Z}\to\mathbb{Z}$ given by:

- $f(n) = 2n$
- $g(n) = n \text{ div } 2$

Which of the following statements are true? Select all that apply

(a) ☑	f is an injection
(b) ☐	g is an injection
(c) ☐	$f \circ g$ is an injection
(d) ☑	$g \circ f$ is an injection
(e) ☐	f is a surjection
(f) ☑	g is a surjection
(g) ☐	$f \circ g$ is a surjection
(h) ☑	$g \circ f$ is a surjection

✔ Your response was correct.
Mark: max(0.25 + 0.25 + 0.25 + 0.25, 0) = 1.00

Question 2 (1 mark)

Let F denote the set of functions from $\mathbb{N}$ to $\mathbb{N}$. Define the relation R on F×F as follows:

$(f,g) \in R$ if $f(n) \leq g(n)$ for infinitely many $n \in \mathbb{N}$

Which of the following properties does R have? Select all that apply

(a) ☑	Reflexivity (R)
(b) ☐	Antireflexivity (AR)
(c) ☐	Symmetry (S)
(d) ☐	Antisymmetry (AS)
(e) ☐	Transitivity (T)

✔ Your response was correct.
Mark: 1.00

Question 3 (1 mark)

Let F denote the set of functions from $\mathbb{N}$ to $\mathbb{N}$. Define the relation R on F×F as follows:

$(f,g) \in R$ if $f(n) \neq g(n)$ for only finitely many $n \in \mathbb{N}$

Which of the following properties does R have? Select all that apply

(a) ☑	Reflexivity (R)
(b) ☐	Antireflexivity (AR)
(c) ☑	Symmetry (S)
(d) ☐	Antisymmetry (AS)
(e) ☑	Transitivity (T)

✔ Your response was correct.
Mark: max(0.33 + 0.33 + 0.33, 0) = 1.00

Question 4 (1 mark)

Sort the following words over $\Sigma=\{0,1\}$ in **lexicographic** ordering

- 000
- 0001
- 010
- 0111
- 100
- 101

✔ Your response was correct.
Mark: 1.00

Question 5 (1 mark)

Sort the following words over Σ={0,1} in **lenlex** ordering

- 000
- 010
- 100
- 101
- 0001
- 0111

✔ Your response was correct.
Mark: 1.00