

CANDIDATE

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TEST

Quiz 4

| Subject code | |
|-------------------|------------------|
| Evaluation type | |
| Test opening time | 06.03.2024 07:00 |
| End time | 13.03.2024 07:00 |
| Grade deadline | |
| PDF created | 13.08.2024 06:34 |

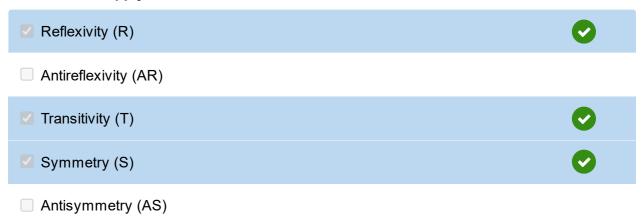
| Question | Status | Marks | Question type |
|----------|---------|-----------------------|-------------------|
| 1.1 | Correct | 1/1 | Multiple Response |
| 1.2 | Correct | 1/1 | Multiple Choice |
| 1.3 | Correct | 1/1 | Multiple Choice |
| 1.4 | Correct | 1/1 | True / False |
| 1.5 | Correct | 1/1 | True / False |
| 2.1 | Correct | 1/1 | Multiple Response |
| 2.2 | Correct | 1/1 | Multiple Response |
| 2.3 | Correct | 1/1 | Multiple Response |
| 2.4 | Correct | 1/1 | Multiple Response |
| 2.5 | Wrong | 0.02999999329447746/1 | Text Entry |

1.1 Consider the relation

 $R = \{(m,n) \in \mathbb{Z} imes \mathbb{Z} \ : \ m^2 =_{(5)} n^2 \}$

Which of the following properties does R satisfy?

Select all that apply



1.2 Let $\Sigma = \{a,b,c\}$ and define a binary relation R on Σ^* as follows:

 $(w,v) \in R$ if and only if length(w) = length(v).

Which of the following is true?

- R is neither an equivalence relation nor a partial order
- R is both an equivalence relation and a partial order
- R is a partial order and not an equivalence relation
- R is an equivalence relation and not a partial order



1.3 Consider the poset $(\{1, 3, 5, 9, 15, 45\}, |)$. What is glb(15,9)?

- 0 1
- 3



- **5**
- 9
- 0 15
- 45
- Doesn't exist

1.4 True or false:

For all relations R, if R is symmetric, then R = R[←]

False



1.5 True or false:

For all relations R, if R is transitive and antisymmetric, then R is reflexive



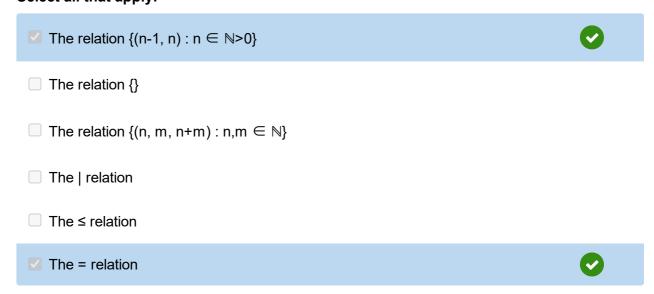
2.1 Let $\Sigma = \{0,1\}$ and consider the relation on Σ^* given by $R = \{(w,v) : length(w) \ge 2 \cdot length(v)\}$ Which of the following properties does R satisfy?

Select all that apply:

Reflexivity (R)



2.2 Which of the following relations (over ℕ) are also functions? Select all that apply:



2.3 Let $F = \mathbb{N}^{\mathbb{N}}$ 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 satisfy?

Select all that apply:

□ Antisymmetry (AS)☑ Transitivity (T)







Antireflexivity (AR)





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

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

Which of the following properties does R satisfy?

Select all that apply:

■ Transitivity (T)



- **2.5** Let $\Sigma = \{0,1\}$ and define $f: \Sigma^* \times \Sigma^* \to \Sigma^*$ and $g,h,k: \Sigma^* \to \Sigma^*$ as follows:
 - f(v,u) = uv for all $v,u \in \Sigma^*$
 - g(w) = f(01,w)
 - h(w) = f(10,w)
 - k = g∘h

