***LOGICA 2018/19 - Test n. 3***

***( Completamento di deduzioni naturali)***

Cognome e Nome \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Matricola \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Corso di Studi \_\_\_\_\_\_\_\_\_\_\_\_\_ indirizzo)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 1. ─p → q  **Ⱶ** ─ q → p | | | | | | |
|  |  |  |  |  |  |  |
| 1 |  | (1) | ─ *p* → *q* |  | **A** |  |
| 2 |  | (2) | *- q* |  | **A** |  |
| 1, 2 |  | (3) | ── *p* |  | **MTT** | 1,2 |
| 1, 2 |  | (4) | *p* |  | **DN** | 3 |
| 1 |  | (5) | ─ *q* → p |  | **PC** | 2,4 |
|  |  |  |  |  |  |  |

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| 1. q → r **Ⱶ** ( p ꓥ q ) → ( p ꓥ r ) | | | | | | | | | | | | | |
|  |  |  | | |  | | | |  |  | |  | |
| 1 |  | (1) | | | *q → r* | | | |  | **A** | |  | |
| 2 |  | (2) | | | *p ꓥ q* | | | |  | **A** | |  | |
| 2 |  | (3) | | | *p* | | | |  | **Eꓥ** | | 2 | |
| 2 |  | (4) | | | *q* | | | |  | **Eꓥ** | | 2 | |
| 1, 2 |  | (5) | | | *r* | | | |  | **MPP** | | 1, 4 | |
| 1, 2 |  | (6) | | | *p ꓥ r* | | | |  | **Iꓥ** | | 3, 5 | |
| 1 |  | (7) | | | *( p ꓥ q ) → (p ꓥ r)* | | | |  | **PC** | | 2, 6 | |
|  |  |  | | |  | | | |  |  | |  | |
| 1. ─ q → ( p → q ), ─q, p  **Ⱶ** q | | | | | | | | | | | | |
|  | | |  |  | |  |  |  | | |  | |
| 1 | | |  | (1) | | *─ q* → *( p* → *q )* |  | **A** | | |  | |
| 2 | | |  | (2) | | ─ *q* |  | **A** | | |  | |
| 1, 2 | | |  | (3) | | *p* → *q* |  | **MPP** | | | 1,2 | |
| 4 | | |  | (4) | | *p* |  | **A** | | |  | |
| 1, 2, 4 | | |  | (5) | | *q* |  | **MPP** | | | 3,4 | |

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| 1. ( p ꓥ q) ꓦ ( p ꓥ s)  **Ⱶ** p ꓥ ( q ꓦ s ) | | | | | | |
|  |  |  |  |  |  |  |
| 1 |  | (1) | *( p ꓥ q) ꓦ ( p ꓥ s)* |  | **A** |  |
| 2 |  | (2) | *p ꓥ q* |  | **A\*** |  |
| 2 |  | (3) | *p* |  | **Eꓥ** | 2 |
| 2 |  | (4) | *q* |  | **Eꓥ** | 2 |
| 2 |  | (5) | *q* ꓦ *s* |  | **Iꓦ** | 4 |
| 2 |  | (6) | *p ꓥ ( q ꓦ s )* |  | **Iꓥ** | 3, 5 |
| 7 |  | (7) | *p ꓥ s* |  | **A\*** |  |
| 7 |  | (8) | *p* |  | **Eꓥ** | 7 |
| 7 |  | (9) | *s* |  | **Eꓥ** | 7 |
| 7 |  | (10) | *q ꓦ s* |  | **Iꓦ** | 9 |
| 7 |  | (11) | *p ꓥ ( q ꓦ s )* |  | **Iꓥ** | 8, 10 |
| 1 |  | (12) | *p ꓥ ( q ꓦ s )* |  | **Eꓦ** | 1,2,7,6,11 |
|  |  |  |  |  |  |  |