Graph-Theoretic Property: atis Graph Theoretic Properties

(Graph-theoretic properties are those properties that are part of the meta-theory and have been abducted from graph theory to be used as a tool to provide solutions concerning the theory. Those solutions may be assigned as values to components or relations of the theory and thereby become part of the theory.)

Graph Theoretic Connected Properties:

Completely connected elements, $_{cc}E$, $=_{df} \{(\mathbf{x},\mathbf{y}) | \forall (\mathbf{x},\mathbf{y})[(\mathbf{x},\mathbf{y}), (\mathbf{y},\mathbf{x}) \in_{pc}E]\}$

Connected elements, $_{c}E$, $=_{df} \{(\mathbf{x},\mathbf{y}) | \exists \mathbf{y}((\mathbf{x},\mathbf{y}) \in_{pc}E \lor (\mathbf{y},\mathbf{x}) \in_{pc}E \}$

Disconnected elements, $_{d}E$, $=_{df} \{\mathbf{x} | \forall (\mathbf{x}, \mathbf{y}) [(\mathbf{x}, \mathbf{y}), (\mathbf{y}, \mathbf{x}) \notin_{pc}E] \}$

Initiating elements, $_{i}E$, $=_{df} \{ \mathbf{x} | \forall \mathbf{x}[(\mathbf{x}, \mathbf{y}) \in_{pc}E] \}$

Path-connected elements,

$${}_{pc}E, =_{\mathrm{df}} \{(\mathbf{x},\mathbf{y}) | (\mathbf{x} = \mathbf{x}_{o}, \mathbf{x}_{i}, \mathbf{x}_{2}, \dots, \mathbf{x}_{n-1}, \mathbf{x}_{n} = \mathbf{y}) \land \forall (\mathbf{x}_{i},\mathbf{y}_{i})_{i \leq n} [\mathbf{y}_{i} = \mathbf{x}_{i+1}] \}$$

Primary initiating elements, $_{ni}E$, $=_{df} \{ \mathbf{x} \mid \exists \mathbf{y}[(\mathbf{x},\mathbf{y}) \in_{nc}E \land \forall \mathbf{u}(\mathbf{u},\mathbf{x}) \notin_{nc}E] \}$

Receiving elements, $_{r}E$, $=_{df} \{ \forall \forall \forall [(\aleph, \forall) \in _{pc}E] \}$

Terminating elements, $_{t}E$, =_{df} { γ | $\forall \gamma$ [(x, γ) $\in_{pc}E \land \forall u(\gamma, u) \notin_{pc}E$ }

Unilaterally connected elements, $_{uc}E$, $=_{df} \{(\mathbf{x},\mathbf{y}) | \forall (\mathbf{x},\mathbf{y}) \in_{pc}E.\land. (\mathbf{y},\mathbf{x}) \notin_{pc}E]\}$

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