II BE Computer Engineering
Class Test-III June 2021
CER4C1 Discrete Structures

Time-70 Mins. **Maximum Marks** **[20]**

Note-Attempt all the questions.

Q.1 Use rules of inference to find the place where the treasure is hidden from the following statements- **[5]**

"If this house is next to a lake, then the treasure is not in the kitchen.", "If the tree in the front yard is an elm, then the treasure is in the kitchen.", "This house is next to a lake.","The tree in the front yard is an elm or the treasure is buried under the flagpole.", "If the tree in the back yard is an oak, then the treasure is in the garage."

Q.2 Let $\boldsymbol{T(x,y)}$ mean that student $\boldsymbol{x}$ likes cuisine $\boldsymbol{y}$, where the domain for $\boldsymbol{x}$ consists of all students at your college and the domain for $\boldsymbol{y}$ consists of all cuisines. Express each of these statements by a simple English sentence. **[5]**

$(\boldsymbol{a}) \sim \boldsymbol{T(Hussein, Japanese)}$

$(\boldsymbol{b}) \exists \boldsymbol{x T(x, Korean)} \wedge \forall \boldsymbol{x T(x, Mexican)}.$

$(\boldsymbol{c}) \exists \boldsymbol{y(T(Monica, y)} \vee \boldsymbol{T(Jay, y))}$

$(\boldsymbol{d}) \forall \boldsymbol{x} \forall \boldsymbol{z} \exists \boldsymbol{y((x = z)} \Rightarrow \sim \boldsymbol{(T(x, y)} \wedge \boldsymbol{T(z, y)))}$

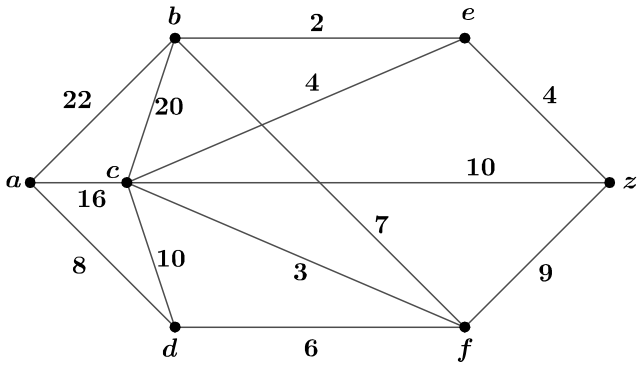
$(\boldsymbol{e}) \exists \boldsymbol{x} \exists \boldsymbol{z} \forall \boldsymbol{y(T(x, y)} \Longleftrightarrow \boldsymbol{T(z, y))}$

Q.3 Explain briefly- **[5]**

$(\boldsymbol{i})$ Adjacency matrix and Incidence matrix.

$(\boldsymbol{ii})$ Euler graph and Hamiltonian graph.

Q.4 Find the minimum distance between two vertices $\boldsymbol{a}$ to $\boldsymbol{z}$ of given graph, using Dijkstra's algorithm- **[5]**



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