Class Test 2

(Oct. 2021)

MC 405

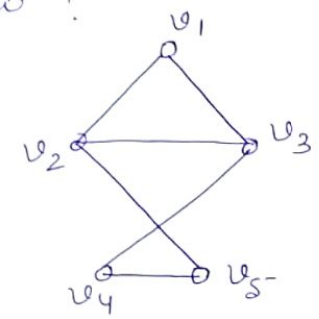
(Graph Theory)

Max. Marks : 15

Q1. Does there exist a tree having 1 vertex of degree 1, 2 vertices of deg. 2, 3 vertices of deg. 3, ..., n vertices of deg. n. Justify your answer. If yes, then draw such tree.

Q2. Show that the minimum height of a binary tree on n vertices is $\lceil \log_2(n+1) - 1 \rceil$ (where $\lceil m \rceil$ is the smallest integer $> m$) and maximum possible height is $\frac{n-1}{2}$.

Q3. By using Kirchhoff's matrix find the total number of spanning trees of the graph below :



Q4. Suppose some edge of a connected graph G belongs to every spanning tree of G. What can you conclude and why?