SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN
(AUTONOMOUS)
(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)
Chromepet, Chennai - 600 044.
B.Sc.Mathematics - END SEMESTER EXAMINATIONS - NOV'2024
SEMESTER - V
20UMACT5012 - Graph Theory

Total Duration : 2 Hrs.30 Mins. Total Marks : 60

Section B

Answer any **SIX** questions $(6 \times 5 = 30$ Marks)

1. Describe about a simple graph with example.
2. Describe about isomorphic graphs.
3. Give a short note about weighted graph with example.
4. Brief about bipartite graph with example.
5. Prove that let T be any tree on $k+1$ vertices. If $\sigma(G) \geq k$, then G contains a tree (isomorphic to)T.
6. Prove that for any connected planar graph G, $n - m + r == 2$ In polyhedral geometry, the formula is stated using symbols $V - E + F = 2$
7. Describe about vertex colouring and vertex chromatic numbers.
8. Prove that, we can color any chordal graph with $\omega(G)$colors using the greedy algorithm.

Section C

Answer any **THREE** questions $(3 \times 10 = 30$ Marks)

9. Prove that if G is simple and $\sigma(G) \geq 2$, then there exists a cycle of length of at least $\sigma(G) + 1$ in G and also draw a graph of path with 5 vertices.
10. State and prove the necessary condition for a graph to be Hamiltonian graph.
11. Prove that a graph G is a tree if and only if any two vertices are connected by a unique path.
12. Describe about various branch in characterizations of planar graph.
13. Find the vertex chromatic number of following graphs
    i) Petersen graph ii) A tree graph.

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