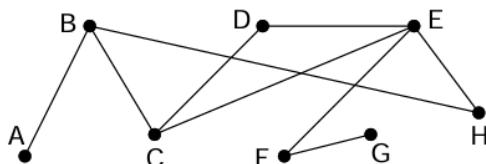
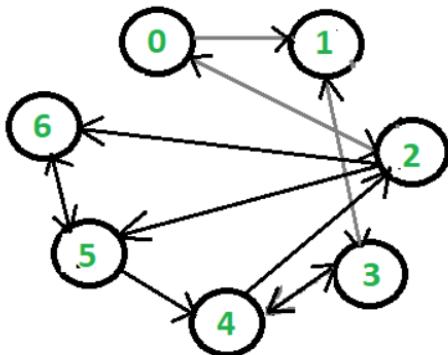


**Department of Mathematics**  
**25MT1002E: Discrete Mathematics**  
**I/IV-B. Tech-(ODD Sem), Academic Year: 2025-2026**  
**CO-4 :: HOME ASSIGNMENT-4**

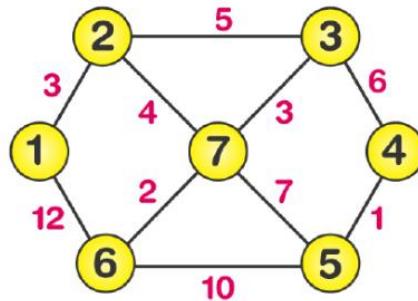
1. Solve the recurrence relation  $a_n = 3a_{n-1} + 10a_{n-2} + 5^n$ .
2. Solve  $a_n = a_{n-1} + a_{n-2} + 3$  using generating function technique where  $a_0 = 0, a_1 = 1$ .
3. A bacteria population doubles every hour. If the initial count is 150. Find a recurrence relation and express the number of bacteria after  $n$  hours.
4. If a graph has 10 vertices, each of degree 3, find the number of edges.
5. Determine the degrees of all vertices of the following graph:



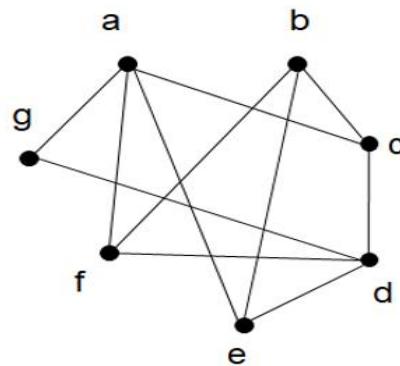
6. Tabulate the in-degrees and out-degrees of the following graph:



7. Write adjacency and incidence matrices for the following graph:



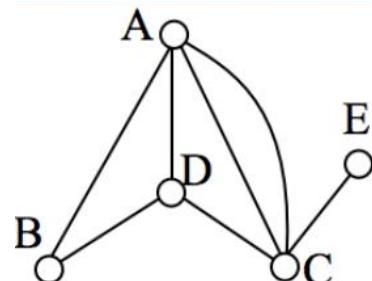
8. Determine whether the following graph is planar or not?



9. Draw the graph  $K_{3,4}$  and verify it is planar or not?

10. Give an example of a complete graph  $K_5$  and determine it is planar or not?

11. Determine whether the following is Euler graph or Hamilton graph. If so give path.



12. Determine the following graphs are Isomorphic or not?

