

Course/ Batch: BTech/ SCSET
Course Code: CSET244
Semester: Even
Session: 2024-2025

Course Type: Core
Course Name: Design and Analysis of Algorithms

Tutorial Assignment: Week 12

Tutorial title: Backtracking

CO Mapping

Question no	CO1	CO2	CO3
Q1	✓	✓	
Q2	✓	✓	
Q3	✓	✓	
Q4	✓	✓	

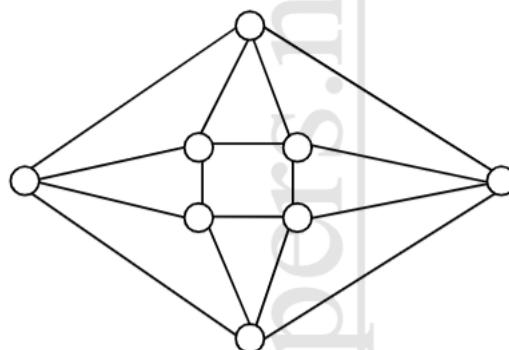
Q1 What among the alternatives makes the best solution/option, when considering the 4 queens problem?

- A. (2,3,1,4)
- B. (4,3,2,1)
- C. (3,1,4,2)
- D. (4,2,3,1)

Q2. The chromatic number of a graph is the minimum number of colours used in a *proper* colouring of the graph. Let G be any graph with n vertices and chromatic number k . Which of the following statements is/are always TRUE?

- A. G contains a complete subgraph with k vertices
- B. G contains an independent set of size at least n/k
- C. G contains at least $k(k-1)/2$ edges
- D. G contains a vertex of degree at least k

Q3 The minimum number of colours required to colour the following graph, such that no two adjacent vertices are assigned the same colour, is



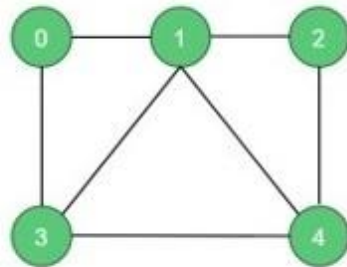
- A. 2
- B. 3
- C. 4
- D. 5

Q4. Let G be an undirected complete graph on n vertices, where $n > 2$. Then, the number of different Hamiltonian cycles in G is equal to

- A. $n!$
- B. $(n-1)!$
- C. 1
- D. $(n-1)!/2$

Q5 the given undirected graph $G(V, E)$ and its adjacency matrix are as follows –

0	1	0	1	0
1	0	1	1	1
0	1	0	0	1
1	1	0	0	1
0	1	1	1	0



The backtracking algorithm can be used to find a Hamiltonian path in the above graph. If found, the algorithm returns the path. If not, it returns false. Find the Hamiltonian path in the above graph.