Unit 7 - Week 6

Assignment-6

The due date for submitting this assignment has passed. Due on 2018-03-21, 23:59 IST.

Submitted assignment

1) The ____________ of a graph G, is the maximum size of a set of pairwise adjacent vertices in G.

- Clique number
- Independence number
- Critical number
- Vertex cover

No, the answer is incorrect.

Score: 0

Accepted Answers:
- Clique number

2) True or False?

For every graph G, \( \chi(G) \geq \omega(G) \) and \( \chi(G) \geq n(G)/\alpha(G) \)

Where, \( \chi(G) \) : chromatic number, \( \omega(G) \) : clique number, \( \alpha(G) \) : independence number

- True
- False

No, the answer is incorrect.

Score: 0

Accepted Answers:
- True

3) Match the following pairs:

1 point

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A. A proper k-coloring of a k-chromatic graph
B. If \( \chi(H) < \chi(G) = k \) for every proper subgraph \( H \) of \( G \)
C. Cartesian product
D. Relative to a vertex ordering \( v_1, \ldots, v_n \) of \( V(G) \),
   assigning to \( v_i \) the smallest-indexed color not already used on its lower-indexed neighbors.

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<td>1. Greedy coloring</td>
<td>2. ( G ) is color-critical or ( k )-critical</td>
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<td>3. Optimal coloring</td>
<td>4. Symmetric</td>
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- A-2, B-4, C-1, D-3
- A-2, B-3, C-1, D-4
- A-3, B-4, C-2, D-1
- A-3, B-2, C-4, D-1

No, the answer is incorrect.
Score: 0
Accepted Answers:
A-3, B-2, C-4, D-1

4) True or False? 1 point

In a vertex ordering, each vertex has at most \( \Delta(G) \) earlier neighbors,
so the greedy coloring cannot be forced to use more than \( \Delta(G) + 1 \) colors.
This proves constructively that \( \chi(G) \leq \Delta(G) + 1 \).

- True
- False

No, the answer is incorrect.
Score: 0
Accepted Answers:
True

5) If \( G \) is an interval graph, then 
where, \( \chi(G) \) : chromatic number, \( \omega(G) \) : clique number

- \( \chi(G) < \omega(G) \)
- \( \chi(G) > \omega(G) \)
- \( \chi(G) = \omega(G) \)
- None of the mentioned

No, the answer is incorrect.
Score: 0
Accepted Answers:
\( \chi(G) = \omega(G) \)

6) True or False? 1 point

If \( G \) is a connected graph other than a complete graph or an odd cycle,
then \( \chi(G) \leq \Delta(G) \)

- True
7) A graph $G$ with no isolated vertices is color-critical if and only if ________________

- $\chi(G - e) = \chi(G)$ for every $e \in E(G)$
- $\chi(G - e) > \chi(G)$ for every $e \in E(G)$
- $\chi(G - e) < \chi(G)$ for every $e \in E(G)$
- None of the mentioned

No, the answer is incorrect.
Score: 0
Accepted Answers:
True

8) What is the value of chromatic polynomial $\chi(C_4; 3)$ for counting proper $k$-colorings of $C_4$?

- 16
- 18
- 24
- 48

No, the answer is incorrect.
Score: 0
Accepted Answers:
18