Unit 10 - Week 8

Course outline

- **How does an NPTEL online course work?**
- **Week 0**
- **Week 1**
- **Week 2**
- **Week 3**
- **Week 4**
- **Week 5**
- **Week 6**
- **Week 7**
- **Week 8**
  - ○ Directed, weighted and multi graphs
  - ○ Illustration of Directed, weighted and multi graphs
  - ○ Graph representations - Introduction
  - ○ Adjacency matrix representation
  - ○ Incidence matrix representation
  - ○ Isomorphism - Introduction
  - ○ Isomorphic graphs - An illustration
  - ○ Isomorphic graphs - A challenge
  - ○ Non - isomorphic graphs
  - ○ Isomorphism - A question
  - ○ Complement of a Graph - Introduction
  - ○ Complement of a Graph - Illiustration
  - ○ Self complement
  - ○ Complement of a disconnected graph is connected
  - ○ Complement of a disconnected graph is connected - Solution
  - ○ Which is more? Connected graphs or disconnected graphs?
  - ○ Bipartite graphs
  - ○ Bipartite graphs - A puzzle
  - ○ Bipartite graphs - Converse part of the puzzle
  - ○ Definition of Eulerian Graph
  - ○ Illustration of eulerian graph
  - ○ Non- example of Eulerian graph
  - ○ Litmus test for an Eulerian graph
  - ○ Why even degree?
  - ○ Proof for even degree implies graph is eulerian
  - ○ A condition for Eulerian trail
  - ○ Why the name Eulerian
  - ○ Can you traverse all location?
  - ○ Defintion of Hamiltonian graphs
  - ○ Examples of Hamiltonian graphs
  - ○ Hamiltonian graph - A result
  - ○ A result on connectedness
  - ○ A result on Path
  - ○ Dirac's Theorem
  - ○ Dirac's theorem - A note
  - ○ Ore's Theorem
  - ○ Dirac's Theorem v/s Ore's Theorem
  - ○ Eulerian and Hamiltonian Are they related
  - ○ Importance of Hamiltonian graphs in Computer science
  - ○ Constructing non intersecting roads
  - ○ Definition of a Planar graph
  - ○ Examples of Planar graphs
  - ○ V - E + R = 2
  - ○ Illustration of V - E + R =2
  - ○ V - E + R = 2; Use induction
  - ○ Proof of V - E + R = 2
  - ○ Famous non-planar graphs
  - ○ Litmus test for planarity
  - ○ Planar graphs - Inequality 1
  - ○ 3 Utilities problem - Revisited
  - ○ Complete graph on 5 vertices is non-planar - Proof
  - ○ Prisoners and cells
  - ○ Prisoners example and Proper coloring
  - ○ Chromatic number of a graph
  - ○ Examples on Proper coloring
  - ○ Recalling the India map problem
  - ● Recalling the India map problem - Solution
  - ○ **Quiz : Assignment 8**
  - ○ Week 8 Feedback
- **Week 9**
- **Week 10**
- **Week 11**
- **Week 12**
- **Text Transcripts**
- **Download Videos**

Assignment 8

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2020-03-25, 23:59 IST.

1) Let $K_{m,n}$ represent a complete bipartite graph, where m and n are positive integers. What is the chromatic number of this graph? ***1 point***

○ n
○ m
○ 1
○ 2

No, the answer is incorrect.
Score: 0
Accepted Answers:
2

2) Which of the following graphs is planar? ***1 point***

○ K_5
○ $K_{3,3}$
○ K_6
○ K_4

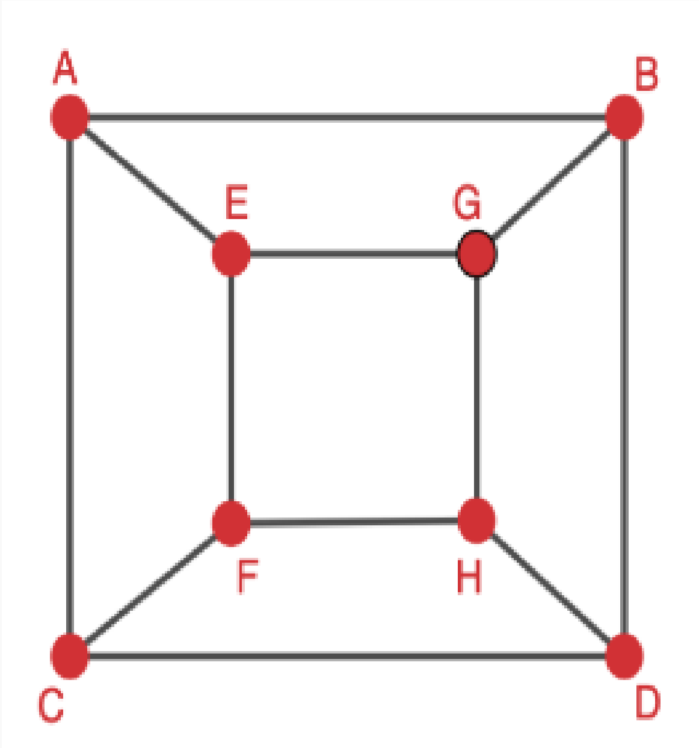
No, the answer is incorrect.
Score: 0
Accepted Answers:
K_4

3) How many edges are there in complement of P_6 (path on 6 vertices)? ***1 point***

○ 9
○ 5
○ 10
○ None of the above

No, the answer is incorrect.
Score: 0
Accepted Answers:
10

4) Chromatic number of hypercube graph Q_3 (shown in figure below) is : ***1 point***



○ 8
○ 5
○ 2
○ 3

No, the answer is incorrect.
Score: 0
Accepted Answers:
2

5) $K_{2,2}$ is isomorphic to C_4 . ***1 point***

○ True
○ False

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

6) Which of the following graphs is NOT Hamiltonian? ***1 point***

○ K_n
○ C_n , cycle on n vertices.
○ $K_{10,9}$.
○ None of the above.

No, the answer is incorrect.
Score: 0
Accepted Answers:
$K_{10,9}$.

7) Let e be the number of edges, v be the number of nodes and r be the number of regions of a planar graph. Then which of the following inequalities hold true? ***1 point***

○ 3e < 2r
○ 3r ≤ 2e
○ 3r < 2v
○ None of the above

No, the answer is incorrect.
Score: 0
Accepted Answers:
3r ≤ 2e

8) Every graph has —— number of odd degree vertices. ***1 point***

○ Even
○ Zero
○ Odd
○ Cannot say

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

9) Which of the following graphs is self-complementary? ***1 point***

○ C_6
○ P_4
○ P_5
○ None of the above

No, the answer is incorrect.
Score: 0
Accepted Answers:
P_4

10) If G is a 3-regular, connected, simple, planar graph with 18 vertices,then, the number of regions in G are ——? ***1 point***

○ 10
○ 38
○ 20
○ 11

No, the answer is incorrect.
Score: 0
Accepted Answers:
11