

# Unit 3 - Week 1

## Course outline

How does an NPTEL online course work?

### Week 0

Lecture 1 Part 1 - Basic Concepts

Lecture 1 Part 2 - Basic Concepts

Lecture 2 Part 1 - Eulerian and Hamiltonian Graph

Lecture 2 Part 2 - Eulerian and Hamiltonian Graph

### Week 1

#### Quiz : Assignment 1

Week 1 Feedback : Graph Theory

Assignment 1 solution

### Week 2

### Week 3

### Week 4

### Week 5

### Week 6

### Week 7

### Week 8

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## Assignment 1

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

**Due on 2020-02-12, 23:59 IST.**

1) If  $G$  be a simple graph on  $n$  vertices with  $\Delta(G) = \lceil \frac{n}{2} \rceil$  and  $\delta(G) = \lfloor \frac{n}{2} \rfloor - 1$ , then

1 point

- $G$  is connected
- $G$  is disconnected

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
 $G$  is connected

2) Does there exist a graph with the following degree sequence:

1 point

3, 3, 3, 3, 5, 6, 6, 6, 6, 6

- Yes
- No

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
No

3) Does there exist a simple Eulerian graph on 6 vertices and 7 edges.

1 point

- Yes
- No

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
Yes

4) A graph is semi-Eulerian if it contains a trail (possibly open) that includes all edges. A graph is semi-Eulerian if and only if it contains

1 point

- two vertices of odd degree
- four vertices of odd degree
- no vertex of odd degree

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
two vertices of odd degree

5) Notation:  $c(G - S)$  denotes the number of components of  $G - S$ . If  $G$  is Hamiltonian, then for every proper subset  $S$  of  $V(G)$ , we must have

1 point

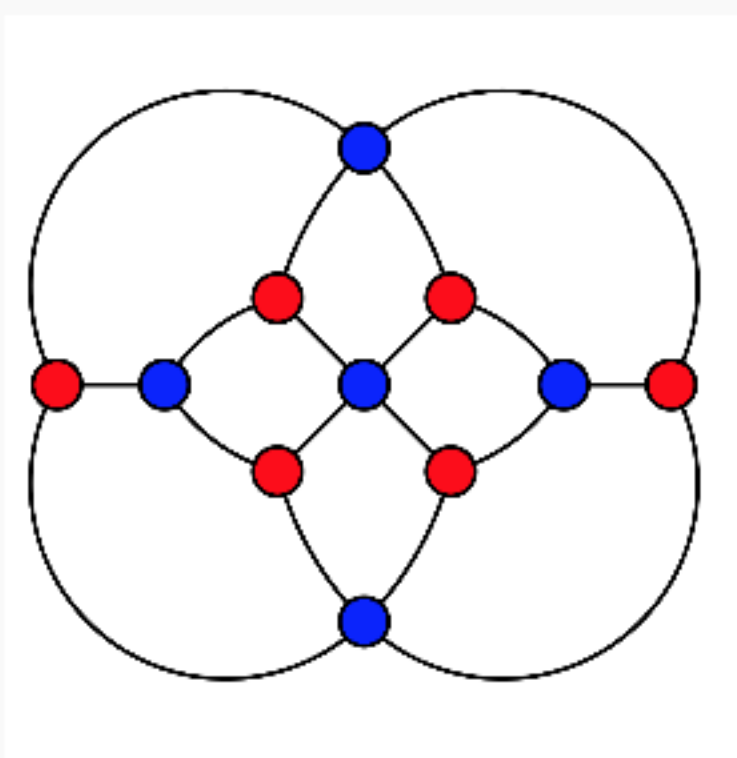
- $c(G - S) \leq |S|$
- $c(G - S) > |S|$

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
 $c(G - S) \leq |S|$

6) Does the following graph have a Hamiltonian cycle?

1 point



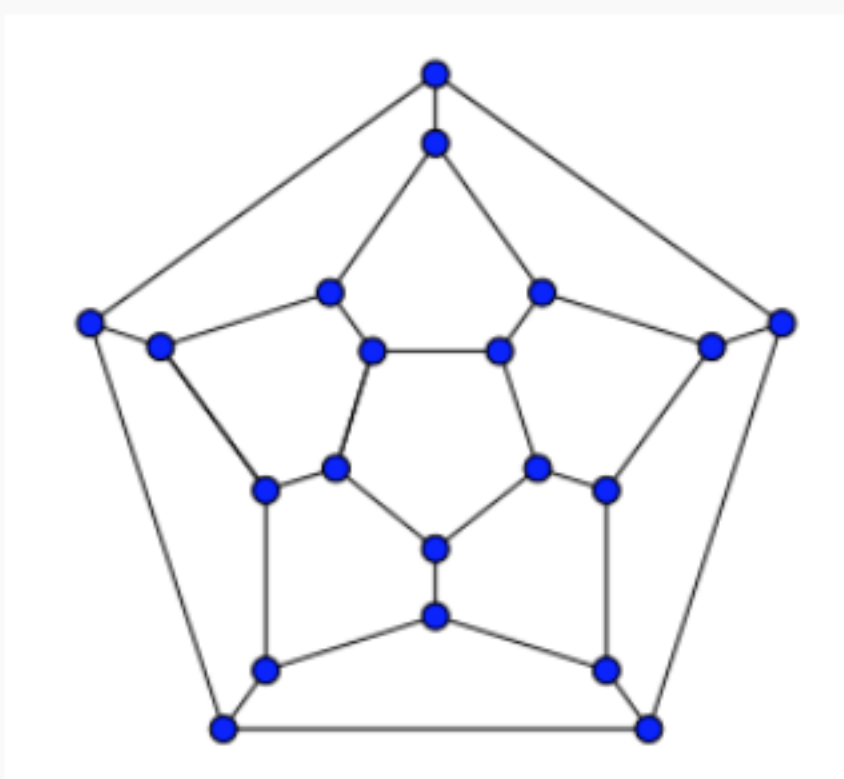
- Yes
- No

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
No

7) Is the following graph Hamiltonian?

1 point



- Yes
- No

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
Yes

8) Is  $K_{m,n}$  Hamiltonian when  $m + n$  is odd? Notation:  $K_{m,n}$  is the complete bipartite graph with  $m$  vertices in one part and  $n$  vertices in the other part.

1 point

- Yes
- No

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
No