Unit 5 - Week 4: Graph Theory

Assignment 4

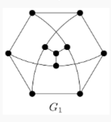
The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

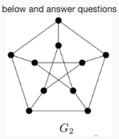
Due on 2019-08-28, 23:59 IST.

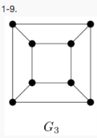
Instructions:

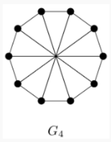
- This question paper has 10 questions.
- Each question can have multiple correct options. Your answer will be treated as correct only if all the correct options are bubbled. Correct responses will be awarded 4 marks. Incorrect responses and Unattempted questions will be awarded 0 marks

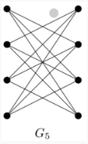
Consider the graphs shown below and answer questions 1-9.

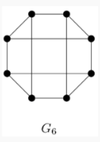












1) Which of the following pairs of graphs are isomorphic? *4 points*

- [ ] G1 , G2
- [ ] G1 , G4
- [ ] G2 , G3
- [ ] G3 , G6
- [ ] G3 , G5

No, the answer is incorrect.
Score: 0

Accepted Answers:
G1 , G2
G3 , G6
G3 , G5

2) Which of the following graphs are not Eulerian? *4 points*

- [ ] G1
- [ ] G3
- [ ] G5
- [ ] G6

No, the answer is incorrect.
Score: 0

Accepted Answers:
G1
G3
G5
G6

3) Which of these of graphs contain a Hamiltonian cycle? *4 points*

- [ ] G1
- [ ] G2
- [ ] G5
- [ ] G3

No, the answer is incorrect.
Score: 0

Accepted Answers:
G5
G3

4) What is the minimum number of edges that needed to be removed to make any one of the above graphs disconnected? *4 points*

- ( ) 1
- ( ) 2
- ( ) 4
- ( ) 3

No, the answer is incorrect.
Score: 0

Accepted Answers:
3

5) Which of these of graphs are bipartite? *4 points*

- [ ] G1
- [ ] G2
- [ ] G3
- [ ] G6
- [ ] G5

No, the answer is incorrect.
Score: 0

Accepted Answers:
G3
G6
G5

6) Which of these of graphs have the least chromatic number? *4 points*

- [ ] G1
- [ ] G2
- [ ] G3
- [ ] G6
- [ ] G4

No, the answer is incorrect.
Score: 0

Accepted Answers:
G3
G6
G4

7) Consider graphs whose vertices are numbered 1 to n. A sequence of n numbers {a i : 1 ≤ i ≤ n} is called a degree sequence if a i is the degree of vertex i. Which of the following sequences are degree sequences for some graph? *4 points*

- [ ] 1, 2, 3, 2, 3, 2
- [ ] 3, 3, 3, 3, 3
- [ ] 2,4, 6, 8, 10, 11, 9
- [ ] 1, 2, 1, 2, 1, 2, 1, 2
- [ ] 3, 3, 3, 3, 3, 3

No, the answer is incorrect.
Score: 0

Accepted Answers:
1, 2, 1, 2, 1, 2, 1, 2
3, 3, 3, 3, 3, 3

8) Which of the following statements are true? *4 points*

- [ ] G2 is a 3 regular graph.
- [ ] For every n, any connected 2 regular graph on n vertices are isomorphic
- [ ] For every n, any connected 3 regular graph on n vertices are isomorphic
- [ ] G5 is a 2 regular graph.

No, the answer is incorrect.
Score: 0

Accepted Answers:
G2 is a 3 regular graph.
For every n, any connected 2 regular graph on n vertices are isomorphic

9) Assume the edges of the graph G2 were given distinct positive integer weights. Let m be the weight of its minimal spanning tree. Which of the following statements are true? *4 points*

- ( ) m ≤ 120
- ( ) m ≤ 45
- ( ) m ≥ 120
- ( ) m ≥ 45

No, the answer is incorrect.
Score: 0

Accepted Answers:
m ≥ 45

10) Let G be a weighted connected graph. Assume that the weights are all distinct positive integers. Which of the following statements are true? *4 points*

- [ ] The least weighted edge is part of every minimal spanning tree
- [ ] The maximum weighted edge is not part of any minimal spanning tree
- [ ] The second smallest weighted edge is part of every minimal spanning tree
- [ ] The n-1 heaviest edges cannot be part of any minimal spanning tree

No, the answer is incorrect.
Score: 0

Accepted Answers:
The least weighted edge is part of every minimal spanning tree
The second smallest weighted edge is part of every minimal spanning tree