Unit 7 - Week 5

Assignment 5

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

Due on 2020-03-04, 23:59 IST.

1) Consider the following instance: *1 point*

m_1	w_1	w_2	w_3	w_4
m_2	w_1	w_4	w_3	w_2
m_3	w_2	w_1	w_3	w_4
m_4	w_4	w_2	w_3	w_1

Table 1: Men's preference

w_1	m_4	m_3	m_1	m_2
w_2	m_2	m_4	m_1	m_3
w_3	m_4	m_1	m_2	m_3
w_4	m_3	m_2	m_1	m_4

Table 2: Women's preference

Is the matching $M = \{(m_1, w_4), (m_2, w_3), (m_3, w_1), (m_4, w_2)\}$ a stable matching?

- Yes
- No

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

2) Consider the instance in Problem 1. The man-oriented stable matching obtained by Gale-Shapley algorithm is *1 point*

- $\{(m_1, w_1), (m_2, w_4)(m_3, w_3)(m_4, w_2)\}$
- $\{(m_1, w_3), (m_2, w_4)(m_3, w_2)(m_4, w_1)\}$
- $\{(m_1, w_3), (m_2, w_4)(m_3, w_1)(m_4, w_2)\}$

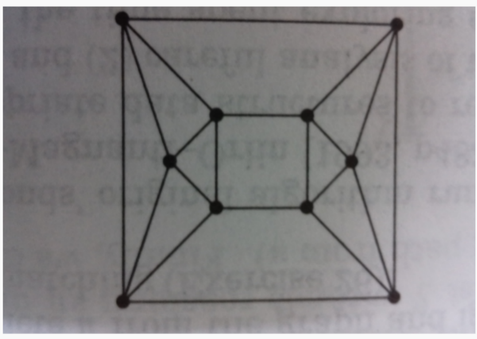
No, the answer is incorrect.
Score: 0
Accepted Answers:
$\{(m_1, w_3), (m_2, w_4)(m_3, w_1)(m_4, w_2)\}$

3) Consider the instance in Problem 1. The woman-oriented stable matching obtained by Gale-Shapley algorithm is *1 point*

- $\{(w_1, m_3), (w_2, m_4)(w_3, m_1)(w_4, m_2)\}$
- $\{(w_1, m_3), (w_2, m_4)(w_3, m_2)(w_4, m_1)\}$
- $\{(w_1, m_4), (w_2, m_2)(w_3, m_1)(w_4, m_3)\}$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$\{(w_1, m_3), (w_2, m_4)(w_3, m_1)(w_4, m_2)\}$

4) A k-factor of a graph G is a k-regular spanning subgraph of G. So, a perfect matching of a graph G is a 1-factor of G. Does the graph below has a 2-factor? *1 point*



- Yes
- No

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

5) Consider the graph shown in Problem 4. Does the graph have a 3-factor? *1 point*

- Yes
- No

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

6) Does every 4-regular simple graph have a perfect matching? *1 point*

- Yes
- No

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

7) Let G be a connected 3-regular graph. Each edge of G lies on some cycle. Let $S \subseteq V$, and $C_1, C_2, \ldots, C_m$ be the odd components of $G - S$. Let $e(C_i, S)$ denote the number of edges with one endpoint in C_i and other endpoint in S. Then $e(C_i, S)$ is *1 point*

- odd
- even
- cannot say

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

8) Consider the graph in Problem 7. Then $\sum_{i=1}^{m} e(C_i, S)$ *1 point*

- less than m
- greater than or equal to $4m$
- greater than or equal to $3m$

No, the answer is incorrect.
Score: 0
Accepted Answers:
greater than or equal to 3m