

Unit 7 - week 4

Course outline

How does an NPTEL online course work?

Prerequisite Assignment

MATLAB

Week 1

Week 2

Week 3

week 4

● 28 - Network Biology: Recap

○ 29 - Lab: Network Models & Perturbations

○ 30 - Lab: Network Models & Perturbations

○ 31 - Reconstruction of Gene Regulatory Networks

○ 32 - Reconstruction of Protein Networks

○ 33 - Reconstruction of Signalling Networks

○ 34 - Reconstruction of Metabolic Networks

○ Quiz : Practice Assignment 4

○ Quiz : Assignment 4

○ Computational Systems Biology : Week 4 Feedback Form

Week 5

Week 6

Week 7

Week 8

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Week 11

Week 12

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Assignment 4

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

Due on 2020-02-26, 23:59 IST.

1) Given a stoichiometric matrix S of dimensions $a \times b$

1 point

- Number of metabolites are a
- Number of metabolites are b
- Number of reactions are a
- If v is the vector of fluxes, $S.v = 0$ at steady state

No, the answer is incorrect.
Score: 0

Accepted Answers:
Number of metabolites are a
If v is the vector of fluxes, $S.v = 0$ at steady state

2) Consider the following phylogenetic profile for five proteins, across four organisms:

1 point

	A	B	C	D	E
0	1	0	1	1	
0	0	1	0	1	
0	1	0	1	1	
1	1	0	1	1	

Which of the following statements is/are true?

- B and C are "complementary" proteins
- E is a conserved protein
- A and C proteins always occur together but do not participate in the same pathway
- B and D always occur together and are likely required for the functioning of the same pathway

No, the answer is incorrect.
Score: 0

Accepted Answers:
B and C are "complementary" proteins
E is a conserved protein
B and D always occur together and are likely required for the functioning of the same pathway

Consider a toy model with 5 essential reactions namely R_1, R_2, R_3, R_4, R_5 . The GPRs for each of the reaction is given below:

- a) $R_1 = \text{gene 1 or gene 2}$
- b) $R_2 = \text{gene 3}$
- c) $R_3 = \text{gene 1 and (gene 4 or gene 3)}$
- d) $R_4 = \text{gene 4 or gene 5}$
- e) $R_5 = \text{gene 5 and gene 6}$

3) If gene 4 and gene 5 are knocked out what reactions will be inactive?

1 point

- R_1
- R_2
- R_3
- R_4
- R_5

No, the answer is incorrect.
Score: 0

Accepted Answers:
 R_4
 R_5

4) If only R_2 and R_3 are essential reactions what is the minimal set of genes required for the organism to survive?

1 point

- gene 1
- gene 2
- gene 3
- gene 4
- gene 5
- gene 6

No, the answer is incorrect.
Score: 0

Accepted Answers:
gene 1
gene 3

$G(n,e)$ is a graph with nodes: $n = \{a, b, c, d, e, f\}$ and edges: $e = \{(a,b), (a,d), (b,c), (b,d), (b,e), (b, f), (c,e)\}$

5) The height of the tallest bar in the histogram of the degree distribution of G is:

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Numeric) 4

1 point

6) The highest degree that a node has in G is:

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Numeric) 5

1 point

7) "Programming assignment: Construct a regular lattice with 100 nodes, where each node is connected to 12 nearest neighbours. What is the characteristic path length of this lattice? Enter your answer, correct up to 2 decimals

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 4.40,4.80

2 points

8) For the above lattice, what is the clustering coefficient? Enter your answer, correct up to 2 decimals

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 0.66,0.70

2 points