X

Unit 4 - Week 3

Week 3 Assessment

The due date for submitting this assignment has passed. Due on 2017-08-16, 23:59 IST.
As per our records you have not submitted this assignment.

1) What happens to the vector v when multiplied with the matrix A? *1 point*

$$A = \begin{bmatrix} 0 & 1 \\ -2 & -3 \end{bmatrix}, v = \begin{bmatrix} 1 \\ 1 \end{bmatrix}$$

- Both magnitude and direction changes
- Magnitude is changed only
- Remains the same
- Only direction changes

No, the answer is incorrect.
Score: 0

Accepted Answers:
Both magnitude and direction changes

2) What happens to the vector v when multiplied with the matrix A? *1 point*

$$A = \begin{bmatrix} 0 & 1 \\ -2 & -3 \end{bmatrix}, v = \begin{bmatrix} 1 \\ -2 \end{bmatrix}$$

- Remains the same
- Magnitude is changed only
- Both magnitude and direction changes
- Only direction changes

No, the answer is incorrect.
Score: 0

Accepted Answers:
Both magnitude and direction changes

3) For a system, $Mx = y$, if x and y are i)_____, then x is an ii)_____ of M, and $|y|/|x|$ the iii)_____. *1 point*

- i) eigen vectors, ii) eigen value, iii) collinear.
- i) collinear, ii) eigen vector, iii) eigen value.
- i) eigen values, ii) eigen vector, iii) collinear.
- i) collinear, ii) eigen value, iii) eigen vector.

No, the answer is incorrect.
Score: 0

Accepted Answers:
i) collinear, ii) eigen vector, iii) eigen value.

4) Tick all the properties of mutation matrix Q. *1 point*

$\sum_{i=1}^{n} = q_{ij} = 1$ (because all the elements together represents the total sample space).

All the entries are greater than 1 (because they are probabilities).

$\sum_{j=1}^{n} = q_{ij} = 1$ (because all the elements together represents the total sample space).

$q_{ij} \in [0, 1]$, all the entries are between 0 and 1 (because they are probabilities).

No, the answer is incorrect.
Score: 0

Accepted Answers:
$q_{ij} \in [0, 1]$, *all the entries are between 0 and 1 (because they are probabilities).*
$\sum_{j=1}^{n} = q_{ij} = 1$ *(because all the elements together represents the total sample space).*

5) What is the process of information transfer from RNA to Protein called? ***1 po***

- Transcribing
- Translation
- Transliteration
- Transcription

No, the answer is incorrect.
Score: 0

Accepted Answers:
Translation

6) Which of the following is true for the DNA to Protein translation code? ***1 point***

- An RNA doublet combinatorial code can account for all the natural amino acids.
- The number of letters in the two languages do not match and hence require a combinatorial code.
- The RNA triplet combinatorial code cannot account for all the known amino acids.
- The RNA triplet combinatorial code does not have a one to one relationship, and thus leads to degeneracy.

No, the answer is incorrect.
Score: 0

Accepted Answers:
The number of letters in the two languages do not match and hence require a combinatorial code.
The RNA triplet combinatorial code does not have a one to one relationship, and thus leads to degenerac

7) What is degeneracy in the genetic code? ***1 point***

- Some triplet codes not denoting any amino acids.
- Many different amino acids corresponding to one triplet code.
- Many different triplet combinatorial codes denoting one amino acid.
- One triplet combinatorial code coding for many amino acids.

No, the answer is incorrect.
Score: 0

Accepted Answers:
Many different triplet combinatorial codes denoting one amino acid.

8) Given a hypothetical sequence made from N alphabets and has length 20, what is the size of the sequence space? ***1 point***

- N^{20}
- 20^{N}
- None of the choices.
- $20 \cdot N$

No, the answer is incorrect.
Score: 0

Accepted Answers:
N^{20}

9) Given the sequences, sort them such that each has only one mutation difference between them. ***1 point***

- CAAAGT -> CAAGGT -> TAAGAT -> TAAGAA -> CAAGAT
- CAAAGT -> CAAGAT -> TAAGAT -> TAAGAA -> CAAGGT
- CAAAGT -> CAAGGT -> CAAGAT -> TAAGAT -> TAAGAA
- CAAAGT -> CAAGGT -> CAAGAT -> CAAAGT -> TAAGAT

No, the answer is incorrect.
Score: 0

Accepted Answers:
CAAAGT -> CAAGGT -> CAAGAT -> TAAGAT -> TAAGAA

10) How many other nodes does one node connect to, in the sequence space of a L amino acids long sequence? ***1 point***

- 19^{L}
- 20L
- L^{19}
- 19L

No, the answer is incorrect.
Score: 0

Accepted Answers:
19L

11) For a DNA sequence, calculate the fraction of nodes as neighbours: $\frac{3L}{4^{L}-1)}$, given L = 1 and 5. Comment on the nature of a graph between the fraction vs L. ***1 point***

- 0.015 and 1. As L increases, the fraction of neighbour nodes sharply increases, thus a larger sequence is more densely connected.
- 1 and 0.015. As L increases, the fraction of neighbour nodes sharply decreases, thus a larger sequence is more sparsely connected.
- 0.015 and 1. As L decreases, the fraction of neighbour nodes sharply increases, thus a smaller sequence is more densely connected.
- 1 and 0.015. As L increases, the fraction of neighbour nodes sharply increases, thus a larger sequence is more densely connected.

No, the answer is incorrect.
Score: 0

Accepted Answers:
1 and 0.015. As L increases, the fraction of neighbour nodes sharply decreases, thus a larger sequence is more sparsely connected.

12) Select examples of beneficial, lethal, neutral, deleterious mutations (in that order), from the list below. Given the starting population has fitness 2. ***1 point***

- 3, 0, 2, 1
- 10, 0, 3, 0.5
- 2.5, 1, 2.2, 1
- 10, 0, 2, -1

No, the answer is incorrect.
Score: 0

Accepted Answers:
3, 0, 2, 1

13) What is the most common value of fitness on a fitness landscape, and why? ***1 point***

- Negative one, because most sequences do not support life.
- One, because most sequences have the same fitness.
- Zero, because most sequences are arbitrary and hence are not viable.
- No value can repeat on a fitness landscape.

No, the answer is incorrect.
Score: 0

Accepted Answers:
Zero, because most sequences are arbitrary and hence are not viable.

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