

Exam 1 (100 pts)

Name: _____

1. Match the following words and descriptions:

- a. Bioinformatics
- b. Computational biology

 a Developing computational tools and techniques for biological data analysis b Using computational tools to analyze biological data

2. Which of the following is not a probable genomics application:

- a. Sequencing the human genome
- b. Sequencing the *C. elegans* genome
- c. Measuring gene expression on a genome-wide scale
- d. Sequencing a single gene in two different people

3. Why is special computer training needed to analyze genomic data?

- a. The datasets are often very large and complex
- b. Graphical user interface-based software often limits the ability to do custom analyses
- c. Methodologies and technologies are often pioneered in academic labs using command line-based software
- d. All of the above

4. Match the following words and descriptions:

- a. Hard drive/solid state drive
- b. Processor
- c. Keyboard
- d. RAM

 a Long term storage d Temporary volatile storage c The thing you type on b Performs computational tasks5. The following text is in what common sequence format? fasta

```
>mc1r
ACACGTAGCTATTCATCGTGATTTCGACTACGTACGACGGACTACTATCTACGGACTACTTACGGCGAGCTCAACACGTAGCTA
TTCATCGTGATTTCGACTACGTACGACGGACTACTATCTACGGACTACTTACGGCGAGCTCAACACACGTAGCTATTCATCGTG
ATTTCGACTACGTACGACGGACTACTATCTACGGACTACTTACGGCGA
```

6. Alignment of two sequences to one another is an example of a pairwise sequence alignment.

- a. True
- b. False

7. What type of sequence alignment is shown below?

- a. Local alignment
- b. Global alignment

```
ACTGACCACGTCACAGGCTAGG
||  |  |  |||||  |||
AC---C-AGGTCAC-----AGG
```

8. The local alignment program _____ **blast** _____ is used to query a sequence against a database of sequences.

9. A deletion or insertion of DNA at a particular genomic locus is an example of which of the following types of mutations:

- a. SNP
- b. Indel
- c. Neither of the above
- d. a and b

10. What unix command is commonly used to change directories? _____ **cd** _____

11. What is a unix command that could be used to view the contents of a file in the terminal (there is more than one correct answer)? _____ **more or less or cat** _____

12. What unix command is commonly used to print something to the terminal? _____ **echo** _____

13. What unix command is used to display the working directory? _____ **pwd** _____

14. What unix command is used to list the contents of a directory? _____ **ls** _____

15. Which of the following commands is used to change the permissions on a file or directory:

- a. **chmod**
- b. ls
- c. cd
- d. rm
- e. pwd

16. Which of the following commands is used to remove a file:

- a. chmod
- b. ls
- c. cd
- d. **rm**
- e. pwd

17. What unix command is commonly used to pass a string or value contained in a variable to another command from the command line? _____ **echo** _____

18. Which of the following symbols is used to pipe the output from one command to another:

- a. &
- b. \$
- c. %
- d. |**
- e. >

19. Which of the following unix commands is used to make a new directory?

- a. mkdir**
- b. makedirectory
- c. md
- d. make
- e. newdir

20. Which of the following unix commands is used to list the contents of a directory?

- a. touch
- b. ls**
- c. more
- d. rm
- e. read

21. What software is needed to run the following script?

```
read -p 'Enter your name: ' name  
echo Hello, $name
```

- a. Bash shell**
- b. Python
- c. Microsoft Word
- d. Python and Bash shell

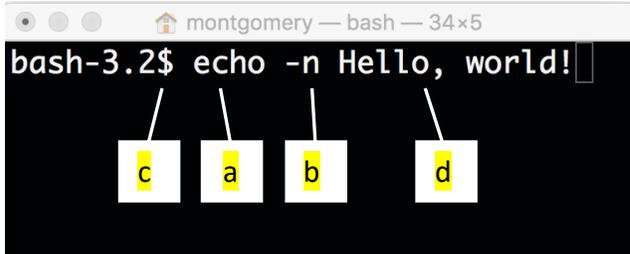
22. Which of the following is the most accurate description of a script:

- a. A computer program**
- b. A graphical user interface
- c. A shell
- d. A unix command

23. Which of the following is a text editor that is commonly used when writing scripts:

- a. Microsoft Word
- b. TextEdit
- c. TextWrangler**
- d. Bash

24. Use the following list to label the parts of a unix command in the terminal below:
- Command
 - Options
 - Prompt
 - Arguments



25. What file extension is commonly used for bash scripts: .sh
26. What file extension is commonly used for Python scripts: .py
27. tr is a unix command for making simple text substitutions.
- True
 - False
28. Which of the following is an accurate description of Python:
- A high-level interpreted programming language
 - A programming language that uses unix commands and syntax
 - A low level compiled language
 - A programming language specifically for bioinformatics and computational biology
29. Describe a while loop as if you were explaining it to someone without any programming experience (i.e. don't use any programming language specific jargon):

A while loop is block of computer code that repeats a task.

30. Which of the following is an example of a python function we covered in class:
- read()
 - print()
 - input()
 - b and c

31. The following statement assigns the value ATCG to the variable seq. Would the syntax work for unix, python, or both?

```
seq='ATCG'
```

- a. Unix
- b. Python
- c. Unix and Python

32. The following statement assigns the value 5 to the variable num. Would the syntax work for unix, python, both, or neither (note the spaces in the statement)?

```
num = 5
```

- a. Unix
- b. Python
- c. Unix and python
- d. Neither unix or python

33. When are quotes needed within the print() function in python?

- a. Always
- b. Around things you want treated literally, such as strings
- c. Around variables and other things you want evaluated
- d. Never