Student Name	
Student ID	

Question 1: Provide a short answer for each of the following terms. Your answer must fit within the space provided in the table. [20 points, 2 points for each definition]

QUESTION	ANSWER
What was the strategy behind the Utilities part of the OS architecture?	Minimize the OS use of RAM by placing commands on disk. They are loaded only when needed and stay in memory only as long as needed.
What does O and o do in escape mode in vi or vim?	Capital O creates a new line above the current line. Little o creates a new line below the current line.
What does the following mean: ~ / .. and . in Unix?	~ user's home directory, / the root directory, .. the parent directory, . the current directory.
How can I set the following permission rw-------	Chmod 600
If in a script we output echo $0 what is displayed?	The name of the program or the command.
What is the Unix session?	It is the programs and data structures that are active once a user logs into the server and ends when the user logs out. Commonly this would include the shell and the shell memory plus any additional programs launched from there.
Define redirection	Causing data that was intended for STDOUT and STDIN to be directed instead to another destination, like a file or another program.
What is different about System Programming compared to other programming?	System program is lower level and interacts more closely with the operating system, drivers and hardware in a more direct manner. Fewer abstractions separate the programmer from the machine.
In Bash how do I compute 5 + 2 ?	Expr 5+2
Write a one line command-line expression that displays which of your friends are logged in, assuming the names of your friends are in friends.txt	TYPO !! Give students +2

Question 2: Write the following Bash program in the space provided [20 points]

A developer wants to use a backup command that copies a list of verified files into a backup directory in the current directory she is in. The developer wants the backup script to have the following syntax:

./validate list-of-files

Where:

- ./verify is the name of the script
- list-of-files is a list of space-separated file names with wild characters

For example:

```
./verify readme.txt *.c
```

The above asks to copy the readme.txt file and all the .c files from the current directory to a directory called backup that exists in the current directory, but only if the file exists.

The program assumes a directory called backup already exists within the current directory. Each file in the list is copied into the backup directory only if it exists. If it does not exist the file is skipped. This test is also carried out on each of the files from the wild card. The program terminates early if the user does not provide at least one command-line argument, displaying an ASCII error message.

The student should write something that roughly follows this pattern. They could have used other loops. This is graded proportionally compared to working code and following the above instructions.

```
1.  #!/bin/bash                          # sheband for bash
2.  If ($# .lt. 1)                       # check for two command-line arguments
3.    Then echo "./verify files"; exit 1 # error out with message & code
4.  fi
5.  While ($# .gt. 0); do
6.      Files=`ls $1`
7.      For f in Files; do
8.        If (-r $f)
9.          Then cp $1 backup
10.       Fi
11.     done
12.     Shift
13. Done
14. Exit 0
```