You may use your crib sheet only (one HANDWRITTEN 8-1/2 x 11 page both sides). You will have the whole class period, unless you get time-and-a-half. Spend only about one minute per point on each question to complete the exam on time.

1. **General Computer Knowledge (10 Points: a and b for 2 points each; c and d for 3 points each)**

   a. Indicate the **type** for each of these values:

   - 17
   - 19.8
   - “Hello world”

   b. Give an example of a valid method call that converts a value of one type to a value of another type.

   c. Why is it necessary to maintain code indentation in Python?

   d. How is a command line interface (CLI) different from a graphical user interface (GUI)?

2. **Python Identifiers and Their Meaning (10 Points)**

   For each of the following, indicate if it is a valid Java identifier or not. If it is valid, explain what it would identify using the normal naming conventions. If it is not valid, explain why it is not valid.

   **Identifier** | **Valid(Yes/No)** | **Explanation**
   --- | --- | ---
   foobar | | |
   123abc | | |
   ca$h | | |
   False | | |
   STATES | | |
3. Expression Evaluation (20 Points)

```python
import random

b1 = True
b2 = False
b3 = (random.random() < 0.5)
int1 = 4
int2 = 7
s1 = "hey"
s2 = "there"

# Show what is printed for at least 10 of the
# 12 following statements

print (int1 + int2)                       # a. ____________
print (int1 // int2)                      # b. ______________
print (int2 / float (int1))               # c. ______________
print (not b1 or b2)                      # d. ______________
print (not b1 or not b2)                  # e. ______________
print (str (int2 * 3 + int1) + s1 + s2)   # f. ______________
print (str (0 - int1) + "9" + str (b1))   # g. ______________
print (int2 % int1 > 2 and (b3 or b1))    # h. ______________
print (s2 + str (int2 * 3))               # i. ______________
print (s1 + str (int2 < int1 * 2 or b2))  # j. ______________
print (s2 + str (b1 or b2))               # k. ______________
print (s1 + str (int2/int1 <= 1 or b2))   # l. ______________
```
What is or is not printed by the following code segment?

\[
\text{ok} = "Okay" \\
\text{no} = "Nope" \\
\alpha = 23 \\
\beta = 14 \\
\zeta = 0.0
\]

# Printed? (Yes or No)

```python
if \alpha \geq \beta:
    \text{print}("It's all Greek to me")  # a.
if \alpha == 2 * \beta:
    \text{print}("Gamma")  # b.
if ok == no:
    \text{print}("Delta")  # c.
else:
    \text{print}("Epsilon")  # d.
\text{print}("Phi")  # e.

new_var = \alpha - \beta + \text{int}(\zeta)

if new_var == 0:
    \text{print}("Pi")  # f.
elif new_var == \text{ord}(\text{"A")}:
    \text{print}("Rho ")  # g.
else:
    \text{print}("Tau")  # h.
    if abs(\zeta) \leq 0.000001:
        \text{print}("Sigma")  # i.
if no > ok:
    \text{print}("Omega")  # j.
```
5. Repetition Statements and Lists (20 points)

a. Study the following code:

```python
for i in range(5):
    for j in range(i):
        print("*", end="")
    print("\n")
```

Draw the output of the program:

```
* *
* * *
* * * *
* * * * *
* * * * *
```

b. Write a line of Python code that creates a list or tuple named “nums” containing 5 integer elements.

```python
nums = [1, 2, 3, 4, 5]
```

c. Write a loop to print the values of all the elements in “nums”

```python
for num in nums:
    print(num)
```
6. Program Writing (20 Points)

Finish the code that will create two lists or tuples to hold the authors and titles of the books, execute a loop that will prompt the user for the book author (and store it in the authors list/tuple) and title (and store it in the titles list/tuple), and run a second loop to print each book’s information.

Sample output (will be different each time depending on user input):

How many books? 3

Book #1
Author? Stephen King
Title? The Stand

Book #2
Author? R. L. Stine
Title? Goosebumps

Book #3
Author? JRR Tolkien
Title? The Hobbit

Your books (3 total):
The Stand, by Stephen King
Goosebumps, by R. L. Stine
The Hobbit, by JRR Tolkien

Fill in the rest of the necessary code:

num_books = int (input ("How many books?"))
Answers:

1. Short Answer

a. 17 __int__________  
   19.8 __float__________  
   “Hello world” __str__________

b. EXAMPLES: str(47) __int(19.5) __float(“98.45”)  

c. Because – in certain structures like conditional statements and loops – the indentation is necessary in order to indicate which statements belong to a particular block of code.

d. In a CLI, the user interacts with the computer by typing commands at a prompt, whereas in a GUI, the user has access to a visual interface of textual and graphical elements that the user can manipulate via the keyboard and mouse.

2. Python Identifiers

<table>
<thead>
<tr>
<th>Identifier</th>
<th>Result</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>foobar</td>
<td>YES</td>
<td>Variable name</td>
</tr>
<tr>
<td>123abc</td>
<td>NO</td>
<td>Begins with a number</td>
</tr>
<tr>
<td>ca$h</td>
<td>NO</td>
<td>Contains an illegal character: $</td>
</tr>
<tr>
<td>False</td>
<td>YES</td>
<td>Python reserved word</td>
</tr>
<tr>
<td>STATES</td>
<td>YES</td>
<td>A constant</td>
</tr>
</tbody>
</table>

3. Expression Evaluation

<table>
<thead>
<tr>
<th>Value</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>YES</td>
</tr>
<tr>
<td>0</td>
<td>NO</td>
</tr>
<tr>
<td>1.75</td>
<td>YES</td>
</tr>
<tr>
<td>False</td>
<td>YES</td>
</tr>
<tr>
<td>e) True</td>
<td>YES</td>
</tr>
<tr>
<td>f) 25heythere</td>
<td>YES</td>
</tr>
<tr>
<td>g) -49True</td>
<td>YES</td>
</tr>
<tr>
<td>i) there21</td>
<td>YES</td>
</tr>
<tr>
<td>j) heyTrue</td>
<td>YES</td>
</tr>
<tr>
<td>k) thereTrue</td>
<td>YES</td>
</tr>
<tr>
<td>l) heyFalse</td>
<td>NO</td>
</tr>
</tbody>
</table>

4. Booleans and Branching

<table>
<thead>
<tr>
<th>Value</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) YES</td>
<td>YES</td>
</tr>
<tr>
<td>b) NO</td>
<td>NO</td>
</tr>
<tr>
<td>c) NO</td>
<td>NO</td>
</tr>
<tr>
<td>d) YES</td>
<td>YES</td>
</tr>
<tr>
<td>e) YES</td>
<td>NO</td>
</tr>
<tr>
<td>f) NO</td>
<td>NO</td>
</tr>
<tr>
<td>g) NO</td>
<td>NO</td>
</tr>
<tr>
<td>h) YES</td>
<td>YES</td>
</tr>
<tr>
<td>i) YES</td>
<td>YES</td>
</tr>
<tr>
<td>j) NO</td>
<td>NO</td>
</tr>
</tbody>
</table>
5. Repetition Statements and Lists

Output:

*  
**  
***  
****

Creating a tuple:  nums = (1, 2, 3, 4, 5)
Creating a list:  nums = [1, 2, 3, 4, 5]

Loop:

for num in nums:
    print(num)

6. Writing Programs

num_books = int(input("How many books? "))

authors = ()
titles = ()

for i in range(num_books):
    print("Book #" + str(i + 1))
    authors += (input("Author: "),)
    titles += (input("Title: "),)

print("Your books (" + str(num_books) + "total):")
for i in range(num_books):
    print(titles[i] + ", by", authors[i])