There are 25 single choice questions. Each one is worth 4 points. The total score for the exam is 100.

Answer the questions on the bubble sheet given.

Fill in the Instructor, Course, Signature, Test, and Date blanks in the bubble sheet. For “Instructor” put your RECITATION INSTRUCTOR’S LAST NAME given in the table below. For “Course” put CS 177. For “Test/Quiz” put 02.

Fill in the bubbles that correspond to your name, section and Student ID in the bubble sheet. For your section number, use the SECTION NUMBER of your recitation section. Consult the following list:

<table>
<thead>
<tr>
<th>Sec</th>
<th>Rec Time</th>
<th>Rec Room</th>
<th>Rec Instructor</th>
</tr>
</thead>
<tbody>
<tr>
<td>0001</td>
<td>WED 08:30</td>
<td>BRNG 1242</td>
<td>Kazi Mohammad</td>
</tr>
<tr>
<td>0002</td>
<td>WED 09:30</td>
<td>LWSN 1106</td>
<td>Ruby Tahboub</td>
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<td>0003</td>
<td>WED 10:30</td>
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<td>0004</td>
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<td>0005</td>
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<td>Uzun baz Serkan</td>
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<td>0006</td>
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<td>0007</td>
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<td>Kazi Mohammad</td>
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<td>0008</td>
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<td>0009</td>
<td>FR 13:30</td>
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<td>0010</td>
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<td>0011</td>
<td>FR 16:30</td>
<td>HAAS G066</td>
<td>Uzun baz Serkan</td>
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</tbody>
</table>

For your student ID, use the 10 digit ID number on your student ID card. DO NOT USE YOUR SOCIAL SECURITY NUMBER!

Exams without names will be graded as zero. Only the answers on the bubble sheet will be counted. The questions will be discarded.

Remember to fill in also the fields on page 2.
Q1. The binary representation for 11 is 01011. How would you express -11 in binary using two’s complement notation?

A) 10101  
B) 11011  
C) 10100  
D) 11100

Q2. If a sound file has 194040 samples and a sampling rate of 22050.0, what is the approximate duration of the sound?

A) 6 seconds  
B) 7 seconds  
C) 8 seconds  
D) 9 seconds

Q3. Which of the following can cause clipping in a given sound?

A) Decreasing the volume  
B) Increasing the volume  
C) Normalizing the sound  
D) None of the above.

Q4. When increasing the amplitude of a sound, which of the following are true?

(i) Positive values of the sound samples get larger  
(ii) Negative values of the sound samples get smaller  
(iii) Negative values of the sound samples get larger  
(iv) Positive values of the sound samples get smaller

A) (iii) and (iv)  
B) (i) and (iii)  
C) (i) and (ii)  
D) None of the above
Q5. Consider the following function,

```python
def changeVolume(sound, factor):
    for sample in getSamples(sound):
        value = getSampleValue(sample)
        setSampleValue(sample, value/factor)
```

Which of the following statements will cause the maximum increase in volume?

A) `changeVolume(sound, 2)`

B) `changeVolume(sound, 1.5)`

C) `changeVolume(sound, 0.75)`

D) `changeVolume(sound, 0.2)`

Q6. What is the purpose of the following function?

```python
def myfunction(source):
    target = makeEmptySound(getLength(source) * 2)
    sourceIndex = 0
    for targetIndex in range(0, getLength(target)):
        value = getSampleValueAt(source, int(sourceIndex))
        setSampleValueAt(target, targetIndex, value)
        sourceIndex = sourceIndex + 0.5
    play(target)
    return target
```

A) Halves the frequency of the source sound object.

B) Doubles the frequency of the source sound object.

C) Doubles the volume of the source sound object.

D) Halves the volume of the source sound object.
Q7. How many times does the following code print “CS177”?

```python
i = 0
j = 1
while i < 5:
    while 0 < j < 5:
        j = j + 2
        print "CS177"
    i = i + 2
print "CS177"
```

A) 5 times  
B) 4 times  
C) 3 times  
D) 2 times

Q8. Which of the following statements is WRONG?

A) MP3 files are encoded according to the MPEG-3 standard.  
B) MP3 files are audio files without compression.  
C) MP3 files can be compressed with lossy compression.  
D) MP3 files can be compressed with lossless compression.
Q9. Suppose we have two sound objects, `sound1` and `sound2` respectively, having each 2000 sample objects. Consider the following function:

```python
def myFunction(sound1, sound2):
    for sampleNmr in range(0, getLength(sound1)):
        sample1 = getSampleValueAt(sound1, sampleNmr)
        sample2 = getSampleValueAt(sound2, sampleNmr)

        if sampleNmr < 1000:
            setSampleValueAt(sound2, sampleNmr, 0)
        if sampleNmr > 1000:
            setSampleValueAt(sound2, sampleNmr, sample1 + sample2)

    play(sound2)
```

What does the function above do?

A) It adds `sound1` into `sound2` after 1000 samples.
B) It adds `sound2` into `sound1` after 1000 samples.
C) It makes the first 1000 samples of `sound1` silent.
D) It makes all the samples of `sound2` silent.

Q10. Which of the following explains the function below correctly?

```python
def modify(sound):
    for i in range(0, getLength(sound), 2):
        foo = getSampleValueAt(sound, i)
        bar = getSampleValueAt(sound, i+1)
        setSampleValueAt(sound, i, bar)
        setSampleValueAt(sound, i+1, foo)
    return sound
```

A) It shifts the values of the samples in the sound to the right by one position
B) It shifts the values of the samples in the sound to the left by one position
C) It swaps the values of the even-indexed samples with the samples on their left
D) It swaps the values of the even-indexed samples with the samples on their right
Q11. If we call the function in Q10 twice on a given sound, like:

```python
newSound = modify(sound)
newerSound = modify(newSound)
play(newerSound)
```

Which of the following is true about the played newerSound?

A) The samples of newerSound are shifted right by 2 positions with respect to the samples of the original sound  
B) The samples of newerSound are shifted left by 2 positions with respect to the samples of the original sound  
C) It is same as the original sound  
D) None of the above

Q12. Which of the following describes the “Top-Down Design” best?

A) Start building pieces you know, test them, combine them, and keep going until you have your program.  
B) Start from requirements, then identify the pieces to write, then write the pieces.  
C) Figure out the pieces that do not work, and the reason why they do not work and fix them.  
D) Add new features to your program, fix the newly discovered bugs, release updates for your program

Q13. Assume that you are supposed to write a chess program. Which of the following functions may be the topmost level function?

A) playGame()  
B) movePawn()  
C) announceWinner()  
D) showPossibleMoves()
Q14. To double the frequency of a sound:

A) We need to halve the number of samples of the sound
B) We need to double the number of samples of the sound
C) We need to halve the amplitude of all samples of the sound
D) We need to double the amplitude of all samples of the sound

Q15. What does the following function do?

```python
def myfunc(source):
    len = getLength(source) / 2 + 1
    target = makeEmptySound(len)
    targetIndex = 0
    for sourceIndex in range(0, getLength(source), 2):
        value = getSampleValueAt( source, sourceIndex)
        setSampleValueAt( target, targetIndex, value)
        targetIndex = targetIndex + 1
    play(target)
    return target
```

A) It returns a new sound with the volume of the source sound doubled
B) It returns a new sound with the volume of the source sound halved
C) It returns a new sound with the frequency of the original sound doubled
D) It returns a new sound with the frequency of the original sound halved

Q16. Which of the following statement about a Decibel (db) is WRONG?

A) A db is a logarithmic measure
B) A db measures the change in intensity of a sound wave
C) A db measures the volume of a sound wave
D) A db measures the frequency of a sound wave
Q17. Consider the following function:

```python
def myfunc():
    count1=0
    for x in range(0, 10):
        count1 = count1 + x
    return
```

If you write in the JES command window the following statements:
```python
>>> aa = myfunc()
>>> print aa
```

Which will be the result of the `print` statement above?

A) 0  
B) 45  
C) 50  
D) None

Q18. Which of the following statements about the JES `getMediaPath` is FALSE?

A) `getMediaPath` takes a `filename` as input parameter, and returns the complete path to the file specified  
B) The `filename` parameter is optional  
C) The `filename` parameter is mandatory  
D) `getMediaPath` takes a `filename` as input parameter, and returns the complete path to the file specified, as long as you've already used `setMediaPath()` to pick out the place where you keep your file

Q19. Consider the following list:
```python
myList = [ ['X', 'Y', 'Z'], ['A', 'B'], ['L', 'M', 'N']] 
```

What is the output of the following statement:
```python
>>> print myList[1][1]
```

A) X  
B) B  
C) A  
D) Y
Q20. Consider the following string

\[
\text{str = "I \nhave \nCS177 test \nright now"}
\]

How many lines are produced by the following statement?

\[
>>> \text{print str}
\]

A) 1  
B) 2  
C) 3  
D) 4

Q21. Suppose you have the following string:

\[
\text{str = "Purdue University"}
\]

Which of the following statements will produce the same result of \text{str.find("e")}?

A) \text{str.find("e",6)}  
B) \text{str.find("e",0,len(str))}  
C) \text{str.rfind("e")}  
D) \text{str.find("x")}

Q22. Consider the following list:

\[
\text{myList = ["A", "B", "C", "D", "A"]}
\]

what is the output of the following statements?

\[
>>> \text{myList.remove("A")}
>>> \text{print myList}
\]

A) \["B", "C", "D"]  
B) \["A","B", "C", "D", "A"]  
C) \["B", "C", "D", "A"]  
D) []
Q23. Suppose that the file `myFile.txt` contains the following:

CS177 Exam
Purdue University

And you have the following function `read()`

```python
def read():
    file = open("myfile.txt", "rt")
    content = file.read()
    print content
```

What is the output of the call to the function `read()`?

A) ['CS177 Exam\n', 'Purdue University']
B) CS177 Exam
   Purdue University
C) CS177 Exam Purdue University
D) myfile.txt CS177 Exam Purdue University

Q24. What are ALL the possible values of the following statement?

```python
>>> import random
>>> print int((random.random())*5)
```

A) 0, 1, 2, 3, 4
B) 1, 2, 3, 4, 5
C) 0, 1, 2
D) 1, 2, 3
Q25. Consider the following function:

```python
def myFunction(str):
    val = str.startswith("Res")
    if val == 1 :
        print "Yes"
    else :
        print "No"
```

Which of the following function call will print "Yes"?

A) myFunction("research")
B) myFunction("RESEARCH")
C) myFunction("Research")
D) myFunction("Reference")