★ANSWER KEY – CONFIDENTIAL★

UIL COMPUTER SCIENCE – 2018 REGION

Questions (+6 points for each correct answer, -2 points for each incorrect answer)

1) A	11) C	21) C	31) A
2) B	12) E	22) A	32) B
3) E	13) A	23) B	33) D
4) E	14) D	24) E	34) E
5) B	15) C	25) B	35) D
6) E	16) B	26) C	36) C
7) C	17) A	27) D	37) A
8) D	18) E	28) A	38) E
9) A	19) B	29) E	*39) A+B*C-D
10) B	20) D	30) C	*40) !(A^B) also $\overline{A \oplus B}$

** See "Explanation" section below for alternate, acceptable answers.*

Note: Correct responses are based on **Java SE Development Kit 8 (JDK 8)** from Sun Microsystems, Inc. All provided code segments are intended to be syntactically correct, unless otherwise stated (e.g., "error" is an answer choice) and any necessary Java SE 8 Standard Packages have been imported. Ignore any typographical errors and assume any undefined variables are defined as used.

Explanations:

1.	A	$AF_{16}=175_{10}$ $77_8=63_{10}$ 175+63=238_{10} Answer choices B, C, D, and E are all equal to 238_{10} $22201_3 = 235_{10}$ (1X1)+(2X9)+(2X27)+(2X81)=235
2.	B	-8%3+15%-4 = -2+3 = 1
3.	E	The escape sequences \" surround the result in quotes. The flag , (comma) makes the number have a comma separator. The flag ((parenthesis) encloses the number in parenthesis if it is negative. 7.2 rounds the number to two decimal places and places it into 7 spaces. When not enough space is allocated, printf will take the space that is needed.
4.	E	The substring method returns m. The two argument indexOf method will return the index of the first argument when it is found after the index number provided by the second argument. In this case, m does not appear in the string after index 20.
5.	B	F||F&&F^F= F||F&&F= F||F= F
6.	E	Math.round(x) returns long. long is promoted to float and double when needed.
7.	C	ASCII value of 'c' is 99. 99+12.75=111.75. Casting to char truncates to 111. ASCII number 111 = 'o'.
8.	D	n n%10 s 1593535253 3 1 159353525 5 6 15935352 2 11 1593535 5 16 159353 3 17 15935 5 22 1593 3 23 159 9 28 15 5 33 1 1 38
9.	A	k is incremented before the comparison to 5 is made, therefore, 0 is not printed.
10.	B	After the line b=a; both a and b point to the same array, array a. From this point any action taken on either array is taken on array a.
11.	C	next() returns a string.
12.	E	A produces an out of bounds error. B finds the sum of the evens. C produces an out of bounds error. D finds the sum of all the numbers except for 1.
13.	A	5|2*3=5|6. 101 OR 110 = 111 $111_2 = 7$
14.	D	32767-(-128)=32895
15.	C	5 5 3 5 3 8 5 6 3 8 5 6 4 8 5 6 4
16.	B	When the base case is reached the call stack is: l il uil gouil Pop each off the stack to get: liluilgouil
17.	A	For each row, if the current value in the row is less than the previous one, replace the current one with the previous one +1.

18.	E	Auto boxing automatically converts a primitive data type value to an object.
19.	B	Classes implement interfaces.
20.	D	When a class implements an interface, that class must implement all of the methods defined in the interface.
21.	C	An abstract method has a signature but is not implemented.
22.	A	i is a Cls object, c is a Cls object that has inherited from Intf.
23.	B	$7 = 00111_2$ Shift the bits to the left two spaces. That leaves 11100_2.
24.	E	The partition being sorted is bounded by the index values stored in left and right.
25.	B	This value will be swapped with the value found by the next line which will be smaller than the pivot.
26.	C	Divide this partition in two and recursively call the sort method on each of the new partitions. Since x and y have crossed paths in the code, ending the while loop, y is now the upperbound of the left partition and x is the lowerbound of the right partition.
27.	D	Best O(n log n), Average O(n log n), Worst $O(n^2)$
28.	A	Math.random returns 0.0 (inclusive) to 1.0 (exclusive). 0.0*10+20=0+20=20 0.99*10+20=9.9+20=29.9 which casts to 29
29.	E	Object is the cosmic super class. The elements in each collection are Strings. While it is greatly preferred that they are, collections do not strictly have to be parameterized.
30.	C	removeAll method removes everything in list from p.
31.	A	list is unaffected byt the call to removeAll.
32.	B	The left hand operand of the || operator evaluates to true. Because of short circuit evaluation the right hand side is never evaluated. Therefore c is not decremented.
33.	D	s1.substring(1,4) is “upp”. s2.substring(1,4) is “upe”. Ternary operator works like this: condition?true case:false case. “upp” is not equal to “upe” so false case is s2.
34.	E	This version of sort sorts the array beginning at the first argument and ending at one less than the second argument.
35.	D	[aeoiu] will match any of the vowels in the set. The loop breaks when a vowel is found. x stores the index number of that vowel. x+1 is the actual position of the vowel within the word when starting the count at one.
36.	C	A*(A+B)=A - Law of Absorption A+A*B=A - Law of Absorption A+1=1 – Law of Union A*1=A – Identity Law for AND A+0=A – Identity Law for OR
37.	A	The weight of an edge is the cost to travel along that edge from one vertex to another. The cost can be measured in money, time, distance or any other appropriate unit.
38.	E	Find the complement: 01111001. Add one to get 01111010. Convert to a decimal to get 122. Has to be negative because the sign bit was 1 in the original value. So, 10000110_2 = -122.
39.		A+B*C-D or B*C+A-D or A-D+B*C
40.		This is the logic gate for XNOR. Also accept $\overline{A \oplus B}$. Do not accept XNOR as an answer.