Computer Science Contest #1718-11 Key

February 03, 2018

1) D

2) A

3) D

4) E

5) A

6) B

7) B

8) E

9) D

10) C

11) D

12) A

13) E

14) D

15) E

16) C

17) C

18) A

19) E

20) B

21) D

22) C

23) B

24) C

25) A

26) E

27) B

28) D

29) E

30) D

31) C

32) D

33) A

34) C

35) B

36) D

37) A

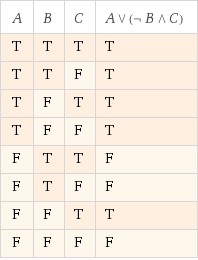
38) A or C

39) -+S/\*CAN/\*LGR

40)

**Note to Graders:**

* All provided code segments are intended to be syntactically correct, unless otherwise stated (e.g. error is an answer). **Ignore any typographical errors**.
* Any necessary Standard Java 2 Packages are assumed to have been imported as needed.
* Assume any undefined (undeclared) variables have been defined as used.

1. 7B16 – 1538 = 12310 – 10710 = 1610 = 1016
2. 23%5+36\*2 = 3+72 =75
3. %1$02d 7 -> pad with zeroes with a width of 2. %2$.4f 4.5 -> decimal number with 4 numbers after the decimal
4. "hello".substring(2) = "llo", "world".substring(1,4) = "orl"
5. || happens before &&
6. Math.max(-5.65, -8.52) = -5.65, Math.ceil(-5.65) = -5.0
7. 78.5%9 = 6.5
8. Without curly braces only the first line is part of the if
9. 205/2 = 102, 51 < 65
10. Every other letter starting at 'c', the for each loop converts the char to an int
11. Every other String starting at "H" is printed. res stores every other String starting at the first String – "A" – and prints at the end.
12. Tracing the loop – 7+(int).89=7, 7+(int)1.78=8, 8+(int)3.56=11, 11+(int)7.12=18
13. 6^13\*4+8 = 6^((13\*4)+8)= 6^(52+8) = 6^60 = 0001102^1111002 = 1110102 = 58
14. ~15 = ~000011112 = 111100002 = -16 in two’s complement (~ is bitwise not)
15. aL = [1,3,9,27,81], size = 5
16. 9|19^7<<2 = 9|(19^(7<<2)) = 10012 | (100112^(1112 << 2)) = 10012 | (100112^111002) = 10012 | 011112 = 11112 = 15
17. 
18. i=2 mat[2][3]=2, i=5 mat[1][2]=5, i=8 mat[0][1]=8, i=11 mat[3][0]=11, i=14 mat[2][3]=14, i=17 – loop ends
19. 111011102, flip bits - 000100012, add one - 000100102 = 8, 111011102 = -18
20. s.length()=9, size=18: i=0 index=6, i=3 index=0, i=6 index=3, i=9 index=6, i=12 index=0, i=15 index=3, i=18 loop ends
21. s.length()=8, size=16: i=0 index=6, i=3 index=1, i=6 index=4, i=9 index=7, i=12 index=2, i=15 index=5, i=18 loop ends
22. The instance variables are not initialized
23. name and number need to be changed to this.name and this.number
24. 'b' = 98, %% prints as % in printf
25. while(25>0) – r=25 p=0, r=12 p=7, r=6 p=14, while(25>14) – r=11 p=14, r=5 p=21, while(25>21) – r=4 p=21, r=2 p=28
26. 2+6+6+4=18
27. Math.pow() returns a double
28. 26=64.0, 64.0/5 = 12.8
29. Base case comes after the recursive call
30. 'L' = 76
31. HashSet will not contain duplicates and does not store things in a specific order
32. There can be no duplicate keys and it is sorted by key
33. Add 15, add 28, add 34, remove 15, add 27, remove 28 and 34, add 28+34, add 51, add 2, remove 27, remove 62 and 51, add 62+51
34. 9=10012, 10012<<3 = 10010002, 38=1001102, 10010002^01001102 =11011102 = 110
35. ^REO splits the string on every character but R, E, and O
36. 98 = 11000102, Flip the bits – 100111012, add 1 🡪 100111102
37. Inorder transversal is left node, root node then right node
38. D repeats
39. S+C\*A/N-L\*G/R 🡪 ((S+((C\*A)/N))-((L\*G)/R)) 🡪 (-(+S(/(\*CA)N))(/(\*LG)R))🡪 -+S/\*CAN/\*LGR
40. NOT A and B connected to an OR gate, C and D are connected to a NAND, the results of OR and NAND are connected to an XOR