SSSS Density Lab Key

Team Name/Number: Density Lab

Raw Score: 40/40

Rank: 1

Section A

1. Matching [4 pts, 0.5 pts per correct match]
    a. IV
    b. VII
    c. I
    d. II
    e. VI
    f. VIII
    g. I
    h. V
2. 3.34 * 10^{28} molecules / m^3
3. 0.100 atoms / cm^3
4. 80.0 kg/m^2
5. 53.5 cm
6. 1.1 g
7. 3.0%
8. 66%
9. Circle Answer: A **(B)** C D
10. 400 ppm
11. 12.0 ppb
12. Sugar
13. 1/10
14. 2.58 M
15. 2 (it doubles)
16. 0.219 M
17. 0.5 M
18. 1.02 m
19. 1 kg
20. 82.00 kg
21. ½
22. 985 kg/m^3
23. 1060 kg/m^3
24. 8.76 g/cm^3
25. More
26. It will double
27. Float
28. 1/5 or 0.2
29. 1440 kg/m^3
30. Greater
31. Increase
32. Increase
33. Right

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34. (i) Increase

    (ii) Decrease (note: ice is less dense than liquid water)

    (iii) No, decreasing temperature usually *decreases an object's volume (i.e. it condenses an object) (1 point)*, which in turn *raises its density (1 point)*. [2 pts total]

    (iv) Slope

35. 1) The gas consists of a large number of molecules in random motion and obeying Newton's Laws of Motion

    2) The volume of the molecules is small compared to the volume of the gas

    3) No forces act on the molecules except during elastic collisions [3 pts total]

36. Charles's Law

37. Quadruples

38. (i) 38 mol/L

    (ii) 650 g/L

    (iii) Float

39. (i) 10 N

    (ii) 10 N

    (iii) Principle of Flotation

    (iv) Density

    (v) Accept variations on the example (main parts of the answers are italicized): *They are empty on the inside*, decreasing the mass of the boat (1 point), which in turn *decreases the boat's density* (1 point). With their decreased average density, *boats can therefore displace their weight*, following the principle of flotation (1 point). [3 pts total]

40. Matching [4 pts, 0.5 pts per correct match]

    a. V

    b. VI

    c. VIII

    d. VII

    e. IV

    f. II

    g. I

    h. III