Jordan University of Science and Technology
Faculty of Sciences and Arts
Department of Applied Chemical Sciences
Chem. 103 Second Exam
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Instructor :

n : 1 Serial Number : 75

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Q	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
A	D	A	C	B	D	C	A	C	B	A	D	B	D	A	B	D	C	D	B	C

1) Given the elements H,N,O and C with electronegativities of 2.1 , 3.0 , 3.5 , and 2.5 respectively. Which bond is the most polar one.
A) H-C B) C-O C) H-N D) H-O

2) Electronegativity... from left to right within a period and .... from top to bottom within a group.
A) increases, decreases B) increases, increases
C) decreases, increases D) decreases, decrease

3) A sample of gas (24.2 g) initially at 4.00 atm was compressed from 8.00 L to 5.00 L at constant temperature. After the compression, the gas pressure is .... atm.
A) 10.7 B) 5.33 C) 6.40 D) 16.0

4) A balloon originally has a volume of 4.39 L at 65°C and a pressure of 729 torr. The balloon must be cooled to ....°C to reduce its volume to 3.78 L (at constant pressure).
A) 30 B) 18 C) 0 D) 11

5) A sample of a gas (1.50 mol) in a 15.0 L cylinder. The temperature is increased from 100 °C to 125 °C. The ratio of the final pressure to the initial pressure [P_2 / P_1] is ....
A) 1.27 B) 1.20 C) 1.13 D) 1.07

6) The reaction of 30 mL of N_2 gas with 90 mL of H_2 gas to form ammonia according to:
$N_2(g) + 3H_2(g) \rightarrow 2NH_3(g)$ produces... mL of ammonia if pressure and temperature are kept constant.
A) 80 B) 100 C) 60 D) 40

7) What is the total pressure (atm) in a 17.5L container that contains 6.0g of $H_2(g)$ [MM=2g/mole] and 16.0g of $O_2(g)$ [MM=32g/mole] at 0°C ? R=0.082 L atm / mol K
A) 4.48 B) 3.92 C) 3.48 D) 5.22

8) A container contains N_2, Ar, He, and Ne. The total pressure in the container was 789 torr. The partial pressures of nitrogen, argon, and helium were 144, 286, and 118 torr, respectively. The mole fraction of N_2 in the container is:
A) 0.305 B) 0.362 C) 0.183 D) 0.150

9) If a gas effuses by a factor of 0.638 times slower than CO_2 gas (MM = 44 g/mol) then the molar mass of this gas is:
A) 223 B) 108 C) 207 D) 146

10) The concentration (M) of nitrate ion (NO_3^-) in a 1.0 L solution that contains 6.6 g of aluminum nitrate $Al(NO_3)_3$ [MM = 213 g/mol] is:

A) 0.093 B) 0.080 C) 0.135 D)0.106

11) The concentration of a benzene solution prepared by dissolving 18.0 g C_6H_6 [MM = 78g/mol] in 38.0g CCl_4 is ....molal.

A) 4.05 B) 6.75 C) 5.40 D) 6.07

12) A solution is prepared by dissolving 13.0 g of NH_3 [MM = 17g/mol] in 250.0g of water [MM = 18g/mol]. The mole fraction of NH_3 in the solution is:

A) 0.0745 B) 0.0522 C) 0.0817 D) 0.0597

13) Which of the following would have the lowest freezing point?

A) 0.5m CH_3OH B) 0.6m CH_3CH_2OH C) 0.2m NaCl D) 0.25m K_2SO_4

14) The vapor pressure of pure water at 55 °C is 118 torr. What is the vapor pressure (torr) of water above a solution prepared by dissolving 85 g of ethyleneglycole (a nonelectrolyte, MW = 62 g/mol) in 200g of water? [MM of water = 18g/mol]

A) 105 B) 100 C) 110 D) 115

15) The freezing point of ethanol (C_2H_5OH) is -114.6 °C. The molal freezing point depression Constant (K_f) for ethanol is 2.00 °C/m. What is the freezing point (°C) of a solution prepared by dissolving 45.0 g of glycerin $(C_3H_8O_3$, a nonelectrolyte) [MM = 92g/mol] in 200.0 g of ethanol?

A) -118.4 B) -119.5 C) -117.3 D) -120.5

16) Choose the most correct statement of the followings:

A) The molal freezing point depression constant (Kf) depends on the type of solute.
B) Vapor pressure decreases as the amount of solute decreases.
C) Boiling point elevation (ΔT_b) increases by decreasing the amount of solute.
D) Boiling point (T_b) increase by increasing the amount of solute in solution.

17) What is the osmotic pressure of a nonelectrolyte solution having a concentration of 0.014M at 25 °C? (R=0.082 L atm /mol K)

A) 520 torr B) 186 torr C) 260 torr D) 390 torr

18) Consider a solution of 0.567 M NaCl solution with a density of 1.084 g/mL. What is the molality of this solution is: (Molar mass of NaCl is 58.5 g/mol)

A) 0.540 B) 0.500 C) 0.559 D) 0.520

19) The number of moles of a gas that occupies 57.8L at 27°C and 1.25 atm is (R=0.082)

A) 3.41 B) 2.94 C) 3.18 D) 2.67

20) Choose the most correct statement:

A) Ideal gas equation can be applied to determine the number of moles of solvent.
B) STP conditions for all gases are 1atm and 30°C.
C) O_2 gas can be collected over water.
D) Molar volume of any ideal gas at STP equals 12.4 L.

GOOD LUCK :)