INDIAN SCHOOL AL WADI AL KABIR

UNIT TEST 2020-2021

Date: 16/06/2020   Max. Marks: 30

Class: XI   Subject: **CHEMISTRY**   Time: 1 hour

General instructions:

* There are 30 questions.

* Each question carries one mark.

* All questions are compulsory.

* Choose only one answer from the options given.

Questions 1 to 20 are multiple choice questions:

1.	Name the strongest intermolecular force present between ammonia molecules. a) London Forces b) Dipole - Dipole Forces c) Dipole–Induced Dipole Forces d) Hydrogen bond
2.	What is the value of compressibility factor, Z for an ideal gas? a) 0 b) 1 c) 10 d) Infinity
3.	What is the boiling point of water when the external pressure is 1 bar? a) 100 ^{0}C b) 99.4 ^{0}C c) 99.6 ^{0}C d) 100.4 ^{0}C

4.	Identify the correct statement: a) ΔH is positive for exothermic reactions which evolve heat during the reaction and ΔH is negative for endothermic reactions which absorb heat from the surroundings. b) ΔH is negative for exothermic reactions which evolve heat during the reaction and ΔH is positive for endothermic reactions which absorb heat from the surroundings. c) ΔH is positive for exothermic reactions which absorb heat from the surroundings and ΔH is negative for endothermic reactions which evolve heat during the reaction. d) ΔH is negative for exothermic reactions which absorb heat from the surroundings and ΔH is positive for endothermic reactions which evolve heat during the reaction.
5.	State whether true or false: No work is done during free expansion of an ideal gas. a) True b) False
6.	Identify the type of system if reactants are present in a thermos flask. a) Open System b) Closed System c) Isolated System d) None of the above
7.	w_{ad} is ……. when work is done on the system and q is ……. when heat is transferred from the surroundings to the system. a) positive, positive b) positive, negative c) negative, positive d) negative, negative
8.	What is the relationship between heat capacity at constant volume (C_v) and heat capacity at constant pressure (C_p) for one mol of an ideal gas? a) $C_p = C_v + R$ b) $C_p = C_v - R$ c) $C_v = C_p + 2R$ d) $C_p = C_v - 2R$

9.	Critical temperatures of nitrogen and carbon dioxide are 126.0 K and 304.1 K respectively. Which of these gases will liquify first when you start cooling from 400 K to their critical temperature and why? a) Carbon dioxide will liquify first because it has stronger intermolecular force than nitrogen. b) Nitrogen will liquify first because it has stronger intermolecular force than carbon dioxide. c) Carbon dioxide will liquify first because it has weaker intermolecular force than nitrogen. d) Nitrogen will liquify first because it has weaker intermolecular force than carbon dioxide.
10.	Each line of the volume *vs* temperature graph at constant pressure is called ………. a) Isotherm b) Isobar c) Isochore d) None of these
11.	Which of the following is called Combined gas law? a) $\dfrac{V_1}{T_1} = \dfrac{V_2}{T_2}$ b) $pV = n\,RT$ c) $\dfrac{p_1 V_1}{T_1} = \dfrac{p_2 V_2}{T_2}$ d) $\left(p + \dfrac{an^2}{V^2} \right)(V - nb) = nRT$
12.	The temperature at which a real gas obeys ideal gas law over an appreciable range of pressure is called …………… a) Boyle temperature, b) Normal boiling point c) Critical temperature d) Standard boiling point

13.	Which of the following shows the correct order of decreasing boiling point? a) $HF > He > CO$ b) $CO > He > HF$ c) $He > HF > CO$ d) $HF > CO > He$
14.	What type of wall does a system have if no heat is absorbed by the system from the surroundings, but work is done on the system? a) thermally conducting wall b) imaginary wall c) adiabatic wall d) None of these
15.	Which of the following is an extensive property? a) temperature b) density c) pressure d) enthalpy
16.	The quantity of heat required to raise the temperature of one unit mass of a substance by one degree Celsius (or one kelvin) is called .... a) specific heat capacity b) molar heat capacity c) heat capacity d) enthalpy
17.	If the vapour of a compound is assumed to be a perfect gas, molar enthalpy change for vapourisation of 1 mol at 1bar and 127 °C is 60 kJ mol^{-1}. Calculate the internal energy change (in kJ mol^{-1}), when 1 mol of this compound is vapourised at 1 bar pressure and 127 °C (Given, R = 8.3 Jmol^{-1}K^{-1}) a) 566.8 b) 56.68 c) 589.0 d) 58.90
18.	Calculate the amount of heat necessary (in J) to increase the temperature of 60.0 g of calcium from 35°C to 45°C. Molar heat capacity of Ca is 20 J mol^{-1} K^{-1}. (Atomic mass of Ca = 40 u) a) 300 b) 12000 c) 8490 d) 33.96

19.	What will be the pressure (in bar) exerted by a mixture of 32 g of methane and 112 g of carbon monoxide contained in a 6 L flask at 27 ^{0}C? Given R = 0.083 bar L K^{-1} mol^{-1} (C=12, H=1, O=16) a) 2.24 b) 22.4 c) 24.9 d) 2.49
20.	At 27°C and 1 bar pressure a gas occupies 600 mL volume. What will be its pressure at a height where temperature is 17°C and volume of the gas is 870 mL a) 1.66 bar b) 1.5 bar c) 0.66 bar d) 0.43 bar

Assertion and Reasoning questions:

21.	Assertion: Liquids and solids are hard to compress. Reason: Magnitude of the repulsion rises very rapidly as the distance separating the molecules decreases. a) Both assertion and reason are correct statements, and reason is the correct explanation of the assertion. b) Both assertion and reason are correct statements, but reason is not the correct explanation of the assertion. c) Assertion is correct, but reason is wrong statement. d) Assertion is wrong, but reason is correct statement.
22.	Assertion: The magnitude of surface tension of a liquid depends on the attractive forces between the molecules. Reason: Strong intermolecular forces between molecules hold them together and resist movement of layers past one another. a) Both assertion and reason are correct statements, and reason is the correct explanation of the assertion. b) Both assertion and reason are correct statements, but reason is not the correct explanation of the assertion. c) Assertion is correct, but reason is wrong statement. d) Assertion is wrong, but reason is correct statement.

23.	Assertion: Adiabatic process is a process in which there is no transfer of heat between the system and surroundings.
	Reason: The wall separating the system and the surroundings in an adiabatic process is thermally conducting.
	a) Both assertion and reason are correct statements, and reason is the correct explanation of the assertion. b) Both assertion and reason are correct statements, but reason is not the correct explanation of the assertion. c) Assertion is correct, but reason is wrong statement. d) Assertion is wrong, but reason is correct statement.
24.	Assertion: The energy of an isolated system is constant.
	Reason: For an isolated system, w = 0 and q = 0.
	a) Both assertion and reason are correct statements, and reason is the correct explanation of the assertion. b) Both assertion and reason are correct statements, but reason is not the correct explanation of the assertion. c) Assertion is correct, but reason is wrong statement. d) Assertion is wrong, but reason is correct statement.
25.	Assertion: Molar heat capacity is an extensive property.
	Reason: The value of molar heat capacity does not depend on the quantity or size of matter present in the system.
	a) Both assertion and reason are correct statements, and reason is the correct explanation of the assertion. b) Both assertion and reason are correct statements, but reason is not the correct explanation of the assertion. c) Assertion is correct, but reason is wrong statement. d) Assertion is wrong, but reason is correct statement.

Read the given passage and answer the questions that follow:

Liquids tend to minimise their surface area. The molecules on the surface experience a net downward force and have more energy than the molecules in the bulk, which do not experience any net force. Therefore, liquids tend to have minimum number of molecules at their surface. If surface of the liquid is increased by pulling a molecule from the bulk, attractive forces will have to be overcome. This will require expenditure of energy.

26.	The energy required to increase the surface area of the liquid by one unit is called …………… a) surface energy b) surface tension c) critical energy d) thermal energy
27.	Moist soil grains are pulled together because surface area of thin film of water is ………. a) increased b) decreased c) doubled d) None of these
28.	In the gravity free environments liquid drops are perfectly ……… a) elastic b) spherical c) oval d) no specific shape
29.	SI unit of viscosity coefficient is …………... a) $N s m^{-1}$ b) $N m^{-1}$ c) $N s m^{-2}$ d) $N m^{-2}$
30.	Increase in temperature increases the kinetic energy of the molecules and effectiveness of intermolecular attraction………. Therefore, surface tension …………… as the temperature is raised. a) decreases, decreases b) increases, decreases c) decreases, increases d) increases, increases

ANSWER KEY

1.	d
2.	b
3.	c
4.	b
5.	a
6.	c
7.	a
8.	a
9.	a
10.	b
11.	c
12.	a
13.	d
14.	c
15.	d
16.	a
17.	b
18.	a
19.	c
20.	c
21.	a
22.	b
23.	c
24.	a
25.	d
26.	a
27.	b
28.	b
29.	c
30.	a