

IN THE NAME OF ALLAH,

CIRCLE OF PRELIM MUSIM SCIENCE STUDENTS

INSTRUCTION; ANSWER ALL THE QUESTIONS PREEXAM- PHY115 DURATION- 30MINS

- Glass window pane in an office has an area of 3.2m^2 and thickness 4mm. The average temperature outside the office is 31 degree Celsius. Calculate the minimum rate in watt at which conditioner has to pump out heat to keep the temperature in the office at 20 degree Celsius. Thermal conductivity for glass is 1.0 w/m.k. a. 2.20 b. 88000 c. 8800 d. 22000
- Boltzmann constant is the ratio of gas constant to ----- a. henry constant b. molar gas constant c. Avogadro's constant d. permisitivity of free space e. none
- What is the root mean square speed of an oxygen molecules at zero degree Celsius in meter/sec a. 400 b. 90 c. 200 d. 461.2 d 300 e. none
- If the temperature of the sun is estimated to be 5700k. Calculate the total power it radiates. Assume the sun is a spherical black body of radius 710000km a. $9.48 \times 10^{19}\text{b. } 9.38 \times 10^{19}\text{c. } 9.900 \times 10^{19}\text{d. } 1.48 \times 10^{19}\text{e. none}$
- What is the maximum efficiency of an engine which operates between two reservoirs at the temperature of 25c and 100c a. 20.5% b. 20.11% c. 20.6% d. 20.12% e. none
- 2,4,6- trinitrophenol becomes more liquefied at 76.9k. Express this temperature in the Fahrenheit scale? a. -321 b. -90 c. -200 d. 461.2 d 300 e. none
- A malaria patient has a body temperature of 39.5c. calculate the temperature in Fahrenheit a. -321 b. -90 c. -200 d. 461.2 d 300 e. none
- For a blackbody, emissivity constant is----- a. 2 b. 3 c. infinity d. unity e. 9
- Three moles of a gas expand isothermally if the initial temperature of the gas is 300.1k and its final volume is twice the initial volume calculate the work done by the gas in joule a. 5123.6 b. 4198.6 c. -200 d. 5186.5 e. 324.8 e. none 5185
- Which of the following is odd a. convection b. conduction c. radiation d. eutectic e. none
- A 50kg mass is placed on a piston that is frictionless if 149 joules of heat energy is supplied to the gas cylinder and the internal energy is increased by 100joules what is the height in metres to which the mass on the piston is raised? a. 0.1 b. 0.2 c. 0.4 d. 0.5 e. 0.3
- An experimental metallic vessel where the newly isolated drug in Indian was kept by MALIK measures 5cm x 5cm is heated from 4 degree Celsius to 79 degree Celsius. What is change in area in metre squared of the plate if the coefficient of linear expansivity of the vessel is 1.8×10^{-5} per Celsius degree a. $600 \times 10^{19}\text{b. } 9.556 \times 10^{19}\text{c. } 9.900 \times 10^{19}\text{d. } 6.75 \times 10^{-4}\text{e. none}$
- Which of the following is false a. $c_p + c_v = R$ b. temperature is directly proportional to AVERAGE kinetic energy c. internal energy is microscopic d. internal could be a macroscopic component of the system e. all no answer
- Which of the following is always true a. all metal is always solid b. thermal conductivity of metal is high c. temperature is not important in thermochemistry d. Carnot engine is not ideal e. two of the above
- of a body is the amount of heat that needed to raise the temperature of the body by 1 degree Celsius a. specific volume b. specific heat c. specific gravity d. vant hoff constant e. none
- 50g of ice is melted at the same temperature. Calculate the change in internal energy if the latent heat of fusion is $3.35 \times 10^5\text{ j/kg}$ a. $9.48 \times 10^{19}\text{b. } 9.18 \times 10^{19}\text{c. } 9.89 \times 10^{19}\text{d. } 1.68 \times 10^4\text{e. none}$
- The third body which is usually used experimentally that is in equilibrium with two separate bodies in thermodynamics is - a. thermometer b. interferometer c. milometers d. metals e. none
- The following assumptions are made in the kinetic theory except a. the molecules are so small that the volume of individual molecules could be neglected b. force of attraction and not repulsion between the molecules is negligible except during collisions c. the total kinetic energy of the molecules before collision is equal to the total kinetic energy after collisions d. two of the above e. none
- For ideal gas, the ratio PV/nRT is ----- a. 2 b. 3 c. infinity d. unity e. 9
- What is the full name of your tutor? Adebisi Yusuf Adebayo
- How many months make up the Islamic calendar? 12

KA
4000+323

273

$C = 273 +$

$273 + K = C$

$273 + 2C = K$

233.5

$C = F - 32$
 $F = 9 \times C + 32$

$273.5 = \frac{F - 32}{9}$

$5K - 32$

-210.15

1941.58

$32.5 = F - 32$
 $F = 9 \times 32.5 + 32$

$3 \text{ nRT} \ln \frac{V_f}{V_i}$

$3 \times 8.314 \times 300 \ln 2$

$nRT \ln$

$C_p = C_v + R$

$1.8 \times 10^{-5} \times 2 = \frac{\Delta A}{2.5 \times 10^{-3} + 75}$

mgh
 $50 \times 9.8 \times 4 = 1960$

NAME:.....
 Attempt all questions.

CONSTANTS

S.H.C.copper=386J/Kg.K
 Molar volume=22.4dm³
 S.H.C.bullet=128J/Kg.K

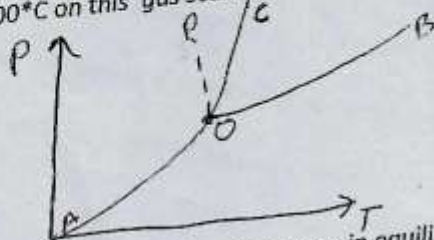
S.H.C.water=4180J/Kg.K
 Spring constant =500N/m
 g= 9.8m/s²

Latent heat(evaporation)water=22.56Kj/Kg
 Room temperature=25°C

1	A	B	C	D	8	A	B	C	D	15	A	B	C	D	22	A	B	C	D	29	A	B	C	D
2	A	B	C	D	9	A	B	C	D	16	A	B	C	D	23	A	B	C	D	30	A	B	C	D
3	A	B	C	D	10	A	B	C	D	17	A	B	C	D	24	A	B	C	D	31	A	B	C	D
4	A	B	C	D	11	A	B	C	D	18	A	B	C	D	25	A	B	C	D	32	A	B	C	D
5	A	B	C	D	12	A	B	C	D	19	A	B	C	D	26	A	B	C	D	33	A	B	C	D
6	A	B	C	D	13	A	B	C	D	20	A	B	C	D	27	A	B	C	D	34	A	B	C	D
7	A	B	C	D	14	A	B	C	D	21	A	B	C	D	28	A	B	C	D	35	A	B	C	D

- 1) Any change in thermodynamic variable will lead to (a) system (b) function (c) property (d) process
 2) The resistance R of a platinum varies the temperature T(*C) as measured by a constant-volume gas thermometer according to the equation $R(T)=R_0(1+8000\alpha T-\alpha T^2)$ where α is a constant. Calculate the temperature on the platinum corresponding to 400°C on this gas scale. {a} 385K {b} 885°C {c} 385K {d} 885K

3)

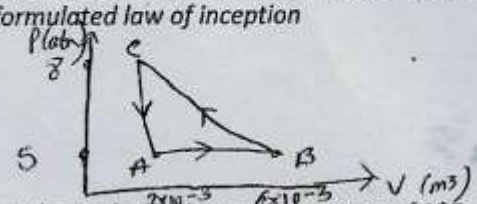


- The locus of point where ice coexist with vapour in equilibrium is (a) OA (b) OB (c) OC (d) OD
 4) All but one of the following is not an assumption made in the kinetic theory of gas..... {a} the collisions between molecules and wall of container are perfectly elastic {b} the collision is caused by the force of attraction between molecules {c} all the molecules are identical {d} the volume of the molecules is negligible.
 5) Which of the following is incorrect for water between 0°C and 4°C? (a) it expands indefinitely (b) density decreases (c) density increases (d) it is at triple point
 6) Who reported the most hadith of the prophet {S.A.W.}? (a) Abu-Bakr (b) Abu Hurairah (c) Umar (d) Ibn Abass
 7) At what temperature does the Fahrenheit scale equals the celcius scale..... {a} 32 {b} -40 {c} 40 {d} -32
 8) Consider a gas in which any ten molecules have the following speeds; 1,2,3,3,4,4,4,5,5,6. Determine the root mean square speed. (a) 3.7 (b) 4.7 (c) 3.75 (d) 4.75
 9) Calculate the root mean square speed of oxygen at 0°C (a) 14.58m/s (b) 20.62m/s (c) 14.58m/s (d) 20.62m/s
 10) What will be the height of a 0.7m by 0.8m box if it contains 2 moles of an ideal gas at S.T.P. (a) 0.08dm (b) 0.8m (c) 8cm (d) 80m
 11) A bullet moving with speed of 100m/s in a room hits a copper metal of same mass at 20°C and got embedded in it. What will be the temperature of the bullet after stopping? (a) 27°C (b) 31°C (c) 44°C (d) 33°C
 12) How many hours will it take a 60-Watt electric heater to boil 419g of ice? (a) 3078.9 (b) 51.3 (c) 0.86 (d) 0.014
 13) 3.175 moles of oxygen gas at a temperature of 34°C and pressure of 2.3bar and contained in a closed cylinder made from an insulator is placed on an electric cooker supplying heat at the rate of 213KJ/sec for 1.2 hours. Calculate the change in internal energy of the oxygen gas..... (a) no answer (b) 0KJ {c} -15336KJ {d} 15336KJ
 14) Which of the following is a pair of intensive property and path dependent quantity..... (a) temperature, internal energy (b) volume, work done (c) density, heat transfer (d) specific volume, mechanical energy.
 15) Which of the following process is involved in cooking? (a) isobaric (b) isothermal (c) isochoric (d) adiabatic
 16) Which is the odd one out of the following thermodynamic systems? (a) an isolated system (b) a system in thermal equilibrium with the surroundings (c) a closed system (d) an insulated pot

.....an hardworking mind will always excel, put your utmost effort and pray for ALLAH'S RAHMAN,
 Surely you will be blessed.

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Kandien

- 17) All but one of the following are thermometric properties except (a) colour (b) sound (c) volume (d) resistance
- 18) Which of the following is not among the wives of the prophets? (a) Hafsa (b) Safiyyah (c) Summayyah (d) Zaynab
- 19) Which of the following laws can be used in determining the actual time a murder was committed? (a) first law of thermodynamics (b) initial law of existence (c) Newton's law of cooling (d) formulated law of inception
- 20) 2 moles of an adiabatic gas expands from A to B. It is then compressed adiabatically to state C before returning to its initial state A as shown in the graph. Calculate the total work done and the change in internal energy of the for the process.
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- {a} 5573, 2027 {b} 3456, 2027 {c} 2027, 3456 {d} 5573, 0
- 21) What will be the change in internal energy and work done in KJ if BC were to be isothermal at a temperature of 1°C....
- {a} -2979, 0 {b} 2027, -2979 {c} 0, -2979 {d} -2979, 2027
- 22) A refrigerator working in reverse is called (a) heat generator (b) heat pump (c) heat generator (d) heat engine
- 23) A reversible heat pump has a temperature of 77°C at the reservoir and 22°C at the sink. What is the coefficient of performance of this heat pump? (a) 0.16 (b) 3.36 (c) 5.36 (d) 6.36
- 24) What will be the COP if it were to be a refrigerator? (a) 0.16 (b) 3.36 (c) 5.36 (d) 6.36
- 25) The ratio; $T_c/T_h = Q_c/Q_h$ holds for ... (a) reversible engines (b) irreversible engines (c) Carnot engines (d) heat engines
- 26) Which of the following is not true of a Carnot engine? (a) efficiency is 100% (b) it is reversible (c) $Q_h/T_h = Q_c/T_c$ (d) it undergoes four processes.
- 27) The prophet {SAW} said 'you are not yet a believer until you love for your brother what you love for yourself.' How many people did you call for this test? (a) 1 (b) 2 (c) 3 (d) >3
- 28) A Carnot engine operating between two reservoirs at 20°C and 500°C has an input of 150KW. Calculate the efficiency of the engine..... {a} 0.96 {b} 0.62 {c} 0.38 {d} 0.73
- 29) If the engine is used to raise a car of 250000kg, at what height will it have raised the car after operating for 10 minutes (a) 22.8m (b) 33.9m (c) 44.1m (d) 55.5m
- 30) If the sink contains 25kg of water, what will be the change in its temperature after that 10 minute (a) 272K (b) 53K (c) 326K (d) 53°C
- 31) Which of the following is a possible way of increasing the efficiency of the above heat engine? (a) removing the sink so that no heat is lost (b) increasing the temperature interval between the hot and cold reservoir (c) using a working fluid of higher conductivity (d) reducing the processes to two instead of four
- 32) What will be the temperature of the freezing chamber of a refrigerator whose COP is 4.67 and placed in a room if the electric energy supplied is 419J? (a) 20.6°C (b) -27.6°C (c) -20.6°C (d) 27.6°C
- 33) In which of the following is Q the highest?, Lowest? (a) isobaric, adiabatic (b) isothermal, adiabatic (c) isobaric, isochoric (d) adiabatic, isochoric
- 34) In which of the following is W the highest?, Lowest? (a) isobaric, adiabatic (b) isothermal, adiabatic (c) isobaric, isochoric (d) adiabatic, isochoric
- 35) In which of the following is ΔU the highest?, Lowest? (a) isobaric, adiabatic (b) isothermal, adiabatic (c) isobaric, isochoric (d) adiabatic, isochoric

.....remember dear brethren that;

Proper Preparation Plus Prayer Prevents Poor Performance

As you are preparing rigorously for this worldly examination, try to remember that examination {Judgement Day} which cannot be passed by any form of malpractice except for those that meet their Lord with pure heart.

Everybody writes exam but muslims are different 'cos they never cheat and always succeed

Go for it brethren..... Go succeed..... Go be the Vibrant Vicegerent

Wishing you all the best in your exams.

CPMSS.....academic excellence and spiritual uplift.