eExam Question Bank

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Question Type	Question	A	B	C	D	Answer	R
FBQ	At a temperature low enough, most metals as well as many alloys and compounds enter a state at which their resistant to flow of current disappears. This state is called [ ] in metals.	superconductivity	superconductivity				
FBQ	[ ] of gases is the process by which substances in their gaseous state are converted to the liquid state.	Liquefaction	Liquefaction				
FBQ	Cooling by adiabatic demagnetisation involves successive [ ] magnetizations followed by adiabatic demagnetisations	isothermal	isothermal				
FBQ	In the theory of adiabatic demagnetisation, we can $dU = TdS+$ [ ]	BdM	BdM				
FBQ	In gegneral, two processes are involved in cooling a gas namely; [ ] process followed by [ ] process	isothermal, adiabatic	isothermal, adiabatic				
FBQ	[ ] process is an irreversible steady flow expansion process in which a perfect gas is expanded through an orifice of minute dimensions such as a narrow throat of a slightly opened valve.	Throttling	Throttling				
FBQ	Sublimation, vaporization and fusion are [ ] order phase transition.	first	first				
FBQ	Phase transition for a pure substance occurs at [ ] temperature and pressure.	constant	constant				
FBQ	[ ] specifies the conditions of temperature and pressure beyond which it is no longer possible to distinguish a liquid from a gas.	critical point	critical point				

	FBQ	[ ] temperature is the temperature at which solid, liquid, and vapour phases coexist in equilibrium.	triple point	triple point				
	FBQ	[ ] is composed of free-floating ions and free electrons.	Plasma	Plasma				
	FBQ	Molecules are arranged in a closely packed form called crystal and can only vibrate about their lattice points in a [ ] phase.	solid	solid				
	FBQ	Internal energy U, enthalpy H, Helmholtz free energy A and Gibbs free energy G are examples of thermodynamic [ ]	potential	potential				
	FBQ	A [ ] is a device that uses work to transfer energy from a low temperature reservoir to a high temperature reservoir as it continuously repeats a set series of thermodynamic processes.	refrigerator	refrigerator				
	FBQ	A device normally placed between hot and cold portions of the machine that is in contact with the hot and cold reservoirs respectively is called a [ ]	regenerator	regenerator				
	FBQ	A [ ] is a device used to convert thermal energy (i.e. heat) into mechanical work and then exhausts the heat which cannot be used to do work.	heat engine	heat engine				
	FBQ	No process is possible whose sole result is the complete conversion of heat into work. This is the statement of the [ ] law of thermodynamics	second	second				
	FBQ	The ratio of the work output to the heat transfer per cycle is the measure of [ ] of an engine	efficiency	efficiency				
	FBQ	The most efficient, ideal heat engine is the [ ] engine	Carnot	Carnot				
	FBQ	The mathematical statement that the change in entropy is greater than or equal to zero is a statement of [ ] law of thermodynamics	second	second				
	FBQ	If a process occurs in a closed system, the entropy of the system increases for irreversible processes and remains constant for reversible processes. Entropy of a system never decreases. The is a statement of [ ] law of thermodynamics	second	second				

	FBQ	Complete the equation of the change in entropy of a cool reservoir $$\Delta{S}_{C} = \frac{?}{T_{C}}$$	Q	Q				
	FBQ	For a reversible process the entropy of a closd system is	constant	constant				
	FBQ	Given the ideal gas equation $$PV=nRT$$, then we can obtain the equation $$(\frac{\partial{P}}{\partial{V}})_{T}=\frac{?}{V}$$	P	P				
	FBQ	In an isoenthalpic expansion, the change in temperature of a gas with change in pressure at constant is measured	enthalpy	enthalpy				
	FBQ	In the equation $$\eta=(\frac{\partial{T}}{\partial{V}})_{U}$$, $$eta=0$$ for a gas	ideal	ideal				
	FBQ	In the equation $$\eta=(\frac{\partial{T}}{\partial{V}})_{U}$$, $$eta$$ is called the coefficient	Joule	Joule				
	FBQ	equations are the equations which express the internal energy of a system as a function of the variables defining the state of the system.	Energy	Energy				
	FBQ	For a expansion, $$Q=W=0$$ and $$dU=0$$	free	free				
	FBQ	Give that $$dQ=dU+PdV$$ and $$dV=0$$, then the process is	isochoric	isovolumic				
	FBQ	Give that $$dQ=dU+PdV$$ and $$dQ=0$$, then the process is	adiabatic	adiabatic				
	FBQ	Isothermal compressibility and magnetic susceptibility are examples of constant	force	force				
	FBQ	The measure or degree of the disoderliness of a system is called	entropy	entropy				
	FBQ	The energy equation $$(\frac{\partial{H}}{\partial{T}})_{P}=C_{P}$$ means that the heat capacity at constant pressure is equal to the of an isobaric line on the $$H-T-P$$ surface	slope	slope				
	FBQ	The energy equation $$H=U+PV$$, H is called the	enthalpy	enthalpy				

	FBQ	The equation $$(\frac{\partial{Q}}{\partial{T}})_{V}$$ is an expression of [ ] at [ ]	heat capacity, constant volume	heat capacity, constant volume				
	FBQ	Thermal expansivity, heat capacity and force constant are examples of [ ] functions	response	response				
	FBQ	Thermocouple thermometer is based on the [ ] effect	Seebeck	Seebeck				
	FBQ	The [ ] law of thermodynamics forms the basis of the definiftion of temperature	zeroth	zeroth				
	FBQ	The direction of heat flow in a system is given by the temperature [ ] in it	gradient	difference				
	FBQ	Given that $$u=x^{2}lny$$, then $$\frac{{\partial}^{2}u}{\partial{x}\partial{y}}=\frac{{\partial}^{2}u}{\partial{y}\partial{x}}$$ = [ ]	2x/y	2x/y				
	FBQ	If $$x=zy^{2}$$, then $$\left(\frac{\partial{x}}{\partial{y}_{z}}\right)$$ = [ ]	2zy	2yz				
	FBQ	[ ] equation is the equation of state for real gas	Van der Waals	Van der Waals				
	FBQ	A thermodynamic process that occurs at constant volume is called [ ] process	isochoric	isovolumic				
	FBQ	A thermodynamic process in which there is no heat transfer into or out of the system is called [ ] process	adiabatic	adiabatic				
	FBQ	[ ] systems do not allow either energy or mass to flow between them and the surrounding	isolated	Isolated				
	FBQ	A type of boundary that allows exchange of heat is called [ ] boundary	diathermal	diathermal				
	FBQ	A system whose boundary allows transfer of mass and energy into or out of it is called [ ] system	open	open				
	FBQ	[ ] is a restricted region of space or a finite portion of matter or the part of the universe, with well-defined boundaries chosen for study.	system	system				

	FBQ	_____ is the study of the effects of work, heat, and energy on a system and it deals only with the large-scale response of a system, which can be observed and measured.	thermodynamics	thermodynamics				
	MCQ	Which of the following methods is NOT used for the production of low temperature?	evaporation	liquefaction	adiabatic demagnetization	throttling	D	
	MCQ	An irreversible steady flow expansion process in which a perfect gas is expanded through an orifice of minute dimensions is known as	thermal expansion	adiabatic flow	throttling	decompression	C	
	MCQ	Liquefaction can be acchieved by the following processes EXCEPT	by compressing the gas at temperatures less than its critical temperature	by making the gas do some kind of work against an external force, thereby causing the gas to lose energy	by making the gas do work against its own internal forces, thereby causing it to lose energy	by supplying energy from an external source, therby causing the gas to expand	D	
	MCQ	Which of the following is correct about superconductivity?	it is the disappearance of electrical conductivty of metal at low temperature	it is the disappearnce of thermal resistance of a superfluid at low temperature	it is the disappearnce of thermal resistance to heat flow of an alloy at high temperature	it is the disappearnce of electrical resistance of a metal or an alloy at low temperature	D	
	MCQ	The following are correct Maxwell thermodynamic relations EXCEPT	$${\frac{\partial{T}}{\partial{V}}}_{S}=-{\frac{\partial{P}}{\partial{S}}}_{V}$$	$${\frac{\partial{P}}{\partial{T}}}_{T}={\frac{\partial{S}}{\partial{P}}}_{V}$$	$${\frac{\partial{S}}{\partial{V}}}_{T}=-{\frac{\partial{P}}{\partial{T}}}_{V}$$	$${\frac{\partial{S}}{\partial{P}}}_{T}=-{\frac{\partial{V}}{\partial{T}}}_{P}$$	B	
	MCQ	A heat engine is supplied with 300 kJ/s of heat at 600 K, and rejects 100 kJ/s at 300 K. The data refers to	reversible cyle	irreversible cycle	impossible cycle	None of the above	C	
	MCQ	Which of the following is NOT a correct form of Gibbs free energy?	G = U - TS + PV	G = H - TS	G = A + PV	G = PdV +QdS	D	
	MCQ	The following are correct EXCEPT	Second order phase transition is one in which there are changes in entropy and volume	First order phase transition is one in which the first-order derivatives of the Gibbs function change discontinuously.	Second order phase transition is one in which the second derivates of Gibbs function are finite	First order phase transition is one there are changes in entropy and volume	A	
	MCQ	A Carnot heat pump is used to heat a house to a temperature of 294 K. How much work is done by the pump to deliver 3 350 J of heat into the house when the outdoor temperature is 260 K?	32.4 kJ	21.3 kJ	45.7 kJ	17.1 kJ	A	
	MCQ	Which law of thermodynamics is the basis for the definition of internal energy?	third	first	second zeroth	zeroth	B	
	MCQ	What is the maximum efficiency of a heat engine operating between the temperature of $$100^{o}C$$ and $$400^{o}C$$?	$$45%$$	$$35%$$	$$60%$$	$$50%$$	A	
	MCQ	Which of the following is NOT a thermodynamic potential?	enthalpy	Hemoltz free energy	Gibbs free energy	entropy	D	

	MCQ	Identify which of the following equations is the wrong form of the thermodynamic potential	dV = TdS - PdV	dH = TdV-VdP	dA = SdT - PdV	dG = SdT + VdP	B
	MCQ	The physical principle on the Gay-Lussac_Joule experiment is based is the ---------- law of thermodynamics	first	second	third	zeroth	A
	MCQ	It is NOT possible to completely convert	heat into thermal energy	mechanical energy into internal energy	internal energy into mechanical energy	internal energy into heat	C
	MCQ	For a cyclic process	$$dU=0$$	$$dQ=0$$	$$dV=0$$	$$Q=W=0$$	C
	MCQ	What is the maximum coeficient of performance for a refrigerator operating between temperatures of 200 K and 300 K?	1/2	2/3	3/2	2	D
	MCQ	Which law of thermodynamics is the basis for the definition of entroy	first	second	third	zeroth	B
	MCQ	The correct SI unit of entropy is	$$Jkg^{-1}K$$	$$Jkg^{-1}K^{-1}$$	$$JK^{-1}$$	$$JK$$	C
	MCQ	The term "entropy" is defines ----------	the internal energy of a system	a measure of the disorder of a system	rate of flow of energy in a system	the amount of heat per unit mass stored in a system	B
	MCQ	Joule -Thomson experiment was designed to measure the dependence of the -------- of a gas on its ----------	internal energy -- volume	heat ----- temperature	temperature--- volume	enthalpy ---- pressure	D
	MCQ	If the ideal gas equation is given as $$PV=nRT$$, where the symbols have their usual meaning, which of the following is the correct equation for an ideal gas at constant temperature?	$$\left (\frac{\partial{T}} {\partial{V}} \right)_{U}=-\frac{P} {T}$$	$$\left (\frac{\partial{U}} {\partial{V}} \right)_{U}=-\frac{P} {T}$$	$$\left (\frac{\partial{P}} {\partial{V}} \right)_{T}=-\frac{P} {V}$$	$$\left (\frac{\partial{V}} {\partial{P}} \right)_{T}=\frac{P} {V}$$	C
	MCQ	The enthalpy H, for an ideal gas, is a function of ---------- only	volume	temperature	pressure and temperature	internal energy	B
	MCQ	Gay-Lussac and Joule experiment was designed to measure the dependence of the ---------- of a gas on its ----------	internal energy -- volume	heat ----- temperature	temperature--- volume	enthalpy ---- pressure	A
	MCQ	The specific heat capacity at constant pressure is equal to the slope of an ---------- line on the H-T-P surface.	adaibatic	isochoric	isobaric	isothermal	C
	MCQ	The correct equation enthalpy equation for a PVT system is ----------	$$H=U+PV$$	$$H=PV$$	H=PV/T	H=PV/T+1	A
	MCQ	The specific heat capacity at constant volume is the slope of ---------- line on U-T-V surface	isobaric	isothermal	isochoric	adiabatic	C
	MCQ	The internal energy U, for an ideal gas, is a function of ---------- only	temperature	pressure	pressure and temperature	unternal energy	A
	MCQ	For an ideal gas, the value $$eta$$ in the equation $$\eta=\left (\frac{\partial{T}}{\partial{V}} \right)_{U}$$ is	1/2	1	0	infinity	C
	MCQ	In the equation $$\eta=\left (\frac{\partial{T}}{\partial{V}} \right)_{U}$$, $$\eta$$ is called ----------	Gay-Lussac's constant	Joule coefficient	Dulong constant	Petit constant	B

MCQ	The thermocouple is base on a physical principle known as ---------- effect	stark	photoelectric	Seebeck	Joule	C	
MCQ	One end of a metal rod is heated by a flame and the other end is is used to melt ice. This process is possible through	translational motion of the atoms from one end of the rod to the other	successive collisions of vibrating atoms of the rod	radiation of heat from one end of the rod to the other	diffusion of atoms from one end of the rod to the other	B	
MCQ	A wall that thermally insulates one system from another system is called ---------- wall	diathermal	isothermal	adiabatic	isobaric	C	
MCQ	The statement that "two objects each have the same temperature with a third object and therefore their temperatures are equal" is the ---------- law of thermodynamics	third	second	zeroth	first	C	
MCQ	At what temperature will the Celsius and the Fahrenheit temperature scales record the same reading?	$${-}30^{o}C$$	$$30^{o}C$$	$$40^{o}C$$	$${-}40^{o}C$$	D	
MCQ	The land see breezes are due to ---------- as a means of heat transfer	conduction	convection	radiation	diffusion	B	
MCQ	Which of the following statements is correct?	free electrons are responsiible for thermal and electrical conductivity	free electrons are responsiible for thermal but NOT electrical conductivity	free electrons are responsiible for electrical but NOT thermal conductivity	free electrons are responsiible for neither thermal nor electrical conductivity	A	
MCQ	Which of the following is incorrect about a thermodynamic system?	an open system has adiabatic walls,	a closed system allows the flow of energy only across its boundaries	an open system allows the flow of both mass and energy across its boundaries	an isolated system does not allow the flow of both mass and energy across its boundaries	A	
MCQ	If $$U(x,y) = 2x^{2}y + y^{2}$$, Calculate $$\frac{\partial U}{\partial y}$$	$$x + 2y$ $	$y+y^{2}$	$4xy$	$2(2x^{2} +y)$	D	
MCQ	Which of the following may not be classified as a thermodynamic coordinate	temperature,,	intermolecular spacing,	volume	specific heat capacity at constant pressure	B	
MCQ	Which of the following is not an equation of state?	van der Waals for real gases	Dalton’s law of partial pressures	ideal gas equation	None of the above	D	
MCQ	The first law of thermodynamics is valid only	if no work is done on the system	when there is no friction	if there is no heat loss or gain	if the system is isolated	D	
MCQ	A process that is carried out in such a way that at every instant, the system departs only infinitesimal from an equilibrium state is said to be ----------	isothermal	adiabatic	quasistatic	reversible	C	
MCQ	Which of the following is not an intensive (or in-extensive) property of a thermodynamic system?	ressure,	volume,	temperature,	density	B	
MCQ	Two thermodynamic systems cannot be said to be in mechanical equilibrium with each other if there is	a net force in the interior of each of them,	pressure gradient between them,	no net force in the interior of each of them and on their boundaries,	the boundary between them moves	C	
MCQ	A cyclic process is one in which	no heat is transfered into or out of the system,	there is no change in pressure of the system,	there is no change in volume of the system,	there no change in the internal energy of the system	D	

☐	MCQ	If two bodies (systems) are in thermal equilibrium with a third body the they are in thermal equilibrium with each other. This is the statement of which law of thermodynamics?	zeroth law	first law	second law	third law	A	
☐	MCQ	A thermodynamic process whereby no heat flows into or out of a system is	isochoric,	adiabatic,	isothermal,	isobaric	B	
☐	MCQ	Which of the following may not be classified as a thermodynamic coordinate?	temperature,,	intermolecular spacing,	volume	specific heat capacity at constant pressure	B	
☐	MCQ	Which of the following is incorrect about a thermodynamic system?	an open system has diathermal boundaries, ,	a closed system allows the flow of energy only across its boundaries	an open system allows the flow of both mass and energy across its boundaries	an isolated system does not allow the flow of both mass and energy across its boundaries	A	

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