PRN: Course Code : **USS301**

Second Year **B.Sc.** End Semester Examination Winter 2023

Physics - III

Day and Date: Tuesday, 28/11/2023 Max Marks: **100**

Time : 2.00 to 5.00 PM Duration: **03** hrs

Instructions:

- All questions are ***compulsory***
- Figures to the ***right*** shows ***full marks***
- ***Digital gadgets*** are ***not allowed***

		Marks	Bloom's Level	CO
Q.1	**Attempt the following**			
a)	State and explain zeroth and first law of thermodynamics.	08	L1	CO1
b)	Explain reversible and irreversible processes and give suitable examples of it.	08	L2	CO1
c)	With the help of first law of thermodynamics obtain an expression for the work done in an isothermal process.	09	L3	CO1
	OR			
d)	Define the term enthalpy. Obtain equation of enthalpy.	09	L1	CO1
Q.2	**Attempt the following**			
a)	Derive the Joule Thomson effect for real gases.	08	L3	CO2
b)	Derive the first TdS equation from Maxwell's equations of thermodynamics.	08	L3	CO2
c)	Derive Clausius-Clapeyron equation using Maxwell's equations of thermodynamics.	09	L4	CO2
	OR			
d)	Find expression for Cp/Cv for real gas	09	L2	CO2
Q.3	**Attempt the following**			
a)	Obtain expressions for average velocity and most probable velocity of a gas molecule.	08	L3	CO3
b)	Write a note on degrees of freedom.	08	L1	CO3

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c)	Explain i. Root mean square (RMS) velocity ii. Most probable speed iii. Mean free path	09	L2	CO3
	OR			
d)	Write note on viscosity of gases. Find the coefficient of viscosity.	09	L1	CO3
Q.4	**Attempt the following**			
a)	Write a note on Wein's black body.	08	L1	CO4
b)	Deduct the Wein's distribution law from plank law of radiation.	08	L4	CO4
c)	Derive Maxwell-Boltzmann statistics to distribute N particles among different cells.	09	L4	CO4
	OR			
d)	Discuss the experimental study of blackbody radiation spectrum.	09	L3	CO4

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