

F.Y.B.SC. SEM – II (2014 Course) : WINTER - 2018
SUBJECT: PHYSICS: KINETIC THEORY & THERMODYNAMICS

Day: Friday
Date: 12/10/2018

Time: 03.00 PM TO 05.00 PM
Max. Marks: 40

W-2018-0785

N.B:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.

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- Q.1** Attempt **ANY TWO** of the following: [10]
- a) Explain construction and working of Diesel heat engine.
 - b) Derive Vander Waal's equation of state for real gas.
 - c) Define the efficiency of Carnot's engine. Find the efficiency of the Carnot's engine working between steam point and ice point.
- Q.2** Attempt **ANY TWO** of the following: [10]
- a) Write a note on real gases.
 - b) State and explain first law of thermodynamics.
 - c) A 1.2 liter of hydrogen at 137°C and 10^6 dyne cm^{-2} pressure expands isothermally, until its volume is doubled. Find the pressure of gas.
- Q.3** Attempt **ANY TWO** of the following: [10]
- a) What is Carnot's cycle? Explain it in detail.
 - b) Derive expression for work done during an adiabatic process.
 - c) Write a note on refrigeration.
- Q.4** Attempt **ANY FIVE** of the following: [10]
- a) What are the corrections to Van der Waals equation of state?
 - b) State different types of systems.
 - c) What is T-S diagram and state its importance.
 - d) State Kelvin's statement.
 - e) Give any two assumptions for kinetic theory of gases.
 - f) What are the thermodynamic variables?
 - g) The resistance of platinum wire at 0°C is 5.5Ω and at temperature t is 7.5Ω . Find temperature of wire, if coefficient of temperature for platinum = $0.0039/^{\circ}\text{C}$.

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