SUBJECT: Physical Chemistry I   **COURSE CODE: CC-II**

FULL MARKS: 10   **TIME: 1.00 P.M. – 2.00 P.M.**

DATE: 17-01-2022

Answer any two questions.   **2 x 5 = 10**

1. (a) Prove for an ideal gas, $C_p - C_v = nR$.

   (b) Establish the relation between absolute temperature and volume for an adiabatic reversible process.

2. Depict a clear picture of Carnot cycle and derive the efficiency of a Carnot engine.

3. (a) 'The balanced chemical equation of a reaction does not give the order of that reaction'- elucidate.

   (b) Decomposition of a substance A is studied at two different initial concentration a_1 and a_2, where $a_1 = 3a_2$. If the observed half-lives follow the ratio 2:1. Find the order of the decomposition process.

4. Discuss unimolecular collision theory as proposed by Lindemann.

5. (a) For a given gas the Maxwell's speed distribution pattern in three dimension changes with temperature. Draw the speed distribution curve at various temperatures and explain the nature of the curves.

(b) What is the basic difference between nature of speed and energy distribution curve and why?

Send your answer script in a single .pdf file to the E-mail id: gtm.icbu@gmail.com mentioning your

Roll Number in the subject line.