

BACHELOR OF SCIENCE (CBCS-2018 COURSE)
F. Y. B. Sc. Sem-II :SUMMER- 2022
SUBJECT : PHYSICS : KINETIC THEORY & THERMODYNAMICS

Day : Monday
Date : 4/7/2022

S-18319-2022

Time : 11:00 AM-02:00 PM
Max. Marks : 60

N.B.

- 1) All questions are **COMPULSORY**.
 - 2) Figures to the **RIGHT** indicate **FULL** marks.
 - 3) Draw neat and labeled diagrams **WHEREVER** necessary.
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Q 1. Attempt any **Two** of the following. **(12)**

- (a) Derive an expression for the work done during an isothermal change.
- (b) With neat suitable diagram explain Carnot's heat engine.
- (c) Derive Clausius-Clapeyron equation.

Q 2. Attempt any **Two** of the following. **(12)**

- (a) Derive an equation for the state of an ideal gas.
- (b) Write down the construction and working of Otto engine with neat suitable diagram.
- (c) Describe the critical constants.

Q 3. Attempt any **Two** of the following. **(12)**

- (a) Explain indicator diagram.
- (b) Describe an efficiency of Carnot's heat engine and derive its equation.
- (c) With neat suitable diagram write down the construction and working of refrigerator.

Q 4. Attempt any **Three** of the following. **(12)**

- (a) Differentiate between ideal gas and real gas.
- (b) Derive an expression for work done during an adiabatic change.
- (c) Explain the relation between the Boyle's temperature and critical temperature.
- (d) Derive an expression for change in entropy during the reversible process.

Q 5. Attempt any **Four** of the following. **(12)**

- (a) Differentiate between reversible and Irreversible process
- (b) Find the efficiency of Carnot's engine working between the steam point and ice point.
- (c) Calculate the work done per mole in an isothermal expansion of a Van-der-waal's gas from volume V_1 to V_2 .
- (d) Explain the first and the second law of thermodynamics.
- (e) Write a short note on entropy.
- (f) Find the coefficient of performance of Carnot refrigerator working between the temperature 227°C and 27°C .

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