

(FOR THE CANDIDATES ADMITTED
DURING THE ACADEMIC YEAR
2017 ONLY)

(NO.OF PAGES: 2)

17 UPS 203

REG.No.

NGM COLLEGE (AUTONOMOUS) : POLLACHI

END – OF – SEMESTER EXAMINATIONS : JUNE - 2021

B.Sc.-PHYSICS

MAXIMUM MARKS: 75

II - SEMESTER

TIME: 3 HOURS

PART – III

HEAT AND THERMODYNAMICS

SECTION – A

(10 X 1 = 10 MARKS)

ANSWER ALL QUESTIONS.

MULTIPLE CHOICE QUESTIONS.

1. The specific heat of electricity is also known as _____.
a) Hall coefficient b) Seebeck coefficient
c) Peltier coefficient d) Thomson coefficient
2. The kinetic energy per unit volume of a perfect gas is equal to _____.
a) $\frac{2}{3}P$ b) $\frac{3}{2}P$ c) $\frac{P}{3}$ d) $\frac{1}{2}P$
3. Thermal conduction in metals takes place by _____.
a) Free electrons b) Bound electrons
c) Vibrations of molecules d) None of the above
4. The last gas to be liquefied was _____.
a) Oxygen b) Hydrogen
c) Nitrogen d) Helium
5. In Carnot cycle, the first step is _____.
a) Isothermal expansion b) Isothermal compression
c) Adiabatic expansion d) Adiabatic compression

SHORT ANSWERS.

6. Define specific heat of a gas.
7. State the law of equipartition of energy.
8. Explain coefficient of thermal conductivity.
9. Give any two uses of liquid air.
10. What is Heat?

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SECTION-B

(5X5=25 MARKS)

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS.

11. a) Discuss the function of thermo electric diagram and give its various uses.
(OR)
b) Describe the working of a continuous electric calorimeter for the measurement of C_p of a gas.
12. a) Show that derivation of gas equation from the kinetic theory of gases.
(OR)
b) Discuss degrees of freedom. Mention limitations of Vander Waals equation.
13. a) Define temperature gradient and thermal conductivity. Establish equation of heat conduction.
(OR)
b) What is black-body radiation?. Explain its temperature dependence.
14. a) Explain the principle of cascaded cooling liquefaction of oxygen with neat diagram.
(OR)
b) Discuss the properties of Helium I and Helium II.
15. a) What is meant thermodynamic equilibrium. What are the basic requirements to be strictly followed?
(OR)
b) Define entropy. Discuss the physical meaning of entropy.

SECTION - C

(4X10 = 40 MARKS)

ANSWER ANY FOUR OUT OF SIX QUESTIONS. (16th QUESTION IS COMPULSORY AND ANSWER ANY THREE QUESTIONS FROM Qn. No.17 to 21)

16. Describe the cylindrical shell method of determining the thermal conductivity of poor conductor.
17. Discuss Dulong and Petit's law. Explain the variation of the atomic heat of a substance with temperature.
18. Derive and discuss the Vander Waals equations of state of a gas.
19. Describe an experiment to verify Stefan's law and determination of the Stefan's constant.
20. Describe Linde's process for the liquefaction of air with neat diagram.
21. Show that during a reversible adiabatic process the entropy of the system remains constant.
