

Unit IV

8. (a) Describe Clausius latent heat equation and give its significance. 4
- (b) Explain the following terms : 4
- (i) Internal Energy (U)
 - (ii) Helmholtz function (F)
 - (iii) Enthalpy (H)
 - (iv) Gibbs function (G)
9. (a) Discuss the variation of intrinsic energy with volume for perfect gas and Van der Wall gas. 4
- (b) State and prove Stefan's law. 4

Roll No.

Exam Code : M-21

Subject Code—52529

B. Sc. EXAMINATION

(Re-appear Batch 2017)

(Third Semester)

PHYSICS

Paper-V

PH-301

Computer Programming and Thermodynamics

Time : 3 Hours

Maximum Marks : 40

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. 1 is compulsory.

1. (a) Convert the following decimal numbers into corresponding binary equivalent :
- (i) 36
 - (ii) 24.8. 2

- (b) Write a FORTRAN program segment to print numbers 10 through 100. 2
- (c) Using first law of thermodynamics, explain, why the total energy of an isolated system is always constant ? 2
- (d) What do you understand by triple point of a substance ? 2

Unit I

- 2. (a) Draw a flow chart to find the smallest number among given N numbers. 4
- (b) Describe various built in functions in FORTRAN. 4
- 3. (a) Write the general syntax of IF statement. Using MOD function, write a FORTRAN program to check whether a given number is prime or not. 4
- (b) How are two dimensional arrays treated in FORTRAN ? Explain with suitable example. 4

Unit II

- 4. Write an algorithm to arrange a list of given numbers in descending order and also draw the corresponding flow chart. 8
- 5. (a) Write a FORTRAN program to find the roots of a quadratic equation. 4
- (b) Write a FORTRAN program to calculate the integration of a function using Trapezoidal rule. 4

Unit III

- 6. (a) Write the Kelvin and Clausius statements of second law of thermodynamics and show that these two are equivalent. 4
- (b) What do you understand by absolute scale of temperature ? Show that absolute scale of temperature and perfect gas scale are identical. 4
- 7. (a) What is Joule-Thomson effect ? Discuss its analytical treatment. 4
- (b) Discuss the liquefaction of Hydrogen and Helium. 4