Roll No. .....

(12/24)

5197

B. Sc. EXAMINATION

(Third Semester)

PHYSICS

PH-301

Computer Programming and Thermodynamics

Time : Three Hours *Maximum Marks :* 40

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. **1** is compulsory. All questions carry equal marks. Scientific calculator is allowed for numerical calculations.

1. (a) Differentiate among primary, secondary and cache memory. 2

   (b) What is the flow chart and explain the function of symbols used in it. 2

(c) What do you mean by Thermodynamic systems ? 2

(d) Give the difference between gas and vapour. 2

Unit I

2. List the various control statements in FORTRAN and explain them with examples. 8

3. Discuss the basic organization of a computer system along with its block diagram and explain its functions. 8

Unit II

4. Write an algorithm, flow chart and FORTRAN programme to compute the Matrix multiplication. 8

5. Calculate $\int_0^{\pi/2} \sin x\,dx$ using Simpson's 1/3 rule and find the error also. 8

Unit III

6. Describe the method of liquification of hydrogen and helium using Joule-Thomson effect. 8

7. (a) What is Entropy ? Show that change in entropy of a substance in a cyclic process is zero. 5

(b) One mole of a gas expands isothermally to four times its volume. Calculate the change in entropy in terms of gas constant. 3

Unit IV

8. What do you mean by enthalpy H and Gibbs' function G ? Show that $\left(\frac{\partial H}{\partial T}\right)_P = C_P$. 8

9. (a) The co-ordinates of the triple point of the water are $t = 0.0075°C$ and $p = 0.006$ atmospheres. Calculate the slope of ice line in atmospheres/°C. 3

(b) With the help of suitable Maxwell's relation prove that temperature increases during the adiabatic expansion. 5