## PHYSICS

**SECTION A**                                                                 **(2*1=2)**

1.A swimmer completing one (return) trip from one back of a river to the other and back, is it a periodic motion, why?

2. Which of the following relationship between the acceleration and displacement X of a particle involve SHM ?

(a) $a=0.7\ x$              (B) $a=-200\ x^2$              (C)  $-10\ x$              (D)  $100\ x^3$

**SECTION B**                                                                 **(4*2=8)**

3. Differentiate between damped and undamped oscillations

4. Obtain the Expression for displacement of a system executing SHO along X axis

5. why $C_p$ is always greater than $C_v$? prove that $C_p-C_v = R$.

6.State and explain Weins displacement law and Stefans law.

**SECTION C**                                                                 **(5*3=15)**

7.Derive the expression for excess pressure inside a liquid drop of radius R. distinguish it from

   the excess pressure inside an air bubble in a liquid.

8. state pascals law? Draw a neat diagram and briefly explain the working of hydraulic lift based

   on pascals law?

9. Derive the Expression for Kinetic Energy, Potential Energy and show that total energy in SHO

   is conserved

10. A 5 kg object is attached to a spring of spring constant 500 N/M. It slides without friction
    over a horizontal surface Object is displaced 10cm from its equilibrium position and released.
    Calculate the (i) Time period
             (II) Max.Speed

(III) Max. Acceleration of the object.

11.A spring of spring constant 1200 N/M is placed on horizontal table. A mass of 3 kg is attached to the free end of a spring, pulled sideways to a distance of 2 cm and released. Determine

(a)The frequency of oscillation of mass

(b)The maximum acceleration of the mass

(c)The maximum speed of the mass

**SECTION D**                                                                                     **(2*5=10)**

12. Explain and obtain the expression for time period of oscillation of a simple pendulum executing SHO.

(b) What are the factors depending on the period of a Simple Pendulum.

13.State Bernoulli's theorem. By using this theorem prove that total energy per unit mass remains constant, in a streamline flow of an ideal liquid through a pipe of varying area of cross section.