PHYSICS –I
Subject Code: AHL001

Time Allowed: 03 hours.   Maximum Marks: 100

Before answering the question paper the candidate should ensure that they have been supplied the correct question paper. Complaints in this regard, if any, shall not be entertained after the examination.

Note: Attempt any five questions and all questions carry equal marks.

SECTION-A

1. (a) Explain the terms unit, fundamental and derived units. Write the characteristics of a standard unit.  
   (10)
(b) State and prove triangular & parallelogram law of vector addition.  
   (10)

2. (a) State and prove principle of conservation of linear momentum.  
   (10)
(b) What do you mean by banking of tracks? Derive an expression for the banking of angle  
   (10)

3. (a) State and prove principle of conservation of energy.  
   (10)
(b) Determine work done against friction when a body moves over a horizontal surface.  
   (5)
(c) A force of 10N displaces an object through 20cm and does work of 1J in the process. Find the angle between the force and the displacement.  
   (5)

SECTION-B

   (5)
(b) Explain modulus of elasticity and its various forms.  
   (10)
(c) A metal wire 75cm long and 0.130 cm in diameter stretches 0.035cm when a load of 8.0 kg is hung on its end. Find the stress, strain and the Young’s modulus for the Material of the wire.  
   (5)

5. (a) What are different three modes of transfer of heat?  
   (5)
(b) Describe the principle, construction and working of a platinum resistance thermometer. Give its merits and demerit.  
   (10)
(c) Convert 90ºF into Kelvin scale.  
   (5)

6. (a) What is magnetostriction oscillator? Explain its principle and working.  
   (10)
(b) Explain in detail applications of ultrasonic to cold welding, drilling, cleaning, flaw detection and SONAR.  
   (10)