Roll. No………………………… 1211022

Diploma / Integrated B.Tech 1 st Sem Examination
June, 2014
Physics - I (2012 Batch)
Subject Code:  AHL-001

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: Question No. 1 is Compulsory and attempt two questions from each section. All questions carry equal marks.

1(a) Check the correctness of the equation \( S = ut + \frac{1}{2}at^2 \). [5]
(b) State Newton’s three laws of motion. Give suitable examples of each. [5]
(c) Write a short note on transformation of one form of energy into another with examples. [5]
(d) What are the differences between light and sound waves? [5]

SECTION-A

Q.2(a) What is principle of homogeneity of dimensions? Give uses and limitations of dimensional analysis. [10]
(b) \( \vec{A} = \hat{i} - 2\hat{j} + 3\hat{k} \) and \( \vec{B} = -2\hat{i} + \hat{j} + 4\hat{k} \) Find the value of \( \vec{A} \cdot \vec{B} \) [10]

Q.3(a) What do you mean by centripetal force? Derive an expression for it. [10]
(b) Derive relations between linear velocity and angular velocity, linear acceleration and angular acceleration. [10]

Q.4(a) Derive expression for the work done by a body against friction when a body moves over a horizontal surface. [10]

SECTION-B

Q.5(a) Define Young’s modulus, bulk modulus, modulus of rigidity and Poisson ratio. Drive relation connecting any three of them. [10]
(b) Drive an expression for bending moment of a rectangular bar supported at two ends and loaded at the centre. [10]

Q.6(a) Describe the principle, construction and working of a platinum resistance thermometer. Give its merits and demerits. [10]
(b) Discuss the principles of measurement of temperature. [10]

Q.7(a) Explain the construction and working and magnifying power of compound microscope. [10]
(b) What do you mean by acoustic of buildings? Explain the following terms.
(i) Echo  (ii) Reverberation
(iii) Reverberation time  (iv) Noise  [10]