Roll. No…………………………

1211022

Diploma 1ˢᵗ Semester Examination
Jan.2014
Subject – Physics-I
Subject Code: AHL-001

Time Allowed: 03 hours.   Maximum Marks: 100

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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.

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

1. a) What do you mean by refraction of light? Explain its laws.   (5)

    b) Distinguish between conduction, convection and radiation.   (5)

    c) State Newton's IInd law of motion. Using it, derive the force equation.   (5)

    d) Define the term power and write its unit and dimensional formula. Differentiate between the units kWhr and kW.   (5)

SECTION-A

2. a) Explain CGS, MKS and SI system of units in detail. Write the units of force and work in all the three systems.   (10)

    b) What is principle of homogeneity of dimensions? Give uses and limitations of dimensional analysis. Convert a velocity of 36 km/hr into m/s using principle of homogeneity of dimensions.   (10)

3. a) What is total internal reflection (TIR)? Explain with proper ray diagram. Define critical angle. What are the conditions for TIR?   (10)

    b) Explain the construction, working and magnifying power of Astronomical telescope.   (10)

4. a) Define reverberation. Explain it with an example. What do you mean by reverberation time? What are the methods to reduce reverberation time?   (10)

(b) Derive the relation between velocity, frequency and wavelength of a wave. What is the importance of this relation? A hospital uses an ultrasonic scanner to locate tumors in a tissue. What is the wavelength of sound in a tissue, in which the speed of sound is 1.7 Km/s? The operating frequency of the scanner is 4.2 MHz.   (10)

SECTION-B

1. a) What are different scales of temperature? Write relationship between all of them. Convert 100° F into centigrade scale.   (10)

    b) Describe the principle, construction and working of a platinum resistance thermometer. Give its merits and demerits.   (10)

6. 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. A car is racing on a circular track of 180m radius and of banking angle 30º. To avoid the chances of skidding what should be the speed of the car?   (10)

7. a) State and prove principle of conservation of energy.   (10)

    b) Determine work done against friction when   (10)

    i.   A body moves over a horizontal surface.

    ii. A body moves up an inclined plane.