**Instructions**

1. **The test contains seven questions**

**Q1** Fill in the blanks 10 Marks

(a) The volume of a cube of side 1 cm is equal to .....

(b) The surface area of a solid cylinder of radius 2.0 cm and height 10.0 cm is equal to ...

(c) A vehicle moving with a speed of covers....m in 1 s

(d) The relative density of lead is 11.3. Its density is .... or .....

**Q2** A calorie is a unit of heat or energy and it equals about 4.2 J where. Suppose we employ a system of units in which the unit of mass equals, the unit of length equals, the unit of time is. Show that a calorie has a magnitude in terms of the new units. 10 Marks

**Q3** The mass of a box measured by a grocer’s balance is 2.300 kg. Two gold pieces of masses 20.15 g and 20.17 g are added to the box. What is

(a) the total mass of the box,

(b) the difference in the masses of the pieces to correct significant figures ? 10 Marks

**Q4** A book with many printing errors contains four different formulas for the displacement *y* of a particle undergoing a certain periodic motion :

(a)

(b) *y* = *a* sin *vt*

(c) *y* = (*a/T*) sin *t/a*

(d)

(*a* = maximum displacement of the particle, *v* = speed of the particle. *T* = time-period of motion). Rule out the wrong formulas on dimensional grounds. 10 Marks

**Q5** The farthest objects in our Universe discovered by modern astronomers are so distant that light emitted by them takes billions of years to reach the Earth. These objects (known as quasars) have many puzzling features, which have not yet been satisfactorily explained. What is the distance in km of a quasar from which light takes 3.0 billion years to reach us ?

10 Marks

Q6: The centripetal force is of the form , find the values of a, b , c. 10 Marks

Q7:  . The value of n is? 10 Marks