Roll No. …..……... **Total Pages: 02**

PC 1212-MH

AS/2058

MECHANICS—II, Paper—A

Semester-II

Time Allowed : Three Hours] [Maximum Marks : 30

Note : The candidates are required to attempt *two* questions each from Sections A and B carrying 5 marks each and *five* questions from Section C consisting of 7 short answer type questions carrying 2 marks each.

SECTION-A

1. Derive Euler's equations of rotation of a rigid body about a fixed axis. . 5
2. What are Galilean transformations. Show that law of conservation of energy is invariant under these transformations. 5
3. Find the moment of inertia of a diatomic molecule. 5
4. What are the characteristics of a rigid body ? Obtain an expression for rotational kinetic energy of a rigid body. 5

SECTION-B

5. Derive Lorentz transformation equations. 5

6. Two photons are moving towards each other. Calculate their relative velocity. 5

7. What do you mean by space time continum ? Explain Minsbowskispace. 5

8. Explain the variation of mass with velocity. 5

SECTION-C

(Attempt any ***five*** parts.)

9. (a) Give physical significance of moment of inertia.
   (b) Show that rest mass of a photon is always zero.
   (c) What is red shift ?
   (d) Give two applications of Gyroscope.
   (e) What is inertia tensor ?
   (f) What are Tachyons ?
   (g) Why length contraction is not observed in daily life?

5x2=10