[This question paper contains 2 printed pages.]

Sr. No. of Question Paper : 8584 **C** **Roll No.....**

Unique Paper Code : 222353

Name of the Paper : GEHT-304 : Physics – II

Name of the Course : B.Sc. (Hons.) Geology, Part II

Semester : III

Duration : 3 Hours

Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt **five** questions in all.
3. Question No. **1** is compulsory.

1. (a) If 12 particles are distributed randomly between two boxes A and B with equal probability, then calculate the probability of the most and the least probable distribution. (3)

   (b) Distinguish between coupled oscillations and forced oscillations. (3)

   (c) What is weightlessness ? Give two examples in support. (3)

   (d) Explain Reynolds number and also define one Poise. (3)

   (e) Differentiate between dia-, para- and ferromagnetic substances. (3)

2. (a) State and prove work energy theorem. (7)

   (b) What is meant by Galilean Transformation and Galilean Invariance ? Show that whereas length and acceleration are invariant to Galilean transformation velocity is not. (8)

3. (a) State and prove Bernoulli's theorem. Explain the lifting action of an aeroplane. (10)

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(b) How does viscosity vary with temperature and pressure ? (5)

4. (a) Obtain frequencies and configuration of normal modes of the oscillation of two pendulums of equal string length and unequal masses with their bobs connected by means of an elastic mass less spring. (10)

(b) Two equal masses m are connected with two identical mass less springs of spring constant k as shown below. Show that the angular frequencies of two normal modes of vertical oscillations are given by $\omega^2 = \left(3 \pm \sqrt{5}\right)\frac{k}{2m}$. (5)

5. (a) Prove that thermo dynamical probability is given by, $P = N!\prod_{i=1}^{k}\frac{(g_i)^{n_i}}{n_i!}$ where the symbols have their usual meanings. (10)

(b) Write a short note on Maxwell Boltzmann distribution. (5)

6. (a) Derive an expression for the magnetic field along the equatorial line of a magnetic dipole. (8)

(b) State and explain Biot- Savart law. (7)

7. Write short notes on any **three** of the following :

(a) Bougyer correction (5)

(b) Maxwell's equations (5)

(c) Geostationary Satellite. (5)

(d) Travelling waves (5)