## **B.Sc. Part- I Honours Examination, 2020**

## Subject Code - PHSA Paper Code - 2A Full Marks - 50

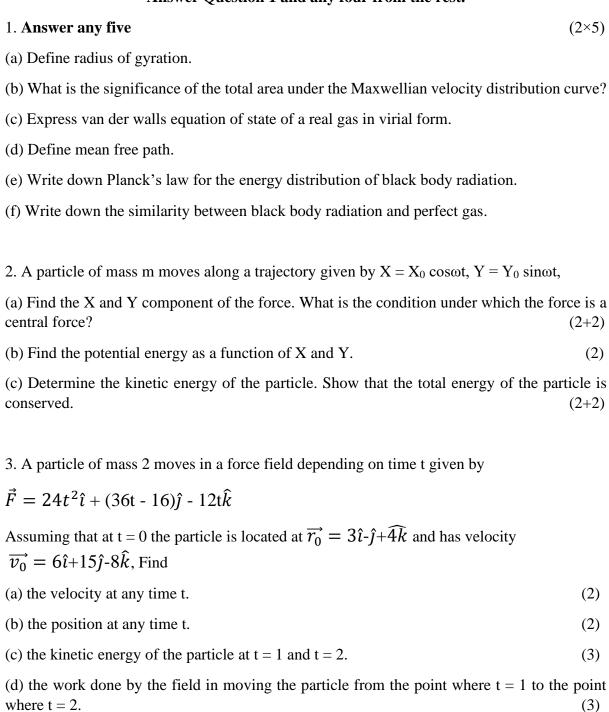
#### **Modalities**

- 1. An examinee shall not attend her/his college in person to sit for the examination of a paper. Examinee shall
  - (a) write her/his answer with BLUE/BLACK INK only.
  - (b) must attach a scanned copy of her/his registration certificate at the end of the answer script. She/he may attach a scanned copy of the admit card of current examinations, if available.
  - (c) scan the whole answer script in a single .pdf file. If it is instructed to use separate answer scripts for different modules/units, if any, examinee must do accordingly, but she/he shall create a single .pdf file for the answer script. There will be exactly one .pdf file for each examinee.
  - (d) upload her/his answer script through proper web portal to submit.
- 2. The full marks and duration of examination of a paper shall be in accord with those specified by the University of Calcutta.
- 3. For examinations of a practical paper, examinees need not submit their laboratory workbook, neither they have to face any viva. Examinees shall have to answer the questions following the instructions given in the question paper. Examinees shall use her/his own graph-papers to draw graphs (if any) in practical papers and attach them at proper positions of the answer script. Examinees shall draw circuits and graphs with BLUE/BLACK INK only.

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#### Answer Question 1 and any four from the rest.



4. For a system of particle

(a) define and state the expression of momentum. (2)

(b) define and state the expression of angular momentum.	(2)
(c) State the expression of total external torque acting on it.	(2)
(d) find the relation between angular momentum and external torque acting on it.	(4)
5. Write down the postulates of kinetic theory of gases. Find the expression for Maxwell's of distribution of velocities. What is Root Mean Square Velocity? (4+5+)	
6. (a) Colloidal particles are suspended in liquid. Using Einstein's theory, find the temper dependence of the mean square displacement per unit time.	ature (6)
(b) A particle under Brownian motion at $27^{0}$ C has an r.m.s speed 1m/sec. Find the mass of particle. Boltzmann constant $K=1.3\times10^{-23}$ J/K.	of the (4)
7. (a) Define thermal conductivity and co-efficient of thermal conductivity. Write down the unit and dimension of thermal conductivity.	ne S.I (3)
(b) What is radiation pressure?	(1)
(c) State the Newton's law of cooling. Derive Newton's law of cooling from Stefan-Boltzmann law.	1+3)
(d) The initial temperature 40°C of a body reduces to 30°C in 15 minutes. What will be the temperature of the body after 5 minutes?	ne (2)