THE INTERNATIONAL UNIVERSITY (IU) – VIETNAM NATIONAL UNIVERSITY - HCMC

FINAL EXAMINATION – CLASS

Student Name:_____Student ID:_____

Date: JUNE 2021

Duration: 48 hours (10:15 AM 22/06/2021 – 10:15 AM 24/06/2021)

GROUP 3

SUBJECT: PHYSICS 1	
Head of Department of Physics: Signature: Full name: Phan Bao Ngoc	Lecturer: Signature: Full name: Do Xuan Hoi

Question 1 (20 pts) One end of a horizontal spring with the spring constant 1900 N/m is attached to the wall, the other end is attached to a block of mass 1.15 kg. Initially, the spring is compressed 4.5 cm. When released, the spring pushes the block away and is no longer in contact with the block. The block slides along a horizontal frictionless plane.

a/ Compute the maximum speed of the block.

b/ The block goes off the edge of the plane and falls down from the plane to reach the floor with speed of 7 m/s. How high is the plane with respect to the floor?

Question 2 (20 pts) Two objects A and B with masses 10.4 kg and 4.6 kg respectively attached to two ends of a light cord that passes a very light, fixed pulley. The system is released from rest so that A and B move vertically.

a/ Use the energy consideration to find the velocity of A and B after they have moved 1.2 m.

b/ Compute the tension on each end of the cord.

Question 3 (20 pts) The system in Fig.1 is composed of two masses A (1kg) and B (3 kg) and a light spring which is not fastened to either A or B. At first, the spring is compressed and released from rest. A and B moves without friction and A has 3.6 m/s as speed.

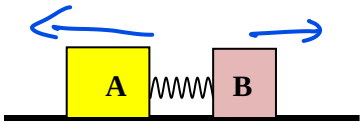

Fig.1

a/ Use the conservation of linear momentum to find the speed of B.

b/ Knowing that the spring constant is 40 N/m. Compute the compression of the spring when it was released.

Question 4 (20 pts) A cylinder of moment of inertia 0.09 kg.m^2 can rotates about a horizontal, fixed axis. It is wrapped with a light string which is pulled by a constant force for a distance of 2 m. The final angular speed of the cylinder is 20 rad/s. Suppose the friction is negligible.

a/ Find the magnitude of the force acting on the string.

b/ Knowing that the radius of the cylinder is 6 cm, find the linear speed of a point on the edge of the cylinder?

Question 5 (20 pts) A disk with mass 150 g and radius 15 cm was rotating at 11 rad/s when a beetle moves slowly from the center to the outside edge of the disk. The final angular of the disk (with the beetle) is 8.5 rad/s.

a/ Find the mass of the beetle, knowing that the moment of inertia of the disk is $I = \frac{1}{2}MR^2$

b/ Compute the kinetic energies of the system disk – beetle when the beetle was at the center and when it is at the edge of the disk. Explain the results..

END OF QUESTION PAPER