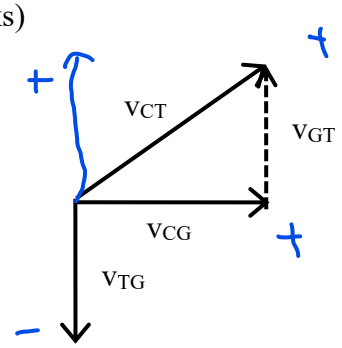
International University - VNUHCM
Department of Physics

ANSWERS

Q1. (20 marks)	**Lessons and CLOs**
(a) (10 marks) $0^2 - 10^2 = -2 \times 9.8 \times h$; $h = 5.1\,m$ (b) (10 marks) $0 = \frac{1}{2}9.8t^2 - 10t$ $t = 2.0\,s$; a) $v^2 - v_0^2 = 2as$ ↓ b) $s = s_0 + v_0 t + \frac{1}{2}at^2$	**Lecture/Chapter** 01: Kinematics **Topic**: Free fall CLO1:Test your knowledge of kinematics, dynamics, and laws of conservation of a mechanical system CLO3: Test your skills of analyzing and solving problems in science and engineering CLO4: Test your communication skills in writing manner
Q2. (20 marks) (a) (10 marks)  (b) (10 marks) $v_{CT} = \sqrt{70^2 + 80^2} = 106\,km/h$	**Lecture/Chapter** 01: Kinematics **Topic**: Relative motions CLO1:Test your knowledge of kinematics, dynamics, and laws of conservation of a mechanical system CLO2: Test your knowledge of applying physics to solving problems in science and engineering CLO3: Test your skills of analyzing and solving problems in science and engineering CLO4: Test your communication skills in writing manner
Q3. (20 marks) (a) (15 marks) $a = \frac{12}{1+2+3} = 2\,m/s^2$ (b) (5 marks) $F - P = m_1 a = 1 \times 2 = 2\,N$; $P = 10\,N$ $a = \frac{\Delta v}{\Delta t}$	**Lecture/Chapter** 02: Laws of motion **Topic**: Newton's second law CLO1:Test your knowledge of kinematics, dynamics, and laws of conservation of a mechanical system CLO2: Test your knowledge of applying physics to solving problems in science and

	engineering CLO3: Test your skills of analyzing and solving problems in science and engineering CLO4: Test your communication skills in writing manner
Q4. (20 marks) (a) (5 marks) $f_{st\,max} = \mu_{st}.N = \mu_{st}.mg = 0.5\times 2\times 9.8 = 9.8$ N ; (b) (15 marks) F > f_{stmax} : Object moves. $f_k = \mu_k N = \mu_k mg = 0.3\times 2\times 9.8 = 5.9$ N	**Lecture/Chapter** 02: Laws of motion **Topic**: Friction CLO1:Test your knowledge of kinematics, dynamics, and laws of conservation of a mechanical system CLO2: Test your knowledge of applying physics to solving problems in science and engineering CLO3: Test your skills of analyzing and solving problems in science and engineering CLO4: Test your communication skills in writing manner
Q5. (20 marks) (10 marks) $T = m\dfrac{v^2}{R}$ (10 marks) $m = \dfrac{4\times 1.0}{5^2} = 0.16$ kg	**Lecture/Chapter** 02: Laws of motion **Topic**: Newton's second law; uniform circular motion CLO1:Test your knowledge of kinematics, dynamics, and laws of conservation of a mechanical system CLO3: Test your skills of analyzing and solving problems in science and engineering CLO4: Test your communication skills in writing manner