

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

**School of Basic Sciences**  
**Bachelor of Science Honours in Physics**  
**Mid Term Examination - Nov 2023**

**Duration : 90 Minutes**  
**Max Marks : 50**

**Sem I - C1UD102B - Mechanics**

General Instructions

*Answer to the specific question asked*

*Draw neat, labelled diagrams wherever necessary*

*Approved data hand books are allowed subject to verification by the Invigilator*

- 1) What is meant by a centre of mass frame of reference? K2 (2)
- 2) Two bodies of different masses are moving with same kinetic energy of translation. Which has greater momentum? K1 (3)
- 3) A torque of 1 N-m is applied to a wheel of mass 10kg and radius of gyration 50cm. What is the resulting acceleration? K2 (4)
- 4) Show that Newton's first law of motion is only special case of second law K2 (6)
- 5) Establish that time rate change of angular momentum of a particle is equal to the torque acting on it. K3 (6)
- 6) If no torque acts on a body will its angular velocity remain conserved? K3 (9)
- 7) Examine and prove work-energy theorem. K4 (8)
- 8) What is a rocket? Why rockets are necessary? Establish the rocket relation with velocity. K4 (12)

**OR**

Analyze that the work done around a closed path is zero if force is conservative. K4 (12)