Dynamics – 2020 Nov AS Physics

1. Nov/2020/Paper_12/No.8

What is **not** a statement of one of Newton's laws of motion?

A If body X exerts a force on body Y, body Y exerts an equal and opposite force on body X. ✓

B If no resultant force acts on a body it has constant velocity. ✓

C The rate of change of momentum of a body is proportional to the resultant force acting on it and takes place in the direction of the force. ✓

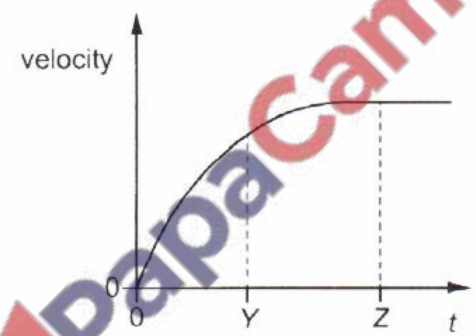
(D) The total momentum of a system of interacting bodies is constant if there is no external force. ×

'D' is the principle of conservation of momentum but not Newton's Laws.

2. Nov/2020/Paper_12/No.9

An object falls from a tall building.

The graph shows how the velocity of the object changes with time t.



The acceleration of free fall is g.

What describes the acceleration of the object at times $t = Y$ and $t = Z$?

	acceleration at $t = Y$	acceleration at $t = Z$
A ✓	decreasing	g
(B)	decreasing	0
C	constant	g
D	constant	0

acc is decreasing from Y to zero at Z

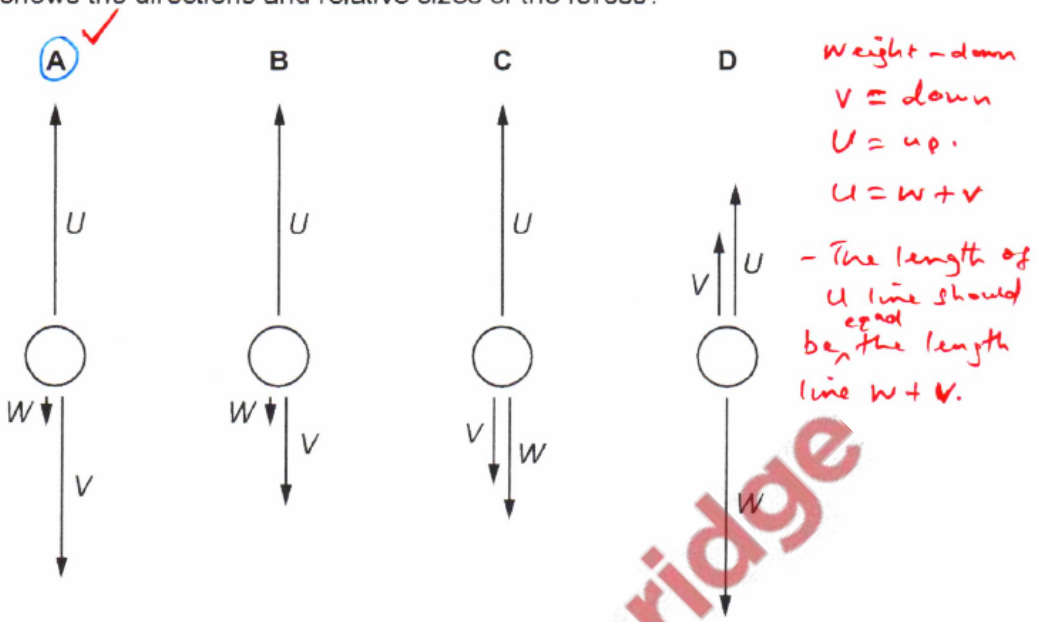
- At Z the object is at terminal velocity when weight = air resistance.

3. Nov/2020/Paper_13/No.11

An air bubble is rising through a liquid at a constant speed. The forces on it are the upthrust U, the viscous drag V and its weight W.

↑ means upward force = downward force.

Which diagram shows the directions and relative sizes of the forces?



Weight - down
V = down
U = up.
U = W + V
- The length of U line should equal be the length line W + V.