1. A constant net force acts on an object. Describe the motion.

(A) constant non-zero velocity. (B) constant non-zero acceleration.

(C) increasing acceleration. (D) decreasing acceleration.

(E) zero acceleration.

Newton's 2nd law: F=ma → constant F means constant a → **Correct answer is B**

2. A truck tows a car whose mass is ¼ that of the truck. The force exerted by the truck on the car is 6000 N. The force by the car on the truck is

(A) 1500 N. (B) 24000 N. (C) 3000 N. (D) 6000 N. (E) 12000 N.

Newton's 3rd law: equal and opposite force → **Correct answer is D**

3. A block of mass M slides down a frictionless plane inclined at an angle θ with the horizontal. The normal reaction force exerted by the plane on the block is

(A)Mg (B)Mg sinθ (C)Mg cosθ (D)Mg tanθ (E)zero, since plane is frictionless.

Correct answer is C (see example 5.9 in the book)

4. A 777 aircraft has a mass of 300,000 kg. At a certain instant during its landing, its speed is 27.0 m/s. If the braking force is 445,000 N, what is the speed of the airplane 10.0 s later?

(A) 10.0 m/s (B) 12.2 m/s (C) 14.0 m/s (D) 18.0 m/s (E) 20.0 m/s

$F = ma \rightarrow a=F/m$

Take positive x in direction of motion, so $a=-F/m$ and v_0 is positive

$V = v_0 + at = v_0 - Ft/m = 27 \text{ m/s} - 445{,}000*10/300{,}000 \text{ m/s}$

$V = 12.2 \text{ m/s} \rightarrow$ **Correct answer is B**

5. A force of 120 N is applied to an object of mass 30 kg. Its acceleration is

(A) 3600 m/s^2. (B) 150 m/s^2. (C) 4.0 m/s^2 (D) 2.0 m/s^2. (E) 0.25 m/s^2.

$F=ma \rightarrow a=F/m=120/30 \text{ m/s}^2 = 4 \text{ m/s}^2 \rightarrow$ **Correct answer is C**