TEST PAPER: PHYSICS

Time: 45 Minutes **Class: 9th C.B.S.E.**

Max. Marks: 30 Marks **Date: 27th June, 2018**

Marking Scheme: *Three questions carry 10 marks each. Each question has 3 subparts each. Subparts A and B carry 3 marks each and subpart C carries 4 marks.*

Question 1:

A. Choose the correct option:

i) Which of the following statement is not correct for an object moving along a straight path in an accelerated motion
   a) Its speed keeps changing
   b) b) its velocity always changes
   c) c) It always goes away from earth
   d) d) A force is always acting on it

ii) According to the third law of motion action and reaction
   a) always act on same body
   b) b) always act on different bodies in opposite directions
   c) c) have same magnitude and directions
   d) d) act on either body at normal to each other

iii) An object of mass 2 kg is sliding with a constant velocity of 4m/s on a frictionless horizontal table. The force required to keep the object moving with the same velocity is
   a) 32N
   b) b) 0N
   c) c) 2N
   d) d) 8N

B. Fill in the blanks:

i) Two cars having masses in the ratio 4 : 5, accelerate in the ratio 2:3. Find the ratio of forces exerted by each of them.

ii) There are three solids made up of aluminium, steel and wood of same shape and same volume. Which of them would have highest inertia? Also give the factor on which inertia depends. (Hint: Steel is denser than aluminium)

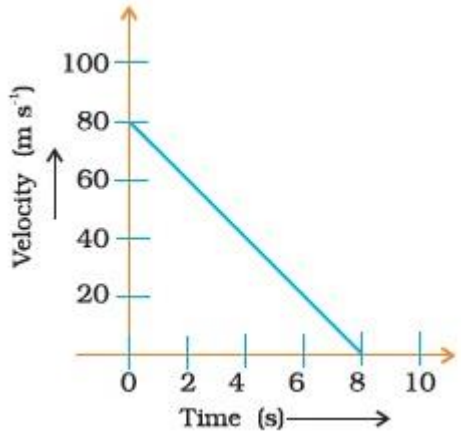
iii) State Newton's first law of motion. Why do you fall in the forward direction when a moving bus brakes to a stop?

C. Answer the following in brief:

State Newton's second law of motion. Derive mathematical formulation of second law of motion.

Question 2:

A. Answer the following:



Velocity versus time graph of a ball of mass 50g rolling on a concrete floor is shown. Calculate the acceleration and frictional force of the floor on the ball.

B. Answer the following:

i) What is momentum? Give its SI unit. Is it a vector or scalar quantity?
ii) What is inertia?
iii) Prove Newton's first law of motion using mathematical expression of second law of motion.

C. Answer the following:

i) What is law of conservation of momentum? Prove total momentum of two objects is not changed or conserved by collision.

Question 3:

A. Answer the following:

i) Which would require a greater force accelerating a 2 kg mass at $5m/s^2$ or a 4kg mass at $2m/s^2$?
ii) Describe two examples of inertia due to motion.

B. Answer in brief:

i) Write three equations of motion with proper abbreviation used and its SI unit.
ii) Which law of Newton is illustrated when a sailor jumps in a forward direction out of a rowing boat?
iii) Newton's first law of motion is also called as law of _____

C. Answer the below questions:

i) A bullet of mass 10g travelling horizontally with a velocity of 150 m/s strikes a stationary wooden block and comes to rest in 0.03s. Calculate the distance of penetration of the bullet into the block. Also calculate the magnitude of the force exerted by the wooden block on the bullet.

ii) Why action and reaction forces don't produce accelerations of equal magnitudes?