**Motion Revision for Topic Test**

1. *Distance is the length of the pathway taken and is a scalar,*

*Displacement is the length of the line joining the starting point to the finishing point and the direction the line is pointing.*

1. *Vectors are quantities that have magnitude and direction, scalars are quantities that have magnitude only.*
2. Find the distance and displacement of:
3. *Distance = 10m, displacement = 2m right*
4. *Distance = 5km Displ. Diagram: 3.61km S 33.70W*
5. *Speed is the rate of change in distance and is a scalar.*

*Velocity is the rate of change in displacement and is a vector.*

1. a) 5.77 m/s b) 0
2. a) *35.4m b) 2.4m N 35.4 m N c) speed = 6.94 m/s d) v= 0.47 m/s N*

*e) Abs U (l) = 0.025m Abs U (t) = 0.01 s 5U (l) = 0.025/16.5 x 100 =0.152% and 0.132%*

*% U 9t) = 0.01/2x100 = 0.5% and 0.323 %*

1. *6.67 m/s*
2. *9m*
3. *3.45 s*
4. *Acceleration is the rate of change in the velocity of an object. A = v-u/t ms-2*
5. *A = 16.67/60= 0.27ms-2*
6. *t = v-u/a = (20-10)/2.5 = 4 s*
7. How far would a parachutist fall in the first 3.5 seconds? (a = 9.8ms-2, u = 0ms-1) NOT FOR GENERAL 60.0 m
8. What is deceleration? *Occurs when an object slows down.*
9. *a = 0-8/10 = - 0.8 ms-2 = deceleration of 0.8 ms-2*
10. *v = u + at = 60 + -8x5 = 20 m/s in forward direction*
11. How far does an object travel if it starts at 6ms-1 and accelerates at a constant rate of 2ms-2 for 9 seconds? NOT FOR GENERAL *135m*
12. a) *A = (273-31)/3.51 = 68.9 ms-2 in forward direction. B) s = 31 x 3.51 + 0.5 x 68.9 x 3.512 = 533 m*
13. How long does it take a car to cover 90m from the traffic lights if it accelerates at 5 ms-2?

S= ut + ½ at2 90 = ½ x 5 x t2 t = 6 s

1. Draw a ticker tape that shows:
2. constant velocity followed by rapid deceleration
3. rapid acceleration followed by slow deceleration.
4. Two timer tapes were analysed and the following information was recorded:

Tape Intervals (spaces on tape) Length

1 5 34 mm

2 12 50 mm

1. *0.1 s and 0.24s b) 0.34 m/s 0.208 m/s c) Abs U = 0.5 mm % U = 1.47% and 1%*
2. *Force is a push or pull. Newtons*
3. *Change in speed, change in direction, change in shape, cause of motion*
4. *His hand on the baseball, the baseball, acceleration into the air.*
5. *Mass is the amount of matter in an object, weight is the gravitational force of attraction to the centre of the earth. Mass is measured in kg and weight in Newtons.*
6. *W = 45 x 9.8 = 441 N*
7. *M = 650/9.8 = 66.3kg*
8. State Newton's three Laws of Motion.

*NI: A body continues in a state of rest or constant velocity unless acted on by an unbalanced force.*

*NII : A body will accelerate in the direction of an unbalanced force that is applied to it.*

*NIII: For every action force ther is an equal and opposite reaction force.*

1. *F = 1 000 x 5 = 5 000N in forward direction*
2. *a= 900/80 = 11.25 ms-2*
3. *m= 300/2 = 150 kg*
4. *a = 200/100 = 2 ms-2 t = (v-u)/a =(5 -0)/2 = 2.5s*
5. *a = (v-u)/t = (10-0)/5 = 2 ms-2 m = F/a = 30/2 15kg*
6. Explain why:
7. Eggs fly off the back seat when you stop suddenly
8. You fall out of your seat as a bus takes the corner.
9. You slip when you walk on a banana peel.
10. When John jumped off a boat for the jetty he fell in the water.
11. A gun experiences recoil.
12. *NI law: the objects will continue at that velocity as there is force acting on them to stop their motion unlike the car where the brakes are applying an unbalanced force on the car causing it to stop.*
13. *NI law your body continues on at a constant speed in a straight line while the bus changes direction.*
14. *NIII law Your foot applies a force on the banana, but the banana is slippery so it cannot apply the reaction force back on you due to lack of friction therefore your foot slides backwards.*
15. *NIII John applies a action force against the boat but because the boat is accelerated backwards (NII law) it doesn’t supply an equal reaction force on John to accelerate him to jetty.*
16. *NIII law When explosion occurs there is a force applied on bullet and equal and opposite force on to gun causing recoil.*
17. *Seat belt – applies a force on body and will cause the body to change motion with the car. Otherwise NI happens body continues on at constant speed into windscreen.*

*Crumble zone – when hitting an object head on the force applied to the car and bringing it to a stop happens over a longer time. So the force on the body inside is reduced.cushioning effect.*

*Head rest NI law – when struck from behind applies a force to head to move it with car otherwise gets left behind as it remains stationary.*