SCIENCE

Q.11- One atomic mass unit is a mass unit equal to exactly one twelfth (1/12th) the mass of one atom of _____

Correct Response-3945/5420=72.8%

Ans- (a) Carbon-12

Explanation- Carbon-12 isotope is the standard reference used for measuring atomic masses of various elements.

Q.12- A particle M has 18 electrons, 20 neutrons and 19 protons. This particle must be a:

Correct Response-1853/5416=34.2%

Ans- (b) Cation

Explanation- Potassium K+
Because the particle P has 19 protons, this means that its atomic number is 19 and hence it is a potassium particle. It has 18 electrons means it has lost an electron, therefore it is a positive ion.

Q.13- NaCl molecule is made of which of the following ions?

Correct Response-2972/5399=55.04%

Ans – (a) Na cation and Cl anion

Explanation- Sodium chloride, also known as salt, common salt, table salt or halite, is an ionic compound with the chemical formula NaCl, representing a 1:1 ratio of sodium and chloride ions.

Q.14- What is the atomic mass of nitrogen?

Correct Response-3426/5443=62.94%

Ans (d) 14 a.m.u

Explanation- Nitrogen has an atomic number and mass number 14. So, the atomic mass is 14 u.

Q.15- A box contains some identical red colour balls labelled as A each weighing 2 g. Another box contains identical blue coloured balls, labelled as B, each weighing 5 g. In the combinations AB, AB2, A2B and A2B3 which is applicable?

Correct Response-2504/5413= 46.26%

Ans- (b) Law of multiple proportion

Q.16- Which of the following situations is true and possible-

Correct Response-1753/5413= 32.38%

If the velocity of a body is zero, then the acceleration can be non-zero

A body moving at a constant velocity can have acceleration

The magnitude of distance and displacement are equal in a circular motion

Ans (d) All the above

Q.17- Suppose a boy is moving with a uniform velocity of 10 m/s on a merry-go-round ride. Which of the following is true of the given scenario?

Correct Response-2516/5417=46.45%

Ans- (c) The boy is moving with accelerated motion

Explanation- Speed of an object is a scalar quantity. It only has magnitudes but no direction. But velocity of an object is a vector quantity. It has both direction and magnitude.

In a merry-go-round, the objects move in a circular path around a round platform. As an object moves in a merry-go-round, the speed of the object may be constant, but the direction of the object changes with the motion of the object. Velocity of an object changes with the changes in speed or direction or both. Since, in a merry go round, even if the speed of the object is constant, the direction of motion of the object changes and the object will accelerate as, acceleration can be defined as the rate of change of velocity of the object.

We are given that a boy is enjoying a ride on a merry-go-round with a constant speed. According to the concept of velocity, the boy will be in an accelerated motion.

Q.18- The physical quantity that has both magnitude and direction is known as

Correct Response-3736/5441=68.66%

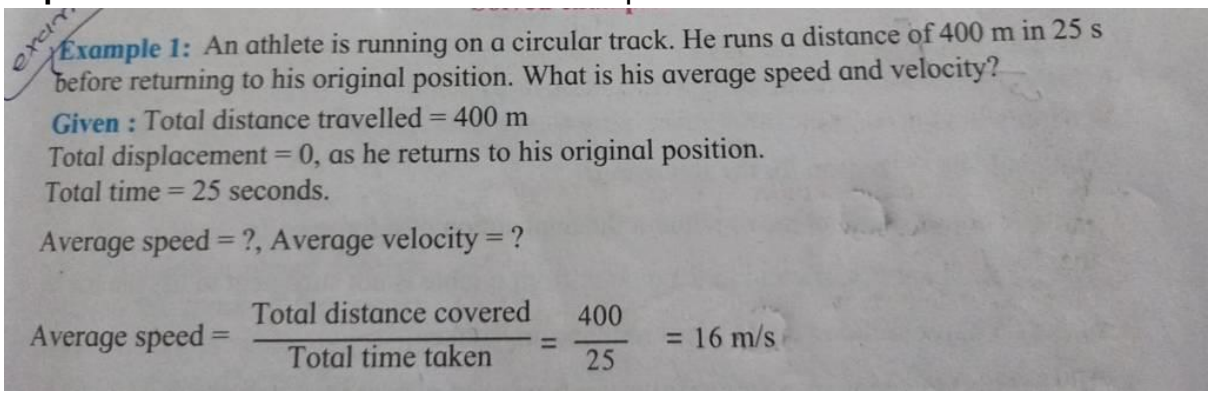
Ans -(b) Vectors

Q.19- An athlete is running on a circular track. He runs a distance of 800 m in 5 s. what is his average speed and velocity ?

Correct Response-2949/5397=54.64%

Ans- (a) 16 m/s and 0 m/s

Explanation- Solution same as the similar question mentioned below



Example 1: An athlete is running on a circular track. He runs a distance of 400 m in 25 s before returning to his original position. What is his average speed and velocity?

Given : Total distance travelled = 400 m

Total displacement = 0, as he returns to his original position.

Total time = 25 seconds.

Average speed = ?, Average velocity = ?

$$\text{Average speed} = \frac{\text{Total distance covered}}{\text{Total time taken}} = \frac{400}{25} = 16 \text{ m/s}$$

Q.20- If the displacement of an object is proportional to square of time, then the object moves with

Correct Response-3058/5420=56.42%

Ans – (a) Uniform acceleration

Explanation-

If the displacement of an object is proportional to the square of the time taken then the body is moving with uniformly accelerated motion as it will follow Newton's second equation of motion for a particular initial velocity, which can be given by, s = u t + 1/2 a t 2 .