Name of the Student:_____
Max. Marks : 13 Marks **Time : 13 Minutes**

Q1.

Figure 5 shows a current-carrying wire between the poles of a magnet.

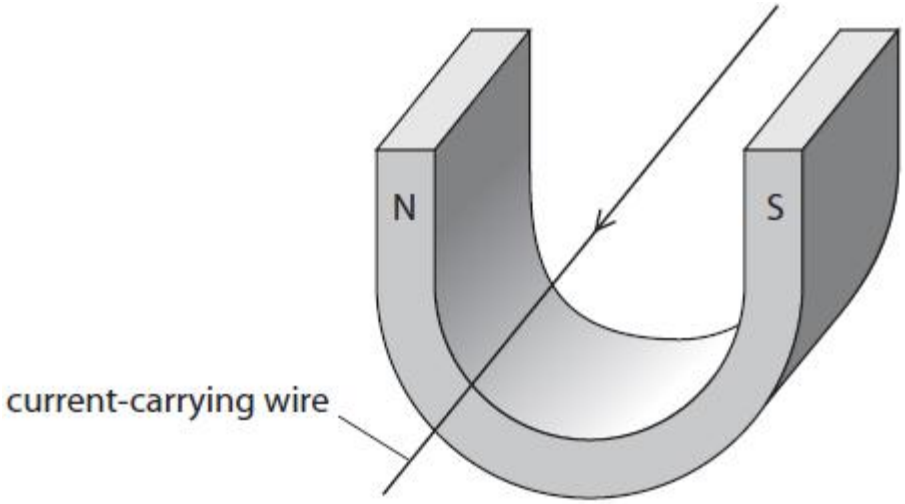


Figure 5

(i) The magnet and the wire each experience a force when there is a current in the wire.

(2)

1 State the direction of the force on the wire.

.....

2 State the direction of the force on the magnet.

.....

(ii) The force on the wire is 0.15 N.

The current in the wire is 2.7 A.
The magnet produces a field with a magnetic flux density of 0.50 T.
Calculate the length of the wire in the magnetic field.
Use an equation selected from the list of equations provided.

(2)

length of the wire in the magnetic field = ... m

(Total for question = 4 marks)

Q2.

A student investigates moments of forces.

Figure 14 shows the apparatus used.

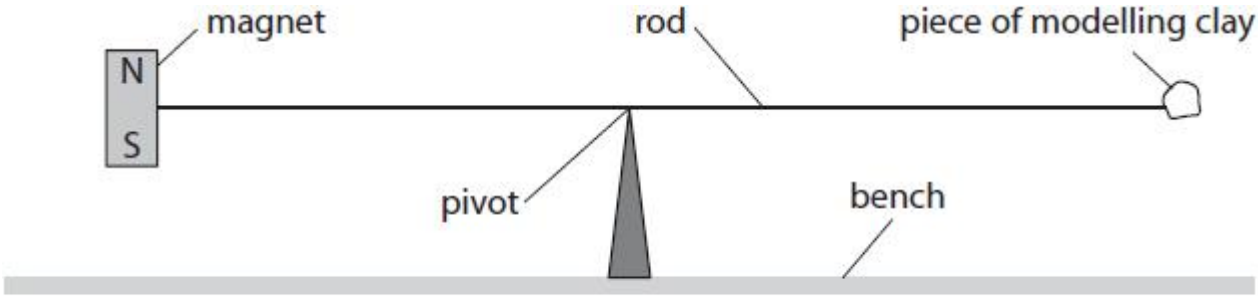


Figure 14

The pivot is under the centre of the rod.

A magnet is fixed to one end of the rod.

A piece of modelling clay is fixed to the other end of the rod.

The system is in equilibrium.

State the relationship between the moment of the weight of the magnet and the moment of the weight of the piece of modelling clay about the pivot.

(1)

.....

.....

(Total for question = 1 mark)

Q3.

A student has a bar magnet, a piece of iron the same size as the magnet, and some paper clips.

Describe how the student could use these items to demonstrate temporary induced magnetism.

(3)

.....

.....

.....

.....

.....

.....

(Total for question = 3 marks)

Q4.

A student has a bar magnet, a piece of iron the same size as the magnet, and some paper clips.

Describe how the student could use these items to demonstrate temporary induced magnetism.

(3)

.....

.....

.....

.....

.....

.....

(Total for question = 3 marks)

Q5.

Wooden trucks on a toy railway have permanent magnets that hold the train together.

The magnets are arranged so that an N-pole touches an S-pole between each truck, as shown in Figure 15.

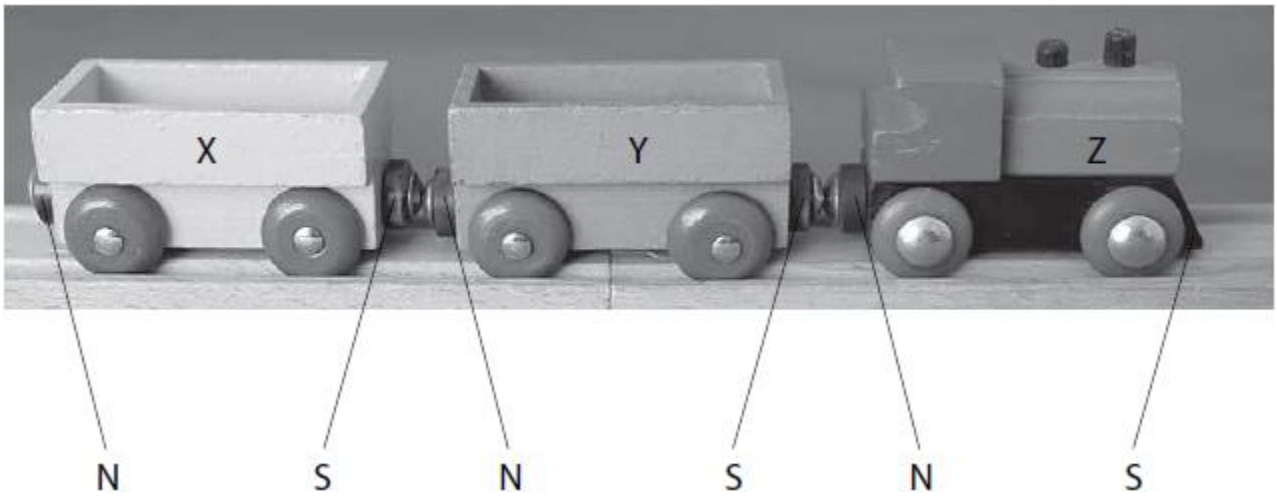


Figure 15

(a) Truck Y is removed from the train, turned through 180° and is then replaced between truck X and Z.

How does this affect the train?

(1)

- ☒ **A** Y attracts both X and Z as before
- ☒ **B** Y still attracts X but now repels Z
- ☒ **C** Y still attracts Z but now repels X
- ☒ **D** Y now repels both X and Z

(b) The structure of a truck, seen from above, is shown in Figure 16.

The permanent magnets cause a magnetic field both inside and outside the truck.

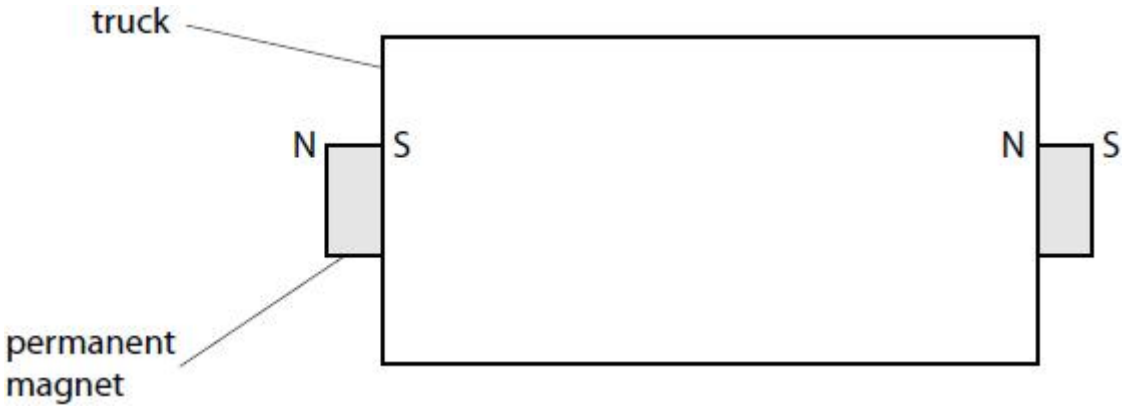
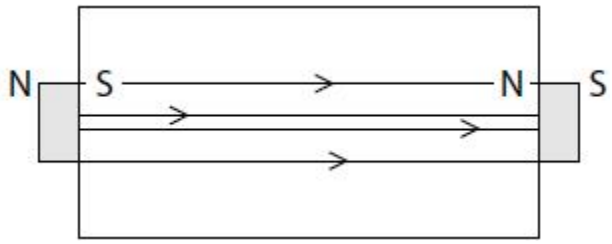


Figure 16

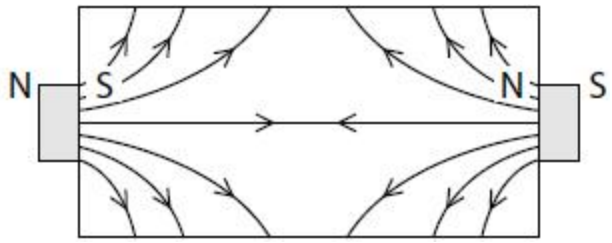
Which of these correctly shows the field inside the truck?

(1)

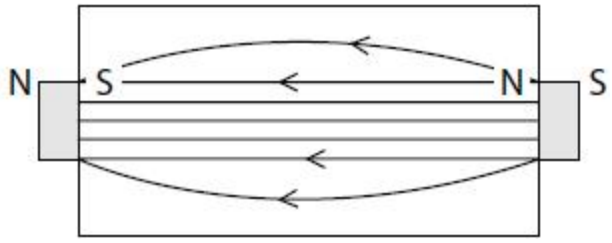
☐ **A**



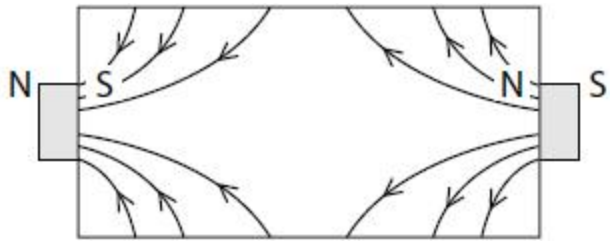
☐ **B**



☐ **C**



☐ **D**



(Total for question = 2 marks)