

Name of the Student: _____

Max. Marks : 21 Marks

Time : 21 Minutes

Q1.

The Sun is the closest star to the Earth.

- (a) A 2.5 kg mass would have a weight of 750 N at the surface of the Sun.

Calculate the gravitational field strength at the surface of the Sun.

Use the equation:

$$\text{gravitational field strength} = \frac{\text{weight}}{\text{mass}}$$

Gravitational field strength = _____ N/kg

(2)

- (b) Gravity is a non-contact force.

Which of the following is also a non-contact force?

Tick (✓) **one** box.

Air resistance

☐

Electrostatic

☐

Friction

☐

Tension

☐

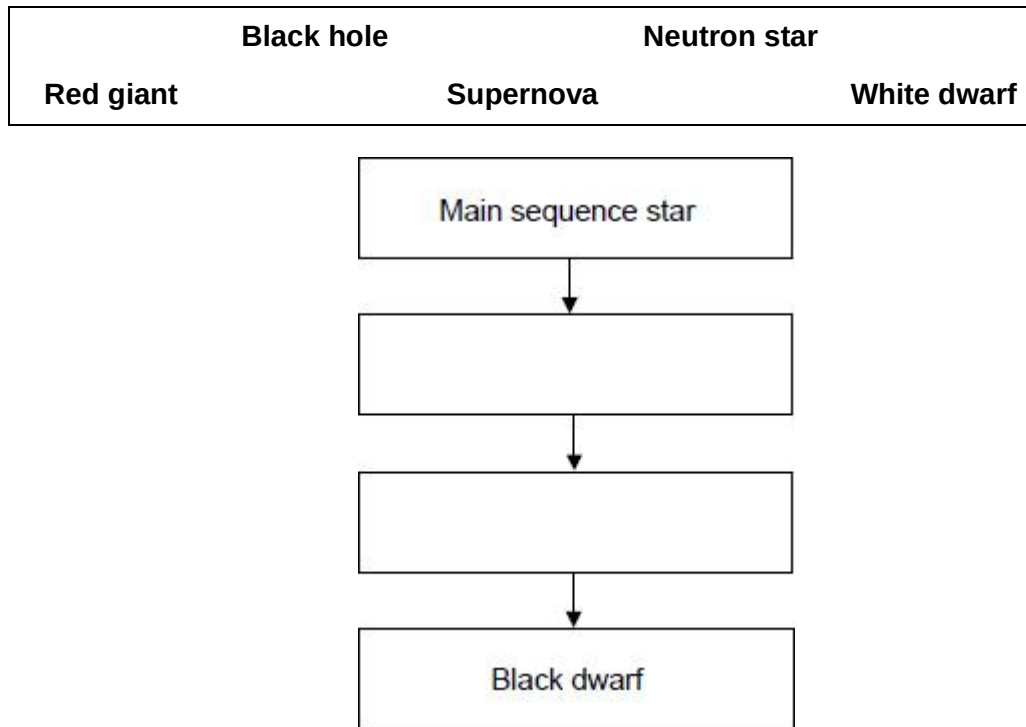
(1)

- (c) All stars have a life cycle.

The figure below shows part of the life cycle of a star that becomes a black dwarf.

Complete the figure below.

Choose answers from the box.



(2)

The table below gives the mass of three stars compared to the mass of the Sun.

Star	Mass compared to the mass of the Sun
X	$\times 25.0$
Y	$\times 15.0$
Z	$\times 0.9$

(d) Which letter represents the star most likely to become a black dwarf?

Give a reason for your answer.

Tick (✓) **one** box.

X ☐ Y ☐ Z ☐

Reason _____

(2)

(e) In which stage of the life cycle of a star are elements heavier than iron produced?

Tick (✓) **one** box.

Nebula

☐

Protostar

☐

Supernova

☐

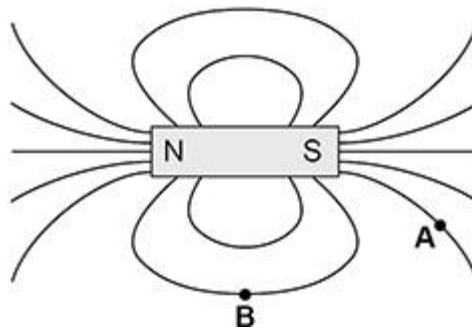
(1)

(Total 8 marks)

Q2.

Figure 1 shows the magnetic field pattern around a bar magnet.

Figure 1



- (a) Draw an arrow at point **A** and point **B** to show the direction of the magnetic field at each point.

(1)

- (b) A bar magnet produces its own magnetic field.

Complete the sentence.

Choose the answer from the box.

an electromagnet an induced magnet a permanent magnet

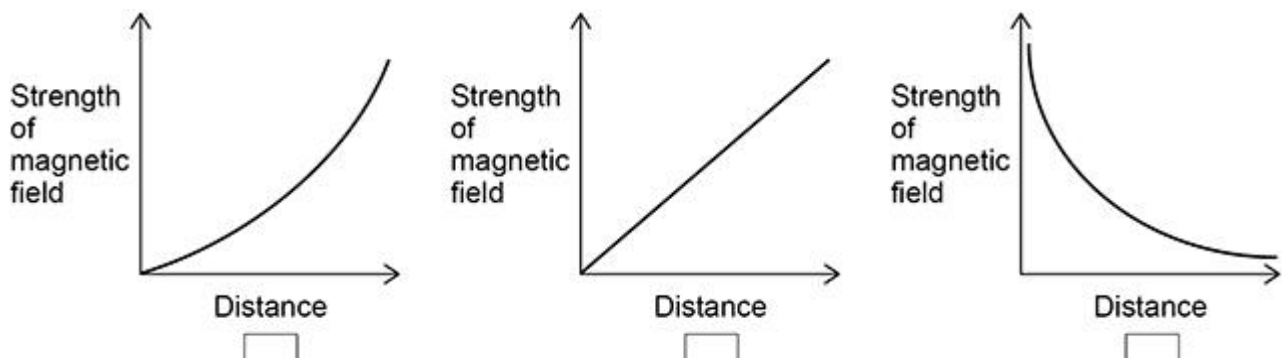
A bar magnet is an example of _____.

(1)

- (c) Which graph shows how the strength of the magnetic field varies with distance from the bar magnet?

Give a reason for your answer.

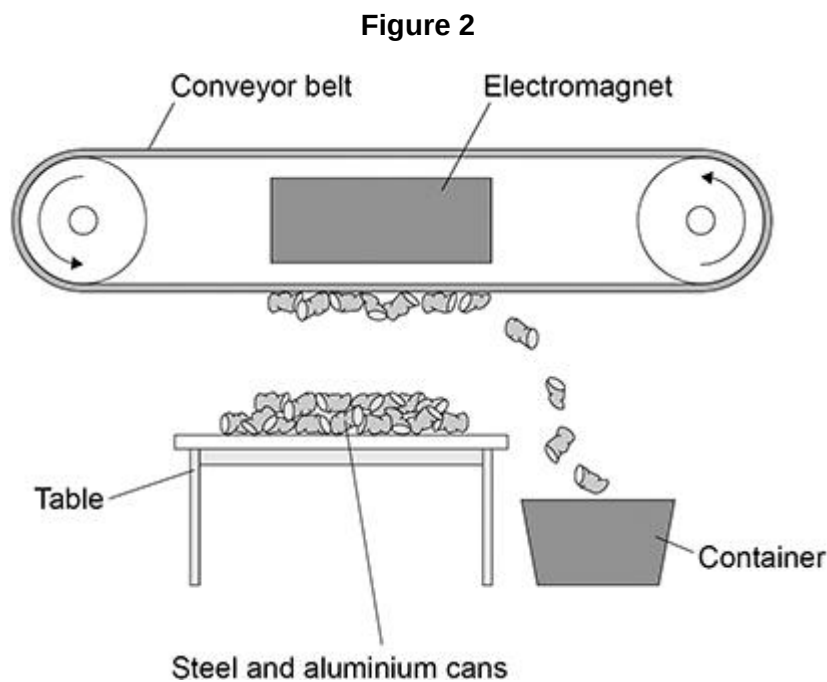
Tick (✓) **one** box.



Reason _____

(2)

Figure 2 shows an electromagnet being used to separate aluminium cans from steel cans.



- (d) Explain how the electromagnet and conveyor belt are used to separate the steel cans from the aluminium cans.

(2)

- (e) At the top of the table the strength of the magnetic field is only just enough to pick the cans up. Describe **two** ways to increase the strength of magnetic field at the top of the table.

1 _____

2 _____

(2)

- (f) Write down the equation which links distance travelled (s), speed (v) and time (t).

(1)

- (g) The conveyor belt moves a can at a speed of 1.7 m/s .

Calculate the time taken to move the can 3.3 m at this speed.

Give your answer to 2 significant figures.

Time taken (2 significant figures) = _____ s

(4)

(Total 13 marks)