



Subject: Grade 8 Technology

Topic: Technology: Term 2 - Exam 1

Total: 113 Marks

1. marine

3 marks

Explanation:

Marine life is most affected by all the **plastic pollution in the oceans**. Storm water drains which run into the sea often carry waste plastic. People also litter on and near the beach and this ends up in the ocean as well.

2. South Africa | England | Germany

6 marks

Explanation:

The article discusses how much general waste in each country ends up in landfills instead of being recycled:

- South Africa 90%
- Germany 20%
- France 37%
- England 60%

3. land | leach | environmental

6 marks

Explanation:

The article states that the excess (too many) of landfill spaces is becoming a major problem. **Landfill spaces use up valuable urban land** which can be used for housing.

Landfills pose a great **health and environmental risk** as the **chemical compounds are leaching (leaking or soaking) into soil and groundwater**. These compounds can then affect the health of people and nature.

4. D: Columns are compressed by the load they carry.

4 marks

Explanation:

Columns can be **horizontal or vertical pillars**. They are **compressed** by the load they carry. They **cannot resist against a tension force**. Columns are the **most common element in structures** and are very common in the construction industry.



5. 0,5 | half | 1/2

3 marks

Explanation:

$$MA = \frac{\text{Load}}{\text{Effort}}$$

$$MA = \frac{200N}{400N}$$

MA = 1/2 or 0,5

In this system the mechanical advantage is <1 and the input (effort) is greater than the output (load).

6. A: The small wheel forms a groove to guide the cable or rope of the pulley system.

4 marks

Explanation:

Pulley wheels are grooved wheels that guide cables and prevent them from slipping off. The small wheel situated in the middle creates a groove, with two larger wheels on either side to support it.

7. A: first class

4 marks

Explanation:

Pliers are first class linked levers.

- Two first class levers are joined at the fulcrum.
 - The fulcrum is in the middle.
-

8. fracture | fracture.

3 marks

Explanation:

A **fracture** is when part of a structure is **fatigued** from carrying a load or from the forces acting on it and it **tears apart**. It is for this reason that **maintenance** must be done on buildings and structures over time - to repair and reinforce structures in order to prevent collapse.

9. section | angle | cross

6 marks

Explanation:

This image shows an example of a **metal section**.

This L shape is called an **angle iron** and is used for **cross bracing** and triangulation in large structures.

There are other types of metal sections such as **I-beams or T-bars**.

These metal sections save costs as they are **not solid**, yet are still very strong to withstand forces.

10. isometric

3 marks

Explanation:

Isometric projection is drawn at an angle of **30 degrees**. The lines are drawn vertically upwards and the horizontal sides of a structure are not drawn at right angles to the vertical lines, but at 30 degrees to the horizontal lines.

11. true

2 marks

Explanation:

All machines developed through history are based on the **six simple machines**. These machines have been combined and further developed to create complex machinery. We use these 6 simple machines every day: **the wheel, the pulley, the wedge, the lever, the screw and the inclined plane**.

12. king post | king post.

3 marks

Explanation:

The long vertical **central post** supporting the rafters is called a **king post**. A queen post is one of two posts. They are found between a principal rafter and the roof truss.

13. tie-beam | strut | rafter

6 marks

Explanation:

- In this roof truss, part **A is a tie-beam**, which is a **horizontal** beam and is in **tension**.
 - Part **E is a strut** between the tie-beam and the rafter and is always in **compression**.
 - Part **F is a rafter** which **carries the tiles** and roof sheets, and is at an **angle**.
-

14. upgraded | outdated | discarded

6 marks

Explanation:

Modern technological devices are continually being **replaced with new upgraded and updated models**. The previous models or versions are **outdated and are then thrown away** or discarded, which causes more items ending up in landfills.

15. true

2 marks

Explanation:

Using technology and devices can cause health problems. "Apart from creating unhealthy sleeping patterns, electronic devices can cause digital eye strain, poor posture, and **increased inactivity, leading to health problems like obesity**."

Because people sit around too much using technological devices and not doing any physical activity, this can lead to being overweight or obese.

16. true

2 marks

Explanation:

The **negative impact** of technology in society is a **direct result of the way we use technology**. If we use technology in a **disciplined and healthy way, it has a positive impact** on society and our daily lives.

We need to ensure that we **manage** the ways in which we use technology and how we dispose of used technological products. We should always "reduce, reuse and recycle" products.

17. 3:1 | 3 to 1 | 3 to 1.

3 marks

Explanation:

Gear ratio = $\frac{\text{the number of teeth on the driven gear}}{\text{the number of teeth on the driver gear}}$
= 90 / 30
= 3 / 1

Therefore the **ratio is 3: 1**

So every time the driver gear rotates 3 times the driven gear will rotate once.

18. global

3 marks

Explanation:

Greenhouse gases contribute to **global warming**. Many technological advances and improvements have been made to try and **reduce the carbon emissions from factories**. Through recycling we can also reduce the methane gas emissions from landfills.

19. C: The reason why materials used in large structures must be reinforced, is that there are static and dynamic forces acting on the structures.

4 marks

Explanation:

- The reason why materials used in large structures must be reinforced is that there are **static and dynamic forces acting on the structures**. These forces cause **structural failure**. To prevent fractures and bending or toppling large structures are reinforced.
 - Concrete is reinforced with **metal rebars** to make it last longer.
 - Structures are reinforced to ensure they do not fail. Aesthetics will only be considered once a **safe, strong structure** has been designed.
 - The **number of layers glued together in a plywood** panel depends on the required **purpose** of the plywood.
-

20. false

2 marks

Explanation:

The presentation of the mine headgear project must be done during the **communication** stage of the design process. The project idea is explained to other people.

21. structure | load | wind

6 marks

Explanation:

An engineer designing a structure must consider three important things to prevent structural failure. The first is the **weight of the structure itself**; including the materials used to build it. The second is the weight of **the load the structure will carry such as traffic or people**. The third one is the force of the **wind passing through the area**. The rain will not be a factor unless it is a **windy** storm.

22. spur | spur.

3 marks

Explanation:

Spur gears are two gears **meshed** together. The teeth of the gears interlock.

23. bending | bending.

3 marks

Explanation:

Shelves have to **resist a bending force** from the heavy load. If they are made from a **reinforced material like plywood** then they won't bend and dip in the centre.

24. true

2 marks

Explanation:

This is a beam and column bridge. These are the **columns** of the bridge and the **beam** rests on top of the columns. This is the most simple type of bridge to construct.

25. reuse | recycle | reduce

6 marks

Explanation:

- **Reuse:** Thin plastic shopping bags tear easily and are usually not reused and end up being thrown away and taken to landfills. The thicker plastic bags can be reused many times.
 - **Recycle:** Plastic bags can be taken to a recycling plant where they are broken down into pellets to make new products.
 - **Reduce:** Instead of using plastic, the better option is to use either a paper bag which will decompose, or a long lasting bag made from material that can be reused. This reduces the amount of plastic bags being made and sold.
-

26. B: C and D

4 marks

Explanation:

The mining headgear tower carries the load and people in the cage and skip. These are labelled parts C and D.

27. triangulation | strengthen

4 marks

Explanation:

Pylons need to be **strengthened** to withstand the forces of strong weather conditions, like wind, rain and even earthquakes. To strengthen pylons, the basic design uses **triangulation and cross-bracing**. The electrical pylon can be very tall due to this support.

28. D: 3

4 marks

Explanation:

Use the formula **MA = $\frac{\text{Load}}{\text{Effort}}$**

$$\text{MA} = \frac{300\text{N}}{100\text{N}}$$

$$\text{MA} = 3$$

The mechanism makes it three times easier to do the work.

29. false

2 marks

Explanation:

This article discusses how **plastic can have a positive impact if it is used correctly and thoughtfully**.

The article does not ignore the fact that plastic can have a negative impact. However, technology has created ways where plastic has a more positive impact. For example, paragraph 1 discusses how plastic parts in cars make them lighter, which saves fuel.

30. D: is lighter to transport from a factory to the shops.

4 marks

Explanation:

Plastic is **lighter than glass**, so when it is used for packaging it is lighter for the trucks to transport the goods from the factory to the shops. This means that the **trucks use less fuel**.

The other answers are incorrect as plastic is **resistant to corrosion, does not decompose** and **filters UV rays** which keeps buildings cooler, so less air conditioning is needed.

Total: 113 Marks