



**Subject:** Grade 7 Technology

**Topic:** Technology: Term 1 - Mini-Exam

**Total:** 102 Marks

---

1. D: D] Move the rock with a pole used as a lever.

4 marks

**Explanation:**

The rock can be moved with a lever. A long bar is used to wedge between two rocks. A slight movement with the bar can shift the rock out of place. This will not cause any injury to a person.

---

2. syringe

3 marks

**Explanation:**

A syringe comprises three parts: a cylinder, piston, and nozzle. When the piston is pushed into the cylinder, air or water is forced into the nozzle. The piston on the second syringe will move outward if the nozzle is linked to another syringe.

---

3. spreader | hydraulic | levers | cautiously

8 marks

**Explanation:**

The spreader is the jaws of life tool used to push the crumpled metal pieces apart. The steering column can be moved with a spreader if it traps the driver in an accident.

A hydraulic system uses syringes and tubes containing liquid such as water for pressure. The system must be strong to withstand the water pressure.

The blades of the jaws of life will produce a high mechanical advantage with the help of levers to cut through the vehicle's steel frame.

Rescue workers must work cautiously because the jaws of life machines can be dangerous to operate. The machines must not injure the operator or the people being rescued.

---

4. C: Explaining how electrical control systems work.

4 marks

**Explanation:**

The Jaws of Life mini-pat will assess the inclusion of lever and hydraulic systems. The electrical system is not included in the project.



---

5. pressure | leak | pivots | cable ties

8 marks

**Explanation:**

To activate the jaws of life, the person operating the effort syringe must apply pressure on the piston handle to open the blades.

It's important to note that the jaws of life may not function properly if there is a leak in the syringes or tubes. Water or air will escape, and the pressure in the cylinder will fall.

Making the pivots for the jaws of life is feasible using small bolts and nuts. The bolts must not be tightened too much to prevent the blades from jamming.

Cable ties can be used to secure the syringes to the base of the jaws of life. These plastic straps are strong, and they can hold items firmly.

---

6. Second | 2nd

3 marks

**Explanation:**

A second-class lever has the load between the fulcrum and the effort, allowing for a mechanical advantage greater than one. This means a large load can be moved with a small effort.

---

7. water

3 marks

**Explanation:**

Water is used in syringes and tubes to form hydraulic systems. By pushing the plunger into the syringe cylinder, water pressure is generated. The output syringe activates the lever system that opens or closes the blades.

---

8. C: seesaw

4 marks

**Explanation:**

The load is far from the fulcrum on a seesaw. If the load is closer to the fulcrum, then it would not be easy to lift up the person sitting on the other side.

---

9. true

2 marks

**Explanation:**

In a first-class lever, the fulcrum is positioned in the centre, with the effort and load on opposite sides. The input force is the effort or work applied, while the output is the load's movement, cut, or lift.

---

10. B: A - Effort B - Load C - Fulcrum

4 marks

**Explanation:**

A second-class lever will have effort, load and fulcrum. The wheelbarrow is a second-class lever.

A - Effort B - Load C - Fulcrum

---

11. pivots | linked lever | load | effort

8 marks

**Explanation:**

The parts labelled "A" are the pivots, which will hold the parts together and help with movement. Pivots are bolts, nuts and screws.

The device is a linked lever system that has several levers connected. One lever moves the other levers.

The load will be held at point "C". The load is the food item being picked up.

The effort at point "B" is where the person will input work by holding and moving the handles. The handles must be gripped firmly.

---

12. true

2 marks

**Explanation:**

Using a long lever with the fulcrum close to the heavy object can help lift it. A soft downward push on one side of the lever creates a greater upward push on the other. A long pole can be used as a lever to move a big rock in the garden.

---

13. D: D - The stick is in between a small rock and a big rock.

4 marks

**Explanation:**

The stick is in between a small rock and a big rock. A lever works with a pivot, effort and load. The effort is pushing on the stick. The pivot is the small rock on which the stick will rest. The big rock is the load that the stick will move.

---

14. true

2 marks

**Explanation:**

The pneumatic system will use air in the syringes connected by pipes to create movement when the plunger is pushed. A hydraulic system will use water or oil instead of air to create the pressure.

---

15. effort

3 marks

**Explanation:**

The letter 'C' of the scissors is the **effort**.

---

16. hand | arm | fingers | forearm

3 marks

**Explanation:**

The human arm is an example of a third-class lever, where the elbow joint acts as the fulcrum, the biceps muscles provides the effort force, and the forearm acts as the lever arm.

---

17. false

2 marks

**Explanation:**

**Mechanical advantage:**

- To increase mechanical advantage, shorten the distance between the load and the fulcrum.
- Increase the length of the lever.
- A second-class lever, where the load is closer to the fulcrum, will have a higher mechanical advantage.

---

18. hydraulic | load | effort | lever

8 marks

**Explanation:**

The hydraulic system will be the part labelled A, which contains the fluid for movement. The fluid must not leak because the system will not work.

The part labelled D will work on the load removed from the damaged car. This will be pieces of metal.

The initial input in the system will be the effort activated in part E. The syringe piston is pushed or pulled.

The lever system in part B contains the pivots, load and effort. The hydraulics and levers make it a complex system.

---

19. evaluation | investigation | communication | design

8 marks

**Explanation:**

The **evaluation** stage will require testing the product to find faults before it is demonstrated to people. The product can be tested for strength, durability and quality of materials.

The project is explored and researched to discover designs, materials and tools during the **investigation**. People can search the internet for ideas.

At the **communication** stage, the project is presented to other people through media such as posters, videos, notes, and slides. People can ask questions about the project.

Existing and new product ideas are compared, and sketches are drawn in the **design** stage. Many designs can be explored, and the best one is chosen.

---

20. C: Third-class lever

4 marks

**Explanation:**

This is a third-class lever. The effort or work will always be in the middle of a third-class lever.

A - Load B - Effort C - Fulcrum

---

21. mechanical

3 marks

**Explanation:**

Machines increase force to make tasks easier, known as mechanical advantage. Machines help people, and it makes our lives easier.

---

22. false

2 marks

**Explanation:**

A broom and braai tongs are classified as **third-class levers**. The fulcrum is positioned at one end, which enables movement. The effort is in the middle, while the load is located on the opposite end.

---

23. second | first | third

6 marks

**Explanation:**

Diagram A is a second-class lever - Fulcrum, load and effort.

Diagram B is a first-class lever - Load, fulcrum, and effort.

Diagram C is a third-class lever - Fulcrum, effort and load.

---

24. true

2 marks

**Explanation:**

The jaws of life used by emergency rescue services are made from high-strength metal, so they can easily cut out the vehicle's metal parts. Aluminium, steel and titanium are used to make the device.

---

25. false

2 marks

**Explanation:**

A broom is classified as a third-class lever. While it doesn't offer a mechanical advantage, it does provide a **distance advantage** when sweeping across the floor.

---

**Total:** 102 Marks