



Subject: Grade 7 Technology

Topic: Technology: Term 2 - Exam 1

Total: 124 Marks

1. B: A] matches with 2 and 3 B] matches with 1 and 4

4 marks

Explanation:

A] Man-made - table and ladder. Parts are built to form these structures. Metal and wood are often used.

B] Natural - beehive and bird's nest. Bees build a beehive from the natural substances they produce. Birds build nests by using grass and small sticks.

A] matches with 2 and 3 B] matches with 1 and 4

2. false

2 marks

Explanation:

The Jaws of Life mini-pat is a **hydraulic** system that uses a syringe, piston, cylinder, tubes, levers and fluid to open or close the blades. It is not a magnetic system. The fluid such as water is used in the syringes and tubes.

3. specifications

3 marks

Explanation:

Specifications describe the requirements to build the mini-pat cell phone tower. It provides measurements, materials, tools, and designs that must be used.

4. false

2 marks

Explanation:

Termite mounds and trees are natural structures that have been created in nature. These are not man-made structures.

5. strong | collapse | local | environment

8 marks

Explanation:

The tower must be **strong** and sturdy. It must not fall down and injure people or animals.

The tower must not **collapse** during heavy winds. A tall structure can cause serious damage if it falls.

The tower construction company must employ **local** workers. This will help uplift the community.

The tower must blend in with the **environment** so that people are not affected by an ugly structure.



6. roof truss

3 marks

Explanation:

A roof truss is not a shell structure. **It is a frame structure.**

7. false

2 marks

Explanation:

The three classes of levers and examples are as follows:

First-class lever - scissors

Second-class lever - wheelbarrow

Third-class lever - human arm

8. C: 1st class - scissors

2nd class - wheelbarrow

3rd class - human arm

4 marks

Explanation:

1st class lever - scissors - effort, fulcrum, load

2nd class lever - wheelbarrow - fulcrum, effort, load

3rd class lever - human arm - fulcrum, load, effort

9. true

2 marks

Explanation:

The Design Process (**Investigate, Design, Make, Evaluate, Communicate - IDMEC**) is the main part of all Technology projects. The written design brief must be done when the model has been built. This forms part of the mini-pat.

10. C: There are two vanishing points.

4 marks

Explanation:

A single-point perspective drawing only has **one vanishing point**.

11. eggshell | eggs | egg

3 marks

Explanation:

Eggs or eggshells are **shell structures**. There is an outer covering or layer that protects its contents. The other objects are frame structures that are made from beams and columns.

12. shell

3 marks

Explanation:

These are examples of **shell structures**: skull, helmet, sea shell, tyre, egg, suitcase, bottle, tent, lunch box, ball, snail shell, tortoiseshell, crab shell and coconut.

13. Cell phones | Wind | Environment | Technology

8 marks

Explanation:

Cell phones did not exist in the world 50 years ago; therefore, people communicated with landline telephones. The landline phone was restricted by the length of the cord.

Old ships travelled around the world by using **wind** energy to move the sails. Sailing ships took a long time to travel across the oceans.

The **environment** must be protected at all times when people develop technological solutions to their problems. Technology must not be detrimental to the land, air, water, plants and animals.

The purpose of **technology** is to develop practical solutions to problems so that people can have the things they want and need. Technology makes life easier.

14. A: **Shell** - human skull, dog kennel **Frame** - spider web, cellphone tower **Solid** - brick, rocks.

4 marks

Explanation:

Shell - (outside is covered) - human skull, dog kennel, tortoiseshell, snail shell, ball.

Frame - (can look through it) - spider web, cellphone tower, scaffold, cage.

Solid - (made of the same material inside and outside.) - bricks, rocks, logs, polystyrene blocks.

15. hidden detail | dimension | construction | name block

8 marks

Explanation:

The hidden detail line is a dashed line showing an item not seen on the top of the drawing. This can be the inside of a cupboard or house.

A dimension line has two arrows showing a measurement. The measurement is written in centimetres or millimetres.

The construction lines are very light in colour to provide a guideline for drawing. These lines are drawn with a light pencil.

The name block details the person who made the drawing. A portfolio of drawings is kept under the person's name.

16. B: Triangulation

4 marks

Explanation:

Frame structures are built strong and stable by connecting the vertical, horizontal and diagonal members to create rigid three-sided formations that can withstand compression and tension forces. The use of **triangulation** creates strength and stability in frame structures.

17. B: A3 B1 C4 D2

4 marks

Explanation:

FRAME: LADDER - vertical and horizontal structural members.

SOLID: BRICK - clay material on the inside of a brick.

SHELL: BOTTLE - protects the contents inside.

COMBINATION: CAR - made up of solid, shell and frame parts.

18. D: A] Tree branches and logs B] Bricks and cement C] Timber D] Mud and grass 4 marks

Explanation:

House A - Tree branches and logs are used where the material is readily available.

House B - Bricks and cement provide a solid structure.

House C - Timber and planks are used for the walls and roof.

House D - Mud and grass. Thatched grass is used on the roof.

19. hydraulic | syringe | fail | levers 8 marks

Explanation:

The Jaws of Life mini-pat is a **hydraulic** system that uses a liquid in the syringe. The pressure of the liquid, such as water, moves the piston in the other syringe.

The **cylinder** piston forces the liquid through the thin plastic tubes connected to another syringe. The syringes are connected with pipes. The liquids must be constantly in the system.

The system can **fail** if there is a leak in the tubes or syringes. This means that the hydraulic system will not work.

The hydraulic system opens and closes the blades by moving the **levers**. The hydraulic system provides the force to operate the lever system. This is a complex mechanism.

20. span 3 marks

Explanation:

The function of a structure such as a bridge over a deep river joining two places is to **span** the space between two objects so that they are connected. The structural term is to **span a gap**.

21. pivot 3 marks

Explanation:

The fulcrum on a lever is also called a **pivot**. The lever will rotate or turn on a pivot.

22. true 2 marks

Explanation:

Oblique drawings are three-dimensional and have measurements for **length, width and height**. Oblique drawings have three views. These are the **front view, top view and side view**.

23. true 2 marks

Explanation:

Chicken and ostrich eggs are examples of **natural shell structures**. Soccer balls or balloons are **man-made shell structures**. A shell structure will protect the contents on the inside. The egg yolk is protected from germs and viruses. The air is sealed and protected inside a ball or balloon.

24. true

2 marks

Explanation:

All technology projects start with gathering information, or it will not be clear what has to be done. This part of the design process is called **investigation**. It requires research to be done before the project starts.

25. flexible

3 marks

Explanation:

The **opposite of rigid is flexible**. Rigid structures are hard, such as brick walls, wooden beams and steel structures. A flexible structure is soft and can bend such as jumping castles.

26. specifications | design brief | dimensions | scale

8 marks

Explanation:

The description and measurements of what the project should look like are part of the **specifications**. These are instructions to make a project.

The notes you write about the project are called a **design brief**. It can also have sketches.

The height, width and depth of the object are called the **dimensions**. It can be measured in centimetres or millimetres.

A real object is often several times bigger than a drawing of it. This is called the **scale** of the drawing. The scale can be large or small.

27. ball

3 marks

Explanation:

A ball is not a frame structure. **It is a shell structure** because it protects the air on the inside from leaking out.

28. towers D and E | towers A and C | towers C and F | tower B

8 marks

Explanation:

Steel cables, known as guys, hold the structures firmly down in **towers D and E**. The steel cables provide extra support for the structure.

The cell phone **towers A and C** are disguised as trees to blend in with the natural environment. The tall towers usually spoil the look of the natural surroundings when they are not disguised as trees.

The concrete block foundation supports the weight of **towers C and F**. Concrete foundations provide extra support for the structures.

Tower B has a broader base and narrow top to balance the structure since no concrete foundation exists. Structures are stable when the base is broader.

29. false

2 marks

Explanation:

A **wheelbarrow** with a load of sand in the middle is an example of a **second-class lever**. The order of the lever parts is the fulcrum, load and effort.

30. triangular | layer | supports | naturally

8 marks

Explanation:

The **triangular** parts of a frame, such as a pylon, make it rigid and stable to prevent the structure from collapsing. Triangles are rigid shapes.

The outer **layer** of a shell structure will protect the contents on the inside. Shell structures in nature are eggs and skulls.

A bridge structure **supports** the load or weight of heavy vehicles. The bridge must be strong enough to carry the weight of vehicles.

Structures such as webs, shells and trees occur **naturally** in the environment. Trees provided the idea for the design of structures such as ladders.

Total: 124 Marks