1. **Match descriptions of materials with the same meaning.**

|  |  |  |
| --- | --- | --- |
| 1 | It doesn’t break easily. \_\_\_\_\_ | it’s soft |
| 2 | You can break it easily. \_\_\_\_\_ | it’s brittle |
| 3 | You can’t bend it. \_\_\_\_\_ | it’s tough |
| 4 | You can bend it, and it doesn’t break. \_\_\_\_\_ | it’s hard |
| 5 | You can cut or scratch it easily. \_\_\_\_\_ | it’s flexible |
| 6 | You can’t cut it or scratch it. \_\_\_\_\_ | it’s corrosion-resistant |
| 7 | It doesn’t burn or melt. \_\_\_\_\_ | it’s rigid |
| 8 | It doesn’t corrode in water or chemicals. \_\_\_\_\_ | it’s heat-resistant |

**2 Delete the one wrong item in each list.**

9 Examples of polymeric materials: *polystyrene, polycarbonate, graphite, nylon*, *plastic*

10 Examples of metals or alloys: *titanium, fibreglass, steel, aluminium, cromoly*

11 Examples of elements and compounds: *oxygen, concrete, acid, ferrum, chloride*

12Examples of composites: *fibreglass, concrete, plywood, polycarbonate, reinforced rubber*

**3 Match the items with their descriptions. Add one property to the answer.**

|  |  |  |
| --- | --- | --- |
| 13 | It’s made of titanium. \_\_\_\_\_ | a climbing rope |
| 14 | These are made of polycarbonate. \_\_\_\_\_ | spark plugs |
| 15 | They’re made of heat-resistant ceramic. \_\_\_\_\_ | a pair of sunglasses |
| 16 | This is made of tough nylon. \_\_\_\_\_ | a bicycle frame |

**4 Complete the sentences with the words from the box below.**

soft / brittle / tough / hard / flexible / corrosion-resistant / rigid / heat-resistant

17 If you drop a steel beam, it doesn’t break. It’s a very \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ material.

18 You can’t bend a concrete beam. It’s a very \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ material.

19 You can only cut glass with a diamond, but not with a knife. It’s a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ material.

20 This ceramic doesn’t burn or melt at high temperatures. It’s \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

21 You can bend this plastic a little, but it doesn’t break. It’s \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

22 You can break glass easily if you drop it. It’s a very \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_material.

23 You can cut or scratch this plastic easily. It’s very \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

24 Aluminium doesn’t corrode in water or chemicals. It’s a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ metal

**5 Match the items with their descriptions. Add one property to the answer.**

|  |  |  |
| --- | --- | --- |
| 25 | They’re made of aluminium. They cool car engines. \_\_\_\_\_ | tennis rackets |
| 26 | They’re made of fibreglass and polystyrene. They are on racing cars. \_\_\_\_\_ | radiators |
| 27 | They’re made of a heat-resistant ceramic. \_\_\_\_\_ | the pistons in a car engine |
| 28 | They have a shaft and head made of graphite. \_\_\_\_\_ | the wings and spoilers of a car |

Part 2 Test 1

**1 Read the text and complete the sentences with words from the text.**

**Steel**

Steel is resistant to corrosion, rusting and general deterioration. It can be used both for exterior as well as internal infrastructure. Compared to conventional concrete buildings, steel buildings offer a longer lifetime and they cause less harm to the environment thanks to the resistance and durability. Because steel buildings are usually pre-fabricated or made in sections and parts that are assembled on the construction site, they are cheaper than conventional buildings

The quantity of carbon contained in steel determines whether the alloy is hard or soft. Nowadays steel buildings are often appreciated for their design. In fact, the flexibility of this material allows different forms and shapes. More than any other building material, steel has a high strength-to-weight ratio. This means that it is easy and cheap to span large distances elegantly eliminating columns. Thanks to this, it is easier to subdivide and customise office- and warehouse space.

1 Steel can be used both for the exterior and the interior \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of a building.

2 Steel is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to corrosion, rusting and general deterioration.

3 Steel buildings have a longer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ compared to conventional concrete buildings.

4 Steel buildings are usually \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ than \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ buildings.

5 It is easy and cheap to span large \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ elegantly.

6 By eliminating \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, it is easier to subdivide and customise office and warehouse space.

**2 Read the text again and match the words to their definitions.**

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | **rusting** | a composite metal made by mixing other metals together |  |
| 2 | **flexibility** | the period of time for which a building is expected to last |  |
| 3 | **alloy** | when a metal becomes reddish brown because of air and water |  |
| 4 | **deterioration** | to change the appearance or characteristics of something according to someone's taste or needs |  |
| 5 | **lifetime** | becoming worse in quality or condition |  |
| 6 | **to customise** | being bent easily without breaking |  |

**3 Make a list of advantages and disadvantages of steel.**

|  |  |
| --- | --- |
| **Advantages** | **Disadvantages** |
|  |  |
|  |  |
|  |  |

**4 Write the translation of the text below**

Part 2 Test 2

**1 Read the text and match each paragraph with a heading.**

**Glass and metals**

A Advantages and disadvantages of different kinds of metals

B Transparent buildings: problems and possible solutions

C An interesting experiment

1 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Glass is a fashionable material in contemporary architecture. Transparent buildings and structures are very popular in contemporary architecture. Structural glass components such as columns and beams are often required, but this material seems structurally unsafe because of its brittleness. For this reason a new construction technique has been developed using:

• very long overlapping glass segments to create glass beams. These are made by bonding the segments adhesively;

• a small stainless steel profile that has been added to the layout of the glass beam to reinforce it.

2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

To prove that glass structures can be as safe as reinforced concrete, an experimental transparent pavilion has been designed (with dimensions 9 x 9 x 3.6 m3) that combines a number of innovative ideas. Many different kinds of glass and glass systems have been used. The outermost and the triple-layered insulating glass units have been tempered and sometimes laminated and some glass has also been coated with solar control glass to reflect some of the unwanted sunshine outwards. In other cases glass that can be heated electrically and glass panes free of iron oxide have been used to make the inside light more natural.

3 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Painted, stainless, hot-dip galvanised and weather resistant steel, as well as aluminium, have also been used for supporting structures. Aluminium has some advantages (it is light, resistant to corrosion and easy to work) but also some disadvantages (its thermal expansion and conductivity are high and it has low elastic modulus and fire resistance). Stainless steel also offers some advantages (it has good fire resistance and it is easy to keep) but its high price is a major disadvantage. Both hot-dip galvanised and painted steel are not as expensive, but they are difficult to work on site and are not resistant to corrosion.

**2 Read the text and decide if these statements are true (T) or false (F). Correct false sentences.**

1 Glass is very popular in contemporary architecture.

2 There is no way to create a glass structure that is as safe as reinforced concrete.

3 A transparent pavilion has been recently designed as an experiment that uses some innovative ideas.

4 There is only one type of glass in this pavilion.

5 Glass has also been used for supporting structures.

6 Hot-dip galvanised steel is not resistant to corrosion.

**3 Match the words with their definitions.**

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | outermost | a metal made from steel that does not rust |  |
| 2 | stainless steel | fragility |  |
| 3 | galvanised | external |  |
| 4 | brittleness | flat sheet of glass |  |
| 5 | pane | coated with zinc to protect it from rust |  |

**4 Write the translation of the 3d paragraph below**

Part 2 Test 3

**1 Read the text and then choose the correct option.**

**Plastic**

Plastic products offer a number of ecological advantages: they save resources, have a low maintenance cost and can be recycled. Furthermore they contribute to save energy (plastic foams are used for thermal insulation in many applications). Plastic is also useful for noise protection and insulation.

The main fields of application of these materials are pipes, insulation, wall covering, flooring (both in houses and in public areas) and, quite recently, window frames (made of PVC). PVC stands for Polyvinyl Chloride and it is the plastic which has seen the most rapid growth in recent times in industry. PVC is often used in piping systems because of its good chemical resistance to corrosive fluids. PVC pipes are used for a great number of applications: to drain waste, for natural gas distribution, for electrical and communications wiring, for municipal water. As it is the newest primary construction material and entirely man-made, plastic is extremely versatile. Improvements made through research have increased its acceptance among designers, contractors and building code officials.

1 Plastic products save \_\_\_\_\_\_\_\_\_

A industry.

B materials.

C resources.

2 Plastic insulation is also useful for \_\_\_\_\_\_\_\_\_ protection.

A recycled

B resources

C noise

3 PVC is the plastic whose use has grown more \_\_\_\_\_\_\_\_\_\_

A recently.

B slowly.

C primary.

4 The \_\_\_\_\_\_\_\_\_ fields of application of these materials are in flooring.

A alternative

B main

C useful

5 PVC has good \_\_\_\_\_\_\_ resistance to corrosive fluids.

A physical

B public

C chemical

6 PVC pipes are used for \_\_\_\_\_\_\_\_\_ gas distribution.

A natural

B chemical

C piping

**2 Read the text again and answer the questions.**

1 What are the advantages offered by plastic products?

2 How can plastic save energy?

3 What is plastic insulation useful for?

4 What are the main fields of application of plastic?

5 What does PVC stand for?

6 What are PVC pipes used for?

**3 Make a list of advantages and disadvantages of plastic.**

|  |  |
| --- | --- |
| **Advantages** | **Disadvantages** |
|  |  |
|  |  |
|  |  |

**4 Write the translation of the text below.**