Reaching for the stars

A From the pyramids at Giza to the Empire State Building, architects have always been obsessed with creating high structures. Until recently the highest skyscraper in the world was Taiwan's Tapei 101 building at 509 metres, but in January 2010 this was superseded by the Burj Khalifa in Dubai, an 828-metre, 160-storey tower.

B The Burj, meaning 'tower' in Arabic, houses luxury apartments, an Armani hotel, swimming pools, offices and even a mosque on the 158th floor. It has a tapered cross-section, ending in a steel [1]**spire**. The exterior is covered in glass, stainless steel and aluminium but despite this modern appearance, the Burj Khalifa is in fact inspired by the repeating patterns found in traditional Islamic design.

C The building is not only spectacular to look at but also has a structure that is quite unique. Traditional skyscrapers are built based on a design known as a 'framed tube', which consists of a strong [2]**perimeter** frame with a hollow centre. In contrast, the Burj has a Y-shaped floor plan, comprising a [3]**reinforced** hexagonal concrete* core which contains the lifts, surrounded by three wings which house the accommodation and offices. Its bottom-heavy footprint, deep [4]**foundations** and the fact that the strongest part of the building is concentrated at the centre, provide a stable structure which minimizes wind damage and makes the tower extremely resistant. Furthermore, the Y-shape allows for a large surface area, ensuring that the apartments and businesses within the Burj have a maximum number of windows and enjoy great views.

D Great care has been taken to ensure that the tower is safe. In light of the terrorist attacks on the World Trade Centre in 2001, architects were concerned about making evacuation from the Burj Khalifa as secure as possible. For this reason, the fire escapes are enclosed by concrete instead of partition walls, and are virtually fire-proof. The building also contains three 'refuge' areas. With such a high structure, wind damage is always an issue, but the extensive wind-tunnel testing and [5]**facade** pressure tests that were carried out should reduce that risk.

E Burj Khalifa is without doubt a great architectural achievement, but some say it was irresponsible to spend over one billion euros on a luxury building in these times of global economic crisis. In fact, although most of its apartments were bought immediately, most remain empty as the owners can't find people to rent them. In spite of the critics, architects will never be able to resist the temptation to build higher and we can be sure it's only a matter of time before somewhere else in the world an even higher skyscraper is constructed.

***concrete:** a strong building material made of cement, sand and other materials

1 Choose the best answer according to the text.

1 The tallest building in the world is ...
   a in Taiwan.
   b around 600 metres tall.
   c no longer in Taiwan.
   d no longer in Dubai.

2 The Burj Khalifa ...
   a looks old-fashioned but has a modern structure.
   b mixes modern and traditional concepts.
   c is made of traditional Arabic building materials.
   d is a place of worship.

3 The structure of the Burj Khalifa is ...
   a stronger at its edges than the centre.
   b stronger at its centre than the edges.
   c not as stable as a framed-tube structure.
   d based on a tube with a strong frame.

4 Wind ...
   a cannot damage the Burj Khalifa.
   b will definitely affect the Burj Khalifa.
   c damage is caused by tunnels of wind.
   d can be damaging to skyscrapers.

2 Match words 1–5 in the text with definitions a–e.

☐ a the base of a building which is constructed underground
☐ b a tall point found at the top of a building
☐ c edge
☐ d the front or outer face of a building
☐ e made extra strong

3 Find words in the text that mean the same as ...

1 level in a building. _____
2 the view of a building seen if we imagine cutting through its vertical axis. _____
3 the map of a building. _____
4 relatively thin walls used for the interior of buildings. _____
5 technology used for testing the effect of the wind on a building. _____

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