1 This question is about properties of materials.

(a) Figure 6 shows some properties of steel and Kevlar®.

property	steel	Kevlar®
density / g cm^{-3}	7.85	1.44
relative strength	1	5
flexibility	low	high
resistance to corrosion	low	high

Figure 6

Body armour, such as a bullet-proof vest, could be manufactured using either of these materials.

Explain **two** reasons why Kevlar® is preferred to steel as the material for body armour.

(4)

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(b) The use of nanoparticles has increased in recent years.

(i) The length of one side of a cube of silver is 2 cm as shown in Figure 7.

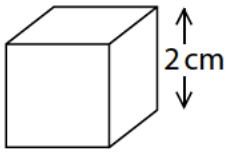


Figure 7

Calculate the surface area to volume ratio of this cube of silver.

(3)

surface area to volume ratio = ...

(ii) Suggest an explanation of why a given mass of silver is more effective as a catalyst when used as nanoparticles rather than in a powder form.

(3)

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(Total for Question 1 = 10 marks)