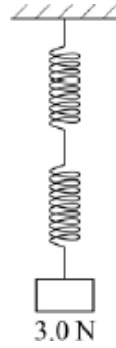


Q1. A load of 3.0 N is attached to a spring of negligible mass and spring constant 15 N m^{-1} .

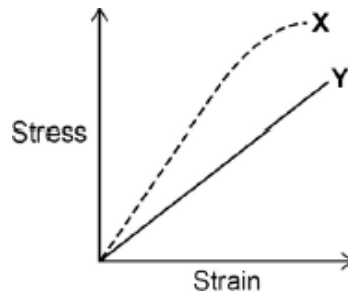


What is the energy stored in the spring?

- A 0.3 J
- B 0.6 J
- C 0.9 J
- D 1.2 J

(Total 1 mark)

Q2. The diagram shows how the stress varies with strain for metal specimens X and Y which are different. Both specimens were stretched until they broke.

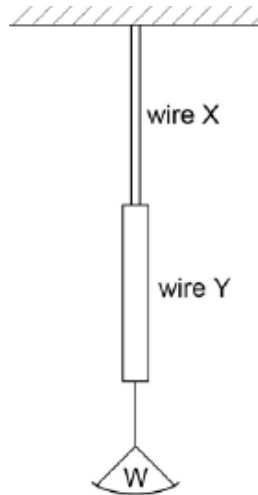


Which of the following is incorrect?

- A X is stiffer than Y
- B X has a higher value of the Young modulus
- C X is more brittle than Y
- D Y has a lower maximum tensile stress than X

(Total 1 mark)

- Q3.** Two vertical copper wires X and Y of equal length are joined as shown. Y has a greater diameter than X. A weight W is hung from the lower end of Y.



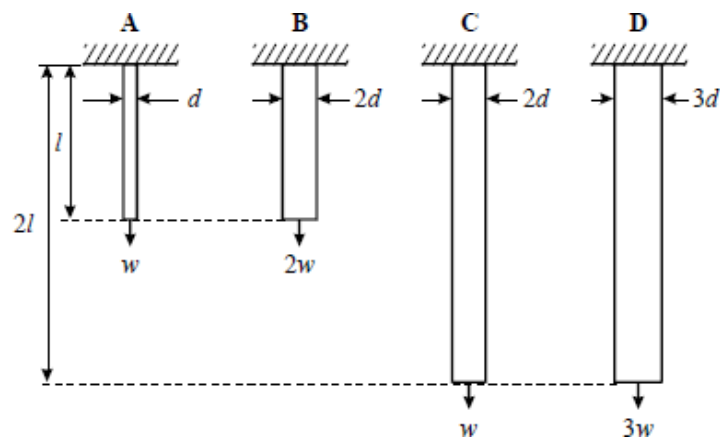
Which of the following is correct?

- A** The strain in X is the same as that in Y.
- B** The stress in Y is greater than that in X.
- C** The tension in Y is the same as that in X.
- D** The elastic energy stored in X is less than that stored in Y.

(Total 1 mark)

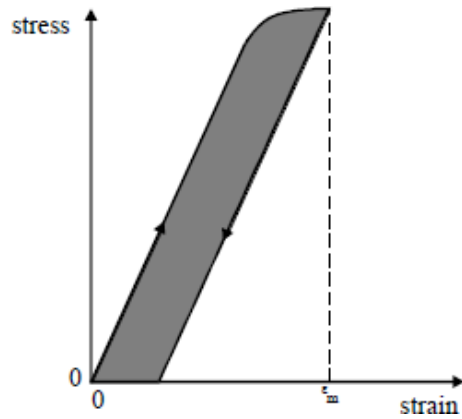
- Q4.** The four bars **A**, **B**, **C** and **D** have diameters, lengths and loads as shown. They are all made of the same material.

Which bar has the greatest extension?



(Total 1 mark)

- Q5.** The graph shows the variation of stress with strain for a ductile alloy when a specimen is slowly stretched to a maximum strain of ϵ_m and the stress is then slowly reduced to zero.

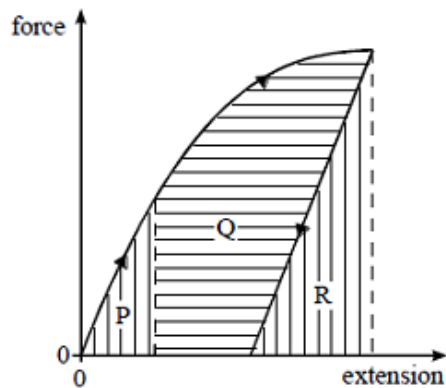


The shaded area

- A** represents the work done per unit volume when stretching the specimen
- B** represents the energy per unit volume recovered when the stress is removed
- C** represents the energy per unit volume which cannot be recovered
- D** has units of J m^{-1}

(Total 1 mark)

- Q6.** The force on a sample of a material is gradually increased and then decreased. The graph of force against extension is shown in the diagram.



The increase in thermal energy in the sample is represented by area

- A** R
- B** $P + Q$
- C** $P + Q + R$
- D** $P + Q - R$

(Total 1 mark)

Q7. A stone is projected horizontally by a catapult consisting of two rubber cords. The cords, which obey Hooke's law, are stretched and released. When each cord is extended by x , the stone is projected with a speed v . Assuming that all the strain energy in the rubber is transferred to the stone, what is the speed of the stone when each cord is extended by $2x$?

- A v
- B $\sqrt{2}v$
- C $2v$
- D $4v$

(Total 1 mark)

M1.	A	[1]
M2.	C	[1]
M3.	C	[1]
M4.	A	[1]
M5.	C	[1]
M6.	B	[1]
M7.	C	[1]

