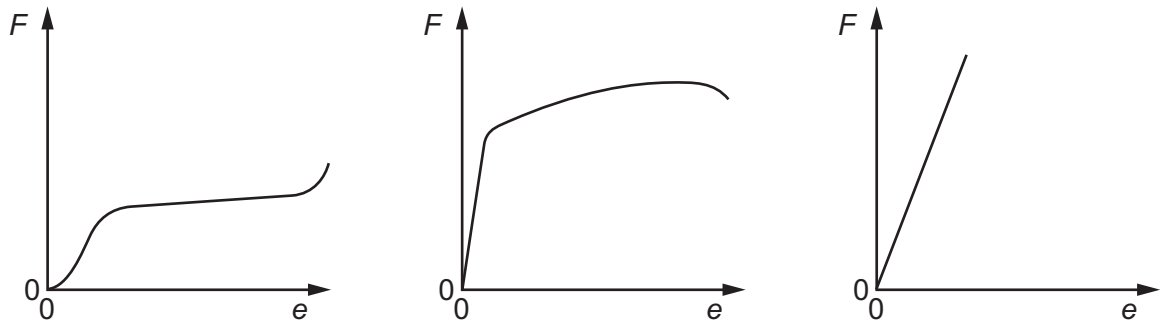
21 Cylindrical samples of steel, glass and rubber are each subjected to a gradually increasing tensile force *F*. The extensions *e* are measured and graphs are plotted as shown below.



graph X graph Y graph Z

Which row correctly relates the graphs to the materials?

	steel	glass	rubber
A	X	Y	Z
B	X	Z	Y
C	Y	X	Z
D	Y	Z	X

22 Two steel wires P and Q have lengths l and $2l$ respectively, and cross-sectional areas A and $\frac{A}{2}$ respectively. Both wires obey Hooke's law.

What is the ratio $\frac{\text{tension in P}}{\text{tension in Q}}$ when both wires are stretched to the same extension?

A $\frac{1}{4}$ **B** $\frac{1}{2}$ **C** $\frac{2}{1}$ **D** $\frac{4}{1}$

23 What do **not** travel at the speed of light in a vacuum?

A electrons

B microwaves

C radio waves

D X-rays

24 The number of wavelengths of visible light in one metre is of the order of

A 10^4. **B** 10^6. **C** 10^8. **D** 10^{10}.