

- 5 A transverse wave on a rope is travelling to the right. Fig. 5.1 shows the waveform at a particular time. Particles Q, R, S, T, U and V are labelled.

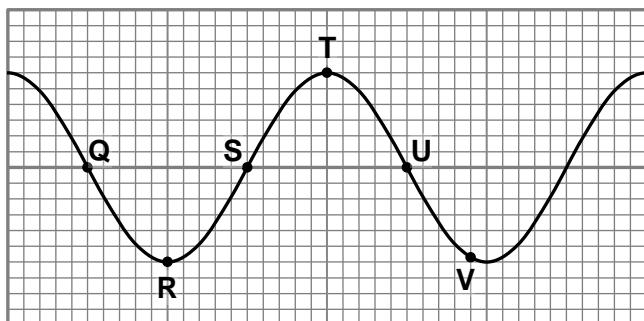


Fig. 5.1

- (a) On Fig. 5.1, indicate using arrows the directions in which the particles Q, S and U are moving. [2]

- (b) State the motion of particles R and T at this instant shown. [1]
- .....

- (c) On Fig. 5.1, mark two particles on the waveform, other than Q, R, S, T and U, that are

- (i) in phase with each other (mark with 'X'),  
(ii) in antiphase with each other (mark with '+'). [2]

- (d) Particle V leads particle U by a phase of  $\phi$ .

Calculate  $\phi$ . Explain your working.

$$\phi = \dots \text{ rad} \quad [2]$$