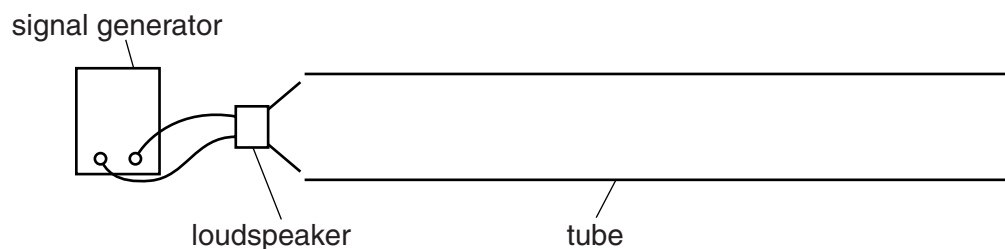


- 4 Fig. 4.1 shows an arrangement for producing stationary waves in a tube that is closed at one end.

For  
Examiner's  
Use



**Fig. 4.1**

- (a) Explain how waves from the loudspeaker produce stationary waves in the tube.

.....

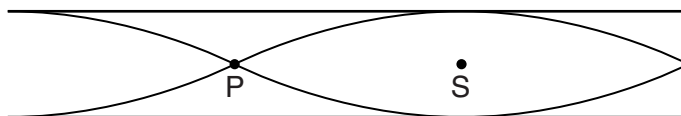
.....

.....

.....

..... [3]

- (b) One of the stationary waves that may be formed in the tube is represented in Fig. 4.2.



**Fig. 4.2**

- (i) Describe the motion of the air particles in the tube at

1. point P,

..... [1]

2. point S.

..... [1]

- (ii) The speed of sound in the tube is  $330 \text{ ms}^{-1}$  and the frequency of the waves from the loudspeaker is  $880 \text{ Hz}$ . Calculate the length of the tube.

length = ..... m [3]