

- 4 A spring having spring constant k hangs vertically from a fixed point. A load of weight L , when hung from the spring, causes an extension e . The elastic limit of the spring is not exceeded.

(a) State

- (i) what is meant by an *elastic deformation*,

.....
.....
.....

[2]

- (ii) the relation between k , L and e .

.....

[1]

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(b) Some identical springs, each with spring constant k , are arranged as shown in Fig. 4.1.

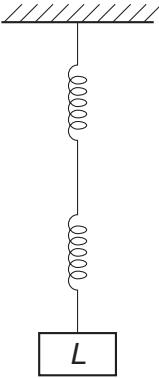
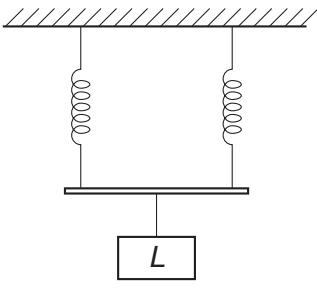
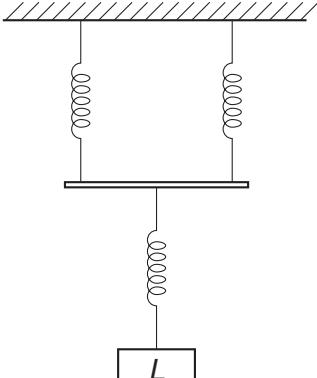
arrangement	total extension	spring constant of arrangement




Fig. 4.1

The load on each of the arrangements is L .

For each arrangement in Fig. 4.1, complete the table by determining

- (i) the total extension in terms of e ,
- (ii) the spring constant in terms of k .