1

(a)

The spring constant *k* of a spring may be determined by using the extension of the spring and load applied, using the apparatus shown in Fig. 1.1.

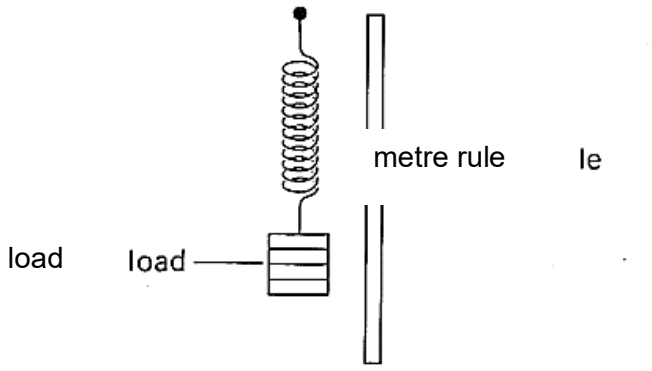

Fig. 1.1

Give one example each of a systematic error and one example of a random error which could occur in this experiment.

.....

……

……

……

[2]

(b)

The work done by a force on a mass is to be calculated using the following formula.

$$W = Fs\cos\theta$$

The following measurements with their uncertainties are made.

force applied F: (0.60 ± 0.01) N

displacement s: (0.750 ± 0.001) m

angle of force to horizontal θ: (30 ± 1) °

Determine the percentage uncertainty of the work done by the force.

percentage uncertainty = ...

[3]