3   (a)   Define *moment of a force*.

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.................…..…… [1]

(b)   A person supports a load of 20 N in his hand as shown in Fig. 3.1. The system of the hand and load is represented by Fig. 3.2. The rod represents the forearm and *T* represents the tension exerted in the biceps. The forearm weighs 65 N.
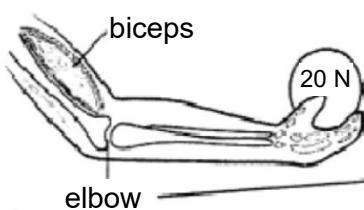
Fig. 3.1
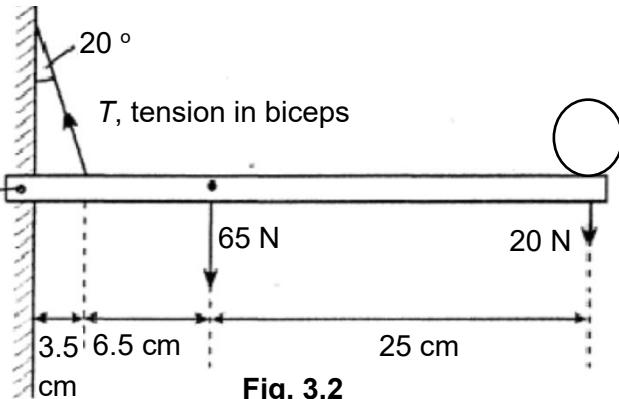
Fig. 3.2

Given that *T* = 410 N, determine the magnitude and direction of the force acting at the elbow.

force acting at the elbow = ………………….. N

direction of the force = ……………………………………………… [4]

(c) In order to break a stack of wooden boards, a karate expert has to move his arm and hand swiftly against it with considerable speed as shown in Fig. 3.3.

Fig. 3.3

Using Newton's laws of motion, explain why he has to execute the karate strike very quickly.

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