**12** A shelf XY is 0.40 m long and is attached to a wall at end X.
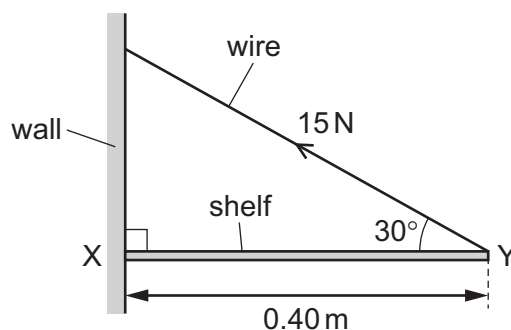
It is kept horizontal by a wire attached to Y and to the wall, as shown.



The tension force in the wire is 15 N at an angle of 30° to the horizontal.

What is the moment of this force about point X?

**A** 3.0 N m          **B** 5.2 N m          **C** 6.9 N m          **D** 12 N m


**13** A statement about the principle of moments with some words omitted is shown.

'For an object in a state of rotational equilibrium, the sum of the clockwise moments about any point is equal to the sum of the anticlockwise moments about ..................... .'

Which words correctly complete the statement?

**A** any point

**B** the centre of gravity of the object

**C** the pivot

**D** the same point


**14** A bird dives to a depth of 1.50 m below the surface of a lake. Atmospheric pressure is 101 kPa. The density of water is 1000 kg m$^{-3}$.

What is the pressure at this depth?

**A** 14.7 kPa          **B** 86.3 kPa          **C** 103 kPa          **D** 116 kPa


**15** Which statement about energy is **not** correct?

**A** Energy is never lost but it may be transferred between different forms.

**B** In an inelastic collision, the total energy is constant.

**C** The efficiency of a system is the ratio of the useful energy output to the total energy input.

**D** When a machine does work, friction reduces the total energy.