13 In a large container in an oil refinery, three oils of different densities are mixed. No chemical activity occurs.

The mixture consists of

1200 kg of oil of density 1100 kg m<sup>-3</sup>,

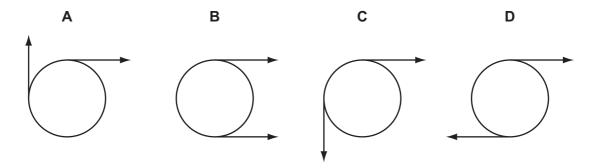
1500 kg of oil of density 860 kg m<sup>-3</sup>,

4000 kg of oil of density 910 kg m<sup>-3</sup>.

What is the density of the mixture?

- **A**  $927 \,\mathrm{kg} \,\mathrm{m}^{-3}$
- **B**  $957 \,\mathrm{kg} \,\mathrm{m}^{-3}$
- $\mathbf{C}$  1010 kg m<sup>-3</sup>
- $1080 \,\mathrm{kg}\,\mathrm{m}^{-3}$
- 14 Two coplanar forces act on the rim of a wheel. The forces are equal in magnitude.

Which arrangement of forces provides only a couple?



15 The density of air on the Earth decreases almost linearly with height from 1.22 kg m<sup>-3</sup> at sea level to 0.74 kg m<sup>-3</sup> at an altitude of 5000 m.

Atmospheric pressure at the Earth's surface on a particular day is  $100\,000\,\text{Pa}$ . The value of g between the Earth's surface and an altitude of  $5000\,\text{m}$  can be considered to have a constant value of  $9.7\,\text{m}\,\text{s}^{-2}$ .

What will be the atmospheric pressure at an altitude of 5000 m?

- **A** 36 000 Pa
- **B** 48000 Pa
- **C** 52000 Pa
- **D** 59000 Pa
- **16** A parachutist is falling at constant (terminal) velocity.

Which statement is **not** correct?

- A Gravitational potential energy is converted into kinetic energy of the air.
- **B** Gravitational potential energy is converted into kinetic energy of the parachutist.
- **C** Gravitational potential energy is converted into thermal energy of the air.
- **D** Gravitational potential energy is converted into thermal energy of the parachutist.