4 **(a)** Define gravitational field strength**.**

……
……

……
…… [1]

(b) Fig 4.1 shows point A and point B on the surface of the Earth and the Moon respectively, along the line joining their centres.

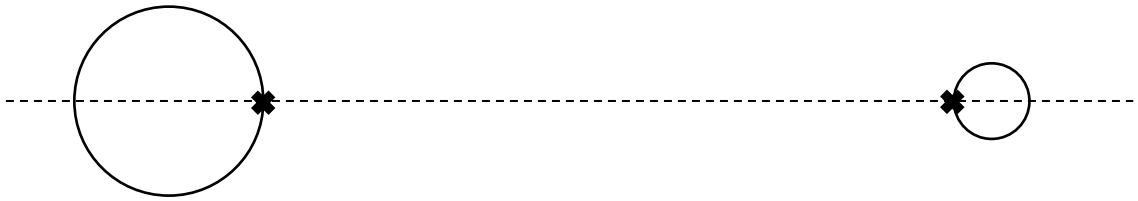

Fig 4.1 (not to scale)

(i) There exist a point X on the line joining the centres of Earth and Moon where the resultant gravitational field strength is zero. Estimate and label this point X on Fig 4.1. [1]

(ii) The mass of Earth is 5.97×10^{24} kg, the mass of Moon is 7.34×10^{22} kg, the radius of Earth is 6.37×10^{3} km, and the radius of Moon is 1.74×10^{3} km. The centre-to-centre distance between Earth and Moon is 3.84×10^{5} km.

Determine the magnitude of gravitational field strength at A and B respectively.

gravitational field strength at A = ... N kg^{-1}

gravitational field strength at B = ... N kg^{-1}

[3]

(iii) Without further calculations, sketch the variation with distance d of gravitational field strength g, experienced along the line joining the centre of Earth and Moon between points A and B in Fig. 4.2. [1]

Fig. 4.2

[Total: 6 marks]