4. (b) The intensity of solar radiation at the surface of the Earth is 1.38 kW m^{-2}. The orbital radii of Earth and Mars are respectively 1.496×10^8 km and 2.280×10^8 km. Estimate the surface temperature of Mars assuming that both planets behave like blackbodies.

[6 marks]

5. (a) A beam of monochromatic UV light with wavelength 50 nm is incident onto a blackened flat plate of total area 200 cm^2. The direction of the beam is normal to the surface of the plate. The beam has an intensity of 24 W m^{-2}. Calculate the force exerted by the light beam on the surface of the plate. State any assumption you make in your calculation.

[4 marks]