The India Space Research Organisation planned to launch a geostationary satellite to provide broadcasting services. The mass of the satellite is 5.9×10^3 kg and the mass of the Earth is 5.9×10^{24} kg. The Earth has a radius of 6.4×10^6 m.

(a)

State one advantage and one disadvantage of using a geostationary orbit for a broadcasting satellite.

advantage

disadvantage

[2]

(b)

Show that the angular velocity of the geostationary satellite when it is in orbit around the Earth is 7.3×10^{-5} rad s^{-1}.

[1]

(c)

Calculate the radius of the geostationary orbit.

radius =

m

[2]

(c)

Calculate the kinetic energy of the satellite when it is in the geostationary orbit.

kinetic energy =

J

[Total:7]

[2]