

⑦ (a) State Newton's law of gravitation.

Newton's law of gravitation states that every particle of matter attracts other particle of matter with a force $G \frac{Mm}{r^2}$, where M, m are the masses of the two particles, r is the distance between them and G is the constant of gravitation whose value is approximately 6.66×10^{-8} dyne $(\text{cm})^2/\text{gm}^2$.

⑧ (b) State Kepler's laws of planetary motion and deduce them from Newton's law of gravitation.

KEPLER'S LAWS OF PLANETARY MOTION:-

(I) Each planet describes an ellipse with the sun at one of the foci.

(II) The radius vector drawn from the sun to the planet sweeps out equal area in equal intervals of time.

(III) The square of the periodic time of a planet is proportional to the cube of the semi-major axis of its orbit.