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Question 1:
State the universal law of gravitation
Answer 1:
The universal law of gravitation states that every object in the universe attracts every other object with a force called the gravitational force. The force acting between two objects is directly proportional to the product of their masses and inversely proportional to the square of the distance between their centers.

For two objects of masses m_1 and m_2 and the distance between them r, the force (F) of attraction acting between them is given by the universal law of gravitation as:

$$F = \frac{Gm_1m_2}{r^2}$$

Where, G is the universal gravitation constant and its value is $6.67 \times 10^{-11} Nm^2kg^{-2}$.

Question 2:
Write the formula to find the magnitude of the gravitational force between the earth and an object on the surface of the earth.
Answer 2:
Let M_E be the mass of the Earth and m be the mass of an object on its surface. If R is the radius of the Earth, then according to the universal law of gravitation, the gravitational force (F) acting between the Earth and the object is given by the relation:

$$F = \frac{GM_Em}{R^2}$$