

## Test 7 : Science

Name of student:

Time: 40 minutes

Number of questions: 8

Total marks: 40 marks

Question 1. State the universal law of gravitation.

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.

Question 3. Write down the importance of the universal law of gravitation.

Question 4. The mass of the earth is  $6 \times 10^{24}$  kg and that of the moon is  $7.4 \times 10^{22}$  kg. If the distance between the earth and the moon is  $3.84 \times 10^5$  km, calculate the force exerted by the earth on the moon. (Take  $G = 6.7 \times 10^{-11}$  N m<sup>2</sup> kg<sup>-2</sup>)

Question 5. Calculate the value of  $g$ , given universal gravitational constant,  $G = 6.7 \times 10^{-11}$  N m<sup>2</sup> kg<sup>-2</sup>, mass of the earth,  $M = 6 \times 10^{24}$  kg, and radius of the earth,  $R = 6.4 \times 10^6$  m.

Question 6. A car falls off a ledge and drops to the ground in 0.5 s. Let  $g = 10$  m s<sup>-2</sup> (for simplifying the calculations).

- (i) What is its speed on striking the ground?
- (ii) What is its average speed during the 0.5 s?
- (iii) How high is the ledge from the ground?

Question 7. An object is thrown vertically upwards and rises to a height of 10 m.

Calculate (i) the velocity with which the object was thrown upwards and (ii) the time taken by the object to reach the highest point.

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Question 8. An object weighs 10 N when measured on the surface of the earth. What would be its weight when measured on the surface of the moon?