Gravitation

1. How do you explain that an object is in uniform circular motion (AS1)

2. Caliculate the acceleration of the moon towards earth's center. (AS1)

3. Explain universal law of gravitation. (AS1)

4. Explain some situations where the center of gravity of man lies outside the body. (AS1)

5. Where does the center of gravity of the atmosphere of the earth lie?(AS2)

6. Explain why a long pole is more beneficial to the tight rope walker if the pole has slight bending. (AS7)

7. A car moves with constant speed of 10 m/s in a circular path of radius 10m. The mass of the car is 1000 kg. How much is the required centripetal force for the car? (Ans:104N) (AS1)

8. What is the speed of an apple dropped from a tree after 1.5 second? What distance will it cover during this time? Take g=10m/s2 (AS1) (Ans: 15m/s; 11.25m)

9. A ball is projected vertically up with a speed of 50 m/s. Find the maximum height , the time to reach the maximum height, and the speed at the maximum height (g=10 m/ s2) (AS1) (Ans: 125m; 5s; zero)

10. Two spherical balls of mass 10 kg each are placed with their centers 10 cm apart. Find the gravitational force of attraction between them. (AS1) (Ans: 104G.Newton)

11. Find the free-fall acceleration of an object on the surface of the moon, if the radius of the moon and its mass are 1740 km and 7.4 x 1022 kg respectively. Compare this value with free fall acceleration of a body on the surface of the earth. (AS1) (Ans: approximately 1.63 m/s2)

12. A ball is dropped from a height. If it takes 0.2s to cross the last 6m before hitting the ground, find the height from which it is dropped. Take g = 10m/ s2 (AS1) (Ans: 48.05m)

13. The bob of a simple pendulum of length 1 m has mass 100g and a speed of 1.4 m/ s at the lowest point in its path. Find the tension in the string at this moment. Take g = 9.8m/sec2 (AS1) (Ans: 1.176N)

14. What path will the moon take when the gravitational interaction between the moon and earth disappears? (AS2)

15. Can you think of two particles which do not exert gravitational force on each other why? (AS2)

16. Why is it easier to carry the same amount of water in two buckets, one in each hand rather than in a single bucket? (AS7)

17. A man is standing against a wall such that his right shoulder and right leg are in contact with the surface of the wall along his height. Can he raise his left leg at this position without moving his body away from the wall? Why? Explain. (AS7)

18. An apple falls from a tree. An insect in the apple finds that the earth is falling towards it with an acceleration 'g'. Who exerts the force needed to accelerate the earth with this acceleration? (AS7)

1. The acceleration which can change only the direction of velocity of a body is called [ ]
a) Acceleration due to gravity b) Uniform acceleration
c) Centripetal acceleration d) Centrifugal acceleration

2. The distance between the Earth and the Moon is [ ]
a) 3,84,400 Km b) 3,84,400 cm c) 84,000 Kmd) 86,000 Km

3. The value of Universal Gravitaitonal Constant is [ ]
a)6.67 x 10-11N.m2Kg-2 b) 9.8 m/ Sec 2
c) 6.67 x 10-12N.m2Kg-2 d) 981 m/ Sec2

4. The weight of an object whose mas is 1 Kg is [ ]
a) 1 Kg/m2 b) 9.8 m/Sec2 c) 9.8 N d) 9.8 N/m2

5. The state of a freely falling body is [ ]
a) Heavy wiehgt b) Less weight c) Weight less d) Constant weight