INDIAN SCHOOL DARSAIT
DEPARTMENT OF PHYSICS

Subject : Physics	**Chapter** : Gravitation	**Worksheet No**. 8
Resource Person : Mrs. Jayalakshmi Ratish		**Date** :
Name of the Student :_____	**Class & Division** : XI A/B	**Roll Number** : ___

1.   A tennis ball and a cricket ball are to be projected out of gravitational field of the earth. Do we need different velocity to achieve so?   1

2.   What is the maximum value of Gravitational Potential Energy?   1

3.   Is it possible to place a satellite such that it is always over New Delhi? Why?   1

4.   From where does a satellite revolving around a planet get the required centripetal acceleration?   1

5.   Show graphically how the gravitational potential varies with distance from the centre of the earth.   1

6.   Does the speed of a satellite remain constant in an orbit? Explain.   2

7.   Find the value of g at a height 400 km above the earth's surface?   2

8.   A body weighs 90 kgf on the surface of earth. How much will it weigh on the surface of a planet whose mass is $\frac{1}{9}$ that of earth and radius is $\frac{1}{2}$ that of earth.   2

9.   The radii of two planets are R and 2R respectively and their densities ρ and ρ/2 respectively. What is the ratio of acceleration due to gravity at their surfaces?   2

10.   Show the variation of g with altitude and depth from the earth surface by means of a graph.   2

11.   Determine the escape velocity of a body from the moon if $R_m = 1.7 \times 10^6$ m, g = 1.63 m/s^2 2

12.   A Saturn year is 29.5 times the Earth year. How far is the Saturn from the sun if the earth is 1.5×10^8 km away from sun?   2

13.   A body weighs 63 N on the earth's surface. What is the gravitational force on it due to the earth at a height equal to half the radius of earth?   3

14.   An artificial satellite is going around the earth at a distance of 1600 km. Calculate the period of revolution and orbital velocity?   3

15.   A body weights 90 kg on the surface of Earth. How much will it weigh on the surface of Mars whose mass is 1/9th and radius is ½ of that of Earth.   3

16.   At a point above the earth's surface, the gravitational potential is -5.12×10^7 J/kg and the acceleration due to gravity is 6.4 m/s^2. Assuming the mean radius of the earth to be 6400 km, calculate the height of this point above the earth's surface?   3

17.   A rocket is launched vertically from the earth's surface with an initial speed of 10 km/s. How far above the earth's surface would it go?   3

18.   The period of moon around the earth is 27.3 days and the radius of the orbit is 3.9×10^5 km. Find the mass of the earth?   3

19. At what height from the Earth's surface will the value of g be reduced by 40 % from the value at the surface? Radius of Earth = 6400km   3

20. Determine the gravitational field and gravitational potential due to a thin spherical shell of mass 10 kg and radius 1m at an internal point.   3

21. Explain which amongst the following curves can represent possible trajectories traced by a projectile (neglect air resistance)   3
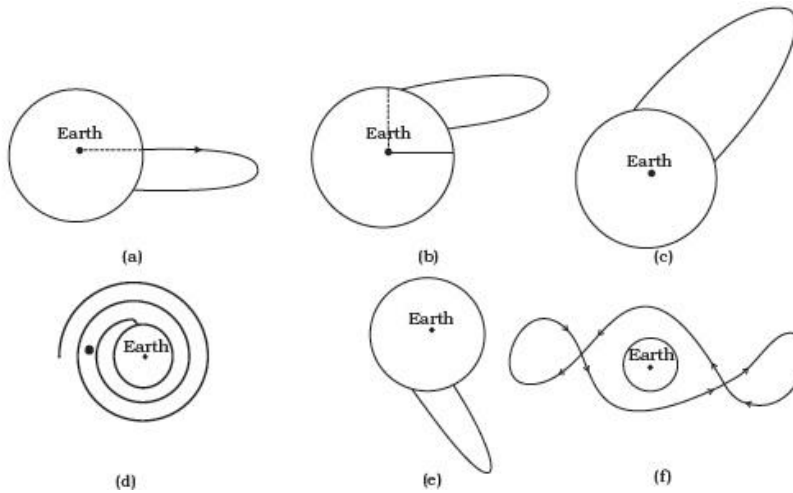
22. What is meant by weightlessness of a body? Explain why an astronaut floats inside a satellite?   3

23. An artificial satellite of mass 100kg is in a circular orbit at 500 km above the Earth's surface. Take radius of Earth as 6400 km.   3

    (a) What is acceleration due to gravity at any point along the satellite's path?

    (b) What is centripetal acceleration of the satellite? (take g =9.81 m/s^2)

24. Find the percentage decrease in the weight of a body when taken 16 km below the surface of the Earth. Take the Radius of earth as 6400km.   3

25. Which is greater – the attraction of 1 kg of lead for Earth or force of attraction of Earth for 1 kg of lead? Determine the accelerations of both the lead and Earth.   3