St. Lawrence High School

A Jesuit Christian Minority Institution

Term : 1st

Solution of Work Sheet – 28

Class – XI | Subject – Physics | Date – 01.08.20

Chapter – Gravitation | Topic – Artificial satellite

Choose the correct option for the following questions. $1 \times 15 = 15$

1. The period of revolution of a certain planet in an orbit of radius R is T. Its period of revolution in an orbit of radius 4R will be –
   a. 2T
   b. T
   c. 4T
   d. 8T
2. The escape velocity from earth is 11.2km/s. the escape velocity from a planet having twice the radius and the same mean density is –
   a. 11.2km/s
   b. 5.6km/s
   c. 22.4km/s
   d. 15.8km/s
3. If v_o be the orbital velocity of a satellite in a circular orbit close to the earth's surface and v_e is the escape velocity from the earth, then the relation between two will be –
   a. $v_o = v_e$
   b. $v_e = \sqrt{2}v_o$
   c. $v_e = \sqrt{3}v_o$
   d. $v_o = 2v_e$
4. The orbital velocity for an earth satellite near the surface of earth is 7km/s. if the radius of the orbit is 4 times the radius of earth, its orbital velocity would be –
   a. 7km/s
   b. 3.5km/s
   c. $7\sqrt{2}km/s$
   d. 14km/s
5. A satellite is moving around earth with a speed v in a circular orbit of radius r. if the orbital radius is decreased by 1%, its speed will –
   a. Increase by 1%
   b. Increase by 0.5 %
   c. Decrease by 1 %
   d. Decrease by 0.5 %
6. If the distance between earth and sun were half of its present value, the number of days in a year would have been –
   a. 64.5
   b. 182.5
   c. 730
   d. 129

7. What will be the duration of day and night (in hrs) if the diameter of the earth is suddenly reduced to half of its original value, the mass remaining constant?
   a. 3
   b. 6
   c. 2
   d. 12
8. The escape velocity of a body on the surface of earth is 11.2km/s. if earth's mass increases to twice its present value and radius of earth is becomes half, the escape velocity becomes –
   a. 5.6 km/s
   b. 11.2 km/s
   c. 22.4 km/s
   d. 44.8 km/s
9. Chose the correct option –
   a. g is same at all places on the surface of earth
   b. g has its maximum value at the equator
   c. g is less at the earth's surface than at a height or depth
   d. g is greater at pole than equator
10. If the radius of earth is contracted by 2% and it mass remain same, then the weight of the body at the earth's surface –
   a. Will increase
   b. Will decrease
   c. Will remain same
   d. None of the above
11. The escape velocity of the earth is v. If the mass of the certain planet is 3 times and radius is also 3 times that of earth, then escape velocity for that planet will be –
   a. 3v
   b. 6v
   c. $\sqrt{3}v$
   d. v
12. If the distance between earth and sun is doubled, then the new time period of revolution will be –
   a. ½ year
   b. $2\sqrt{2}\ years$
   c. 4 years
   d. 8 years
13. A small satellite is revolving near the earth's surface. Its orbital velocity will be nearly –
   a. 6 km/s
   b. 4 km/s
   c. 11.2 km/s
   d. 8 km/s
14. The period of revolution of a planet A around sun is 8 times that of planet B. the distance of A is how many times greater than that of B from sun?
   a. 2
   b. 3
   c. 4
   d. 5
15. The weight of a body is maximum on the earth's surface at –
   a. Poles
   b. Equator
   c. An angular position of 45^0 with
   d. Its is same everywhere