DPP
DAILY PRACTICE PROBLEMS

CLASS : XIth **SUBJECT : PHYSICS**
Date : **DPP No. : 1**

TOPIC :- GRAVITATION

1. Halley's comet has a period of 76, had distance of closest approach to the sun equal to 8.9×10^{10}m. the comet's farthest distance from the sun if the mass of sun is 2×10^{30} kg and $G = 6.67 \times 10^{11}$ in MKS units is
   a) 2×10^{12}m b) 2.7×10^{13}m c) 5.3×10^{12}m d) 5.3×10^{13}m

2. Average density of the earth
   a) does not depend on g b) is a complex function of g
   c) is directly proportional to g d) is inversely proportional g

3. Let g be the acceleration due to gravity at earth's surface and K be the rotational kinetic energy of the earth. Suppose the earth's radius decreases by 2% keeping all other quantities same, then
   a) g decreases by 2% and K decreases by 4% b) g decreases by 4% and K increases by 2%
   c) g increases by 4% and K increases by 4% d) g decreases by 4% and K increases by 4%

4. A body is taken to a height of nR from the surface of the earth. The ratio of the acceleration due to gravity on the surface to that at the altitude is
   a) $(n+1)^2$ b) $(n+1)^{-2}$ c) $(n+1)^{-1}$ d) $(n+1)$

5. Infinite number of masses, each 1 kg, are placed along the x-axis at $x = \pm 1\text{m}, \pm 2\text{m}, \pm 4\text{m}, \pm 8\text{m}, \pm 16\text{m}$ ..... The magnitude of the resultant gravitational potential in terms of gravitational constant G at the origin $(x = 0)$ is
   a) $G/2$ b) G c) $2G$ d) $4G$

6. In the above problem, the ratio of the time duration of his jump on the moon to that of his jump on the earth is
   a) 1 : 6 b) 6 : 1 c) $\sqrt{6} : 1$ d) $1 : \sqrt{6}$

7. The escape velocity from the earth is $11\ \text{kms}^{-1}$. The escape velocity from a planet having twice the radius and same mean density as that of earth is
   a) $5.5\ \text{kms}^{-1}$ b) $11\ \text{kms}^{-1}$ c) $22\ \text{kms}^{-1}$ d) None of these

8. The escape velocity of a planet having mass 6 times and radius 2 times as that of earth is
   a) $\sqrt{3}\,V_e$ b) $3\,V_e$ c) $\sqrt{2}\,V_e$ d) $2\,V_e$

9. Kepler discovered
   a) Laws of motion b) Laws of rotational motion
   c) Laws of planetary motion d) Laws of curvilinear motion

10. In the solar system, which is conserved
    a) Total Energy b) K.E. c) Angular Velocity d) Linear Momentum

11. A small satellite is revolving near earth's surface. Its orbital velocity will be nearly
a) $8\ km/sec$ b) $11.2\ km/sec$ c) $4\ km/sec$ d) $6\ km/sec$

12. The ratio of the radius of the earth to that of the moon is 10. The ratio of acceleration due to gravity on the earth and on the moon is 6. The ratio of the escape velocity from the earth's surface to that from the moon is
a) 10 b) 6 c) Nearly 8 d) 1.66

13. A mass m is placed at a point B in the gravitational field of mass M. When the mass m is brought from B to near point A, its gravitational potential energy will
a) Remain unchanged b) Increase c) Decrease d) Become zero

14. The centripetal force acting on a satellite orbiting round the earth and the gravitational force of earth acting on the satellite both equal F. The net force on the satellite is
a) Zero b) F c) $F\sqrt{2}$ d) $2\ F$

15. The largest and the shortest distance of the earth from the sun are r_1 and r_2, its distance from the sun when it is at the perpendicular to the major axis of the orbit drawn from the sun
a) $\frac{r_1 + r_2}{4}$ b) $\frac{r_1 r_2}{r_1 + r_2}$ c) $\frac{2r_1 r_2}{r_1 + r_2}$ d) $\frac{r_1 + r_2}{3}$

16. The escape velocity for a body of mass 1 kg from the earth's surface is $11.2\ \text{kms}^{-1}$. The escape velocity for a body of mass 100 kg would be
a) $11.2 \times 10^2 \text{kms}^{-1}$ b) $112\ \text{kms}^{-1}$ c) $11.2\ \text{kms}^{-1}$ d) $11.2 \times 10^{-2} \text{kms}^{-1}$

17. The relay satellite transmits the T.V. programme continuously from one part of the world to another because its
a) Period is greater than the period of rotation of the earth
b) Period is less than the period of rotation of the earth about its axis
c) Period has no relation with the period of the earth about its axis
d) Period is equal to the period of rotation of the earth about its axis

18. A man weighs 80 kg on earth surface. The height above ground where he will weigh 40kg, is (radius of earth is 6400 km)
a) 0.31 times r b) 0.41 times r c) 0.51 times r d) 0.61 times r

19. At what temperature, the hydrogen molecule will escape from earth's surface?
a) 10^1 K b) 10^2 K c) 10^3 K d) 10^4 K

20. An earth satellite of mass m revolves in a circular orbit of a height h from the surface of the earth. R is the radius of the earth and g is acceleration due to gravity at the surface of the earth. The velocity of the satellite in the orbit is given by
a) $\frac{gR^2}{R+h}$ b) gR c) $\frac{gR}{R+h}$ d) $\sqrt{\frac{gR^2}{R+h}}$