DPP
DAILY PRACTICE PROBLEMS

CLASS : XIth **SUBJECT : PHYSICS**
Date : **DPP No. : 6**

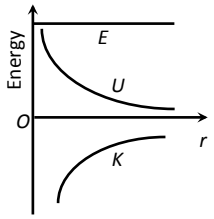
Topic :- GRAVITATION

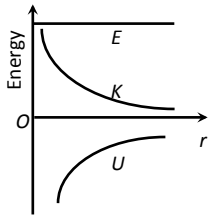
1. If three particles each of mass M are placed at the three corners of an equilateral triangle of side a, the forces exerted by this system on another particle of mass M placed (i) at the mid point of a side and (ii) at the centre of the triangle are respectively
   a) 0, 0 b) $\frac{4GM^2}{3a^2}$,0 c) 0, $\frac{4GM^2}{3a^2}$ d) $\frac{3GM^2}{a^2}, \frac{GM^2}{a^2}$

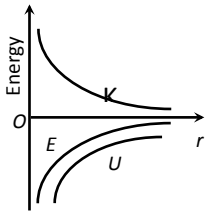
2. In the above Question find apparent weight of the object?
   a) 3 N b) Zero c) 2 N d) 0.2 N

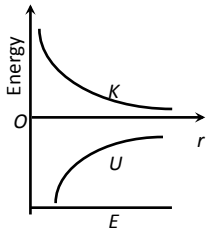
3. Two identical satellite A and B are circulating round the earth at the height of R and $2R$ respectively. (where R is radius of the earth). The ratio of kinetic energy of A to that of B is
   a) $\frac{1}{2}$ b) $\frac{2}{3}$ c) 2 d) $\frac{3}{2}$

4. Sun is about 330 times heavier and 100 times bigger in radius than earth. The ratio of mean density of the sun to that of earth is
   a) 3.3×10^{-6} b) 3.3×10^{-4} c) 3.3×10^{-2} d) 1.3

5. The correct graph representing the variation of total energy (E) kinetic energy (K) and potential energy (U) of a satellite with its distance from the centre of earth is
   a) 

   b) 

   c) 

   d) 

6. At what height above the earth's surface does the force of gravity decrease by 10%? The radius of the earth is 6400 km?
   a) 345.60 km b) 687.20 km c) 1031.8 km d) 12836.80 km

7. A body is projected upwards with a velocity of 4×11.2 kms^{-1} from the surface of earth. What will be the velocity of the body when it escapes from the gravitational pull of earth?
a) 11.2 kms^{-1} b) 2×11.2 kms^{-1} c) 3×11.2 kms^{-1} d) $\sqrt{15} \times 11.2$ kms^{-1}

8. The mean radius of the earth's orbit round the sun is 1.5×10^{11}. The mean radius of the orbit of mercury round the sun is $6 \times 10^{10} m$. The mercury will rotate around the sun in
a) A year b) Nearly 4 years c) Nearly $\frac{1}{4}$ year d) 2.5 years

9. The mass of the moon is 1/81 of earth's mass and its radius 1/4th that of the earth. If the escape velocity from the earth's surface is 11.2 kms^{-1}, its value for the moon will be
a) 0.15 kms^{-1} b) 5 kms^{-1} c) 2.5 kms^{-1} d) 0.5 kms^{-1}

10. g_e and g_p denote the acceleration due to gravity on the surface of the earth and another planet whose mass and radius are twice to that of the earth, then
a) $g_p = \frac{g_e}{2}$ b) $g_p = g_e$ c) $g_p = 2g_e$ d) $g_p = \frac{g_e}{\sqrt{2}}$

11. Gas escapes from the surface of a planet because it acquires an escape velocity. The escape velocity will depend on which of the following factors :
I. Mass of the planet
II. Mass of the particle escaping
III. Temperature of the planet
IV. Radius of the planet
Select the correct answer from the codes given below :
a) I and II b) II and IV c) I and IV d) I, III and IV

12. A space ship moves from earth to moon and back. The greatest energy required for the space ship is to overcome the difficulty in
a) Entering the earth's gravitational field
b) Take off from earths field
c) Take off from lunar surface
d) Entering the moon's lunar surface

13. A body has weight 90 kg on the earth's surface, the mass of the moon is 1/9 that of the earth's mass and its radius is 1/2 that of the earth's radius. On the moon the weight of the body is
a) 45 kg b) 202.5 kg c) 90 kg d) 40 kg

14. A body revolved around the sun 27 times faster than the earth. What is the ratio of their radii
a) 1/3 b) 1/9 c) 1/27 d) 1/4

15. The orbital angular momentum of a satellite revolving at a distance r from the centre is L. If the distance is increased to $16r$, then the new angular momentum will be

a) $16\ L$ b) $64\ L$ c) $\frac{L}{4}$ d) $4\ L$

16. A man can jump to a height of $1.5\ m$ on a planet A. What is the height he may be able to jump on another planet whose density and radius are, respectively, one-quarter and one-third that of planet A

a) $1.5\ m$ b) $15\ m$ c) $18\ m$ d) $28\ m$

17. If satellite is shifted towards the earth. Then time period of satellite will be

a) Increase b) Decrease c) Unchanged d) Nothing can be said

18. If the force inside the earth surface varies as x^n, where r is the distance of body from the centre of earth, then the value of n will be

a) -1 b) -2 c) 1 d) 2

19. If the value of g acceleration due to gravity at earth surface is 10 ms^{-2}. Its value in ms^{-2} at the centre of the earth, which is assumed to be a sphere of radius R metre and uniform mass density is

a) 5 b) $10/R$ c) $10/2R$ d) Zero

20. A body of mass m rises to a height $h = R/5$ from the surface of earth, where R is the radius of earth. If g is the acceleration due to gravity at the surface of earth, the increase in potential energy is

a) $(4/5)mgh$ b) $(5/6)mgh$ c) $(6/7)mgh$ d) mgh