# PHYSICS

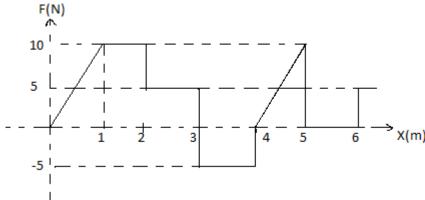| | |
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| **Class** | **PUC 2nd Yr.** |
| | **Paper problems (CET)** |
| **Topic** | **WEP** |

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1. The relationship between force F and position x is shown by the solid curve. The work done in displacing the body from x = 1 to x = 5 is

    (A) 30 J  (B) 15 J

    (C) 25 J  (D) 20 J

2. When a body moves in a circular path, no work is done by the force since,

    (A) There is no displacement  (B) There is no net force

    (C) Force and displacement are perpendicular to each other.

    (D) The force is always from the center.

3. The work done in carrying a charge q once round a circle of radius R with charge Q at its center is

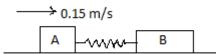    (A) $\dfrac{qQ}{4\pi\varepsilon_0 R}$  (B) $\dfrac{qQ}{4\pi\varepsilon_0^2 R^2}$

    (C) $\dfrac{qQ}{4\pi\varepsilon_0 R^2}$  (D) None of these

4. A satellite in a circular orbit of radius R has a period of 4 hours. Another satellite with an orbit of radius 3R around the same planet will have a period (in hours)

    (A) 16  (B) 4

    (C) $4\sqrt{27}$  (D) $4\sqrt{8}$



5. Two rectangular blocks A and B of masses 2 kg and 3 kg are connected by a massless spring of constant 10.8 N/m and placed on a frictionless horizontal surface. The block A is given an initial velocity of 0.15 m/s in the direction shown. The maximum compression of the spring during the motion (in m) is

(A) 0.02            (B) 0.05            (C) 0.03            (D) 0.01

6. A body of mass 5 kg is thrown vertically up with a kinetic energy of 490 J. The height at which the kinetic energy of the body becomes half of the initial value is (g = 9.8 ms$^{-2}$)
   (A) 5 m            (B) 2.5 m            (C) 10 m            (D) 12.5 m

7. Two satellites of masses m and 9m are orbiting a planet in a circular orbit of radius R. Their periods of revolution will be in the ratio of
   (A) 9: 1            (B) 3: 1            (C) 1: 1            (D) 1: 3

8. The circular motion of a particle with constant speed is

   (A) Periodic but not SHM                    (B) SHM but not periodic
   (C) Periodic and also SHM                  (D) neither periodic nor SHM

9. Two bodies of masses $m_1$ and $m_2$ are acted upon by a constant force F for a time t. They start from rest and acquire kinetic energies $E_1$ and $E_2$ respectively. Then the ratio $\dfrac{E_1}{E_2}$ is

   (A) $\dfrac{m_1}{m_2}$            (B) $\dfrac{m_2}{m_1}$            (C) 1            (D) $\dfrac{\sqrt{m_1 m_2}}{m_1 + m_2}$

10. A truck accelerates from speed v to 2v. Work done during this is
    (A) Three times the work done in accelerating it from rest to v
    (B) Same as the work done in accelerating it from rest to v
    (C) Four times the work done in accelerating it from rest to v
    (D) Less than the work done in accelerating it from rest to v

11. A 10 kg metal block is attached to a spring of constant 1000 N/m. A block is displaced 10 cm from its equilibrium position and released. The maximum acceleration of the block in ms$^{-2}$ is
    (A) 10            (B) 200            (C) 100            (D) 0.1

12. A rotating wheel changes its angular speed from 1800 rpm to 3000 rpm in 20 sec. What is its angular acceleration assuming it to be uniform? (in $\pi$ rad/s$^{-2}$)

    (A) 60            (B) 90            (C) 2            (D) 40