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# RK Academy

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## WEEKLY TEST CHAPTER – WORK, POWER, ENERGY

CLASS: XI

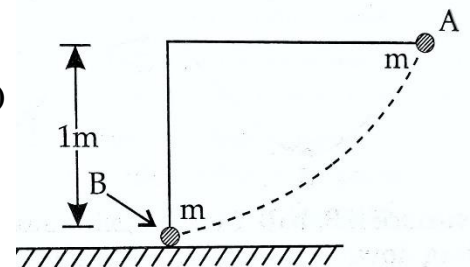
SUBJECT: PHYSICS

FM: 20

TIME: 45 MIN

### (1 MARK)

1. A ball of mass 2 kg is lifted vertically upwards through a height of 10 m. The work done against gravity is  
(a) 200 (b) 196 (c) 180 (d) 220
2. In an elastic collision between two objects  
(A) Total kinetic energy is always conserved  
(B) Total momentum is always conserved  
(C) Both kinetic energy and momentum are conserved  
(D) Neither kinetic energy nor momentum is conserved
3. A conservative force is one where:  
(A) Work done depends on the path taken  
(B) Work done is independent of the path  
(C) Force is always constant  
(D) Force increases with displacement
4. Work done in moving an object 5m in x axis is 50 J. what will be the force  
a. 10 N in y axis b. 10 N in - x axis c. 10N in +x axis d. none
5. A particle is moving in a vertical circle with a string of length 1 m. If the particle has just enough energy to complete the circle, the speed at the bottom is approximately  
(a)  $\sqrt{5g}$  (b)  $\sqrt{3g}$  (c)  $\sqrt{2g}$  (d)  $\sqrt{g}$
6. A spring is stretched by 0.05m under 20N of force. What will be the spring constant and energy stored in the spring.  
(2 MARKS)
7. A ball of mass 200g is placed at 100m from ground on a tower dropped under gravity where  $g = 10$ , find the velocity with which it will strike the ground. (2 MARKS)
8. What is elastic collision. Derive expression for final velocity after collision of two balls of masses  $m_1$  and  $m_2$  moving with velocity  $u_1$  and  $u_2$ . ( $u_1 > u_2$ ) (3MARKS)
9. The bob A of a pendulum released from horizontal to the vertical hits another bob B of the same mass at rest on a table. If the length of the pendulum is 1 m, calculate  
(a) The height to which bob A will rise after collision.  
(b) The speed with which bob B starts moving.  
Neglect the size of the bobs and assume the collision to be elastic. (3 MARKS)



### 10. (5 MARKS)

Develop a comprehensive explanation of work and energy, covering:

- (a) Definition of work and energy
- (b) Types of energy (kinetic, potential)
- (c) Work-energy theorem
- (d) Energy conservation principle
- (e) Real-world applications of work and energy concepts.