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CLASS- XI
TEST- WORK, ENERGY AND POWER

Time Allowed: 1hour 15mins

M. M 25

Date: 13/5/2020

1. A light and a heavy body have equal momentum. Which one has greater kinetic energy? (1)
 - a) The light body
 - b) The heavy body
 - c) Both have equal K.E
 - d) Data given is incomplete

2. A shell of mass m moving with velocity v suddenly breaks into 2 pieces. The part having mass $m/4$ remains stationary. The velocity of other part will be. (1)
 - a) v
 - b) $2v$
 - c) $(\frac{3}{4})v$
 - d) $(\frac{4}{3})v$

3. An engine develops 10 kW of power. How much time will it take to lift a mass of 200 kg to a height of 40 m. ($g = 10 \text{ m/s}^2$). (1)
 - a) 4s
 - b) 5s
 - c) 8s
 - d) 10s

4. State with reason whether potential energy increases or decreases:
(a) a spring is compressed (b) two dis-similar charges are brought near each other. (2)

5. The momentum of an object is doubled. How does its kinetic energy change? (2)

6. What is meant by zero work? State the conditions under which a force does no work. Give any one example. (2)

7. What are inelastic collisions? Give the characteristics of inelastic collisions. (2)
8. State and prove work-energy theorem. (3)
9. A 16 kg block moving on a frictionless horizontal surface with a velocity of 4 m/s compresses an ideal spring and comes to rest. If the force constant of the spring be 100 N/m, then how much is the spring compressed? (3)
10. Explain what is meant by potential energy of spring? Obtain an expression for it and discuss the nature of its variation. (3)
11. What are elastic collisions? Obtain an expression for velocities after elastic collision of two bodies A and B of masses m_1 and m_2 , initially moving with velocities u_1 and u_2 . What happens to the final velocities, if the masses of two bodies become equal? (5)