1. The work done by a force F acting at an angle θ to the displacement S is given by:
   A. W = FS B. W = FS sin θ
   C. W = FS cos θ D. W = F + S (C)
   Explanation : Work is the dot product of force and displacement. The formula includes the cosine of the angle between them.
2. What is the work done when a body moves in a circular path under the action of centripetal force?
   A. Positive B. Negative
   C. Zero D. Infinite (C)
   Explanation : Centripetal force is always perpendicular to displacement, hence the dot product and work are zero.
3. Which type of work is done when brakes are applied to a moving vehicle?
   A. Positive work B. Negative work
   C. Zero work
   D. Both positive and negative (B)
   Explanation : The frictional force due to brakes opposes the motion, making the angle between force and displacement 180°, resulting in negative work.
4. If two vectors are perpendicular, their scalar product is:
   A. Zero B. Maximum
   C. Equal to the product of magnitudes
   D. Undefined (A)
   Explanation : Dot product is AB cos θ. When θ = 90°, cos 90° = 0, so the product is zero.
5. A boy lifts a 120 N box to a height of 2 m. The work done is:
   A. 60 J B. 120 J
   C. 240 J D. 130 J (C)
   Explanation : Work = Force × displacement = 120 × 2 = 240 J
6. If force and displacement are parallel, the work done is:
   A. Minimum B. Negative
   C. Maximum
   D. Zero (C)
   Explanation : When θ = 0°, cos θ = 1, so W = FS, which is maximum.
7. Work done by a variable force can be calculated as:
   A. Sum of magnitudes of forces
   B. Product of average force and displacement
   C. Area under the force-displacement curve
   D. Square of displacement (C)
   Explanation : For variable force, W = ∫F(x)dx, which equals the area under the curve.
8. When a spring is stretched, the work done by the external force is:
   A. Positive B. Negative
   C. Zero
   D. Infinite (A)
   Explanation : The applied force and displacement are in the same direction, so work is positive.
9. A cyclist comes to a stop after skidding 10 m under a 200 N opposing force. Work done by the road on the cycle is:
   A. +2000 J B. –2000 J
   C. 0 J
   D. 20 J (B)
   Explanation : W = FS cos 180° = 200 × 10 × (–1) = –2000 J. Negative work stops the motion.
10. Which law ensures that the force exerted by a cycle on the road is equal and opposite to the force exerted by the road on the cycle?
    A. Law of Conservation of Energy
    B. Newton's First Law
    C. Newton's Second Law
    D. Newton's Third Law (D)
    Explanation : Action and reaction forces are equal and opposite. However, the work done need not be equal because displacement may differ.