1. The gravitational potential energy of a body of mass m at distance r from the Earth's center is:
   A. +GMm/r B. -GMm/r
   C. -GM/r D. GM/r (B)
   Explanation : By convention, potential energy is zero at infinity, so at distance r it is U = -GMm/r.
2. The work done in bringing a body of mass m from infinity to distance r from Earth's center is:
   A. Zero B. GMm/r
   C. -GMm/r D. GM/r^2 (C)
   Explanation : Work done = Change in potential energy = -GMm/r.
3. For a small height h above Earth's surface, the change in potential energy is approximately:
   A. mgRe B. mgh
   C. GMm/Re D. -mgh (B)
   Explanation : Exact expression is ΔU = GMmh/[Re(Re+h)]. For h << Re, it reduces to mgh.
4. Escape velocity is:
   A. Minimum speed required to stay in orbit
   B. Minimum velocity to escape Earth's atmosphere
   C. Minimum velocity needed to reach infinity without returning
   D. Average orbital speed of satellites (C)
   Explanation : Escape velocity is the speed at which total energy (kinetic + potential) becomes zero at infinity.
5. The escape velocity from Earth's surface is:
   A. $\sqrt{(gRe)}$ B. $\sqrt{(2gRe)}$
   C. $\sqrt{(GM/Re^2)}$ D. $\sqrt{(GM/Re)}$ (B)
   Explanation : From energy conservation, ve = $\sqrt{(2gRe)}$ = $\sqrt{(2GM/Re)}$.
6. Escape velocity on Earth's surface is approximately:
   A. 7.9 km/s B. 9.8 km/s
   C. 11.2 km/s D. 12.5 km/s (C)
   Explanation : Calculation gives ve ≈ 11.2 km/s.
7. The escape velocity from the Moon's surface is approximately:
   A. 1.2 km/s B. 2.38 km/s
   C. 3.8 km/s D. 11.2 km/s (B)
   Explanation : Using Moon's radius and gm ≈ g/6, ve ≈ 2.38 km/s.
8. Escape velocity depends on:
   A. Mass of the escaping object only
   B. Mass of the planet only
   C. Mass of both object and planet
   D. Neither object nor planet (B)
   Explanation : Escape velocity depends only on the mass and radius of the planet. Object's mass cancels out.
9. For a body near Earth's surface, escape velocity is related to orbital velocity by:
   A. ve = vorbit B. ve = 2vorbit
   C. ve = $\sqrt{2}$ vorbit
   D. ve = vorbit/$\sqrt{2}$ (C)
   Explanation : Circular orbital speed is vo = $\sqrt{(gRe)}$. Escape speed is ve = $\sqrt{(2gRe)}$ = $\sqrt{2}$ vo.
10. The Moon has almost no atmosphere because:
    A. Its gravity is too weak to hold gases
    B. It has no magnetic field
    C. Its surface is rocky
    D. It is too close to Earth (A)
    Explanation : With escape speed only ~2.38 km/s, average thermal speeds of gas molecules exceed this, so gases escape into space.