1. Which of the following correctly expresses the acceleration due to gravity at Earth's surface?
   A. $g = GM/R$ B. $g = GM/R^2$
   C. $g = G/(MR^2)$ D. $g = R^2/GM$ (D)
   Explanation : At Earth's surface, $g = GM/R^2$, where M is Earth's mass and R its radius.
2. The value of g at a height h above Earth's surface is:
   A. $g = g_s (R/(R+h))^2$
   B. $g = g_s ((R+h)/R)^2$
   C. $g = g_s (R/h)^2$
   D. $g = g_s ((R-h)/R)^2$ (D)
   Explanation : At height h, $g(h) = GM/(R+h)^2 = g_s (R/(R+h))^2$.
3. For small heights $h \ll R$, the fractional decrease in g is approximately:
   A. h/R B. 2h/R
   C. 3h/R D. h^2/R^2 (D)
   Explanation : Using binomial approximation, $\Delta g/g \approx 2h/R$ for $h \ll R$.
4. At depth d inside Earth, the acceleration due to gravity is:
   A. $g(d) = g_s$
   B. $g(d) = g_s (1 - d/R)$
   C. $g(d) = g_s (R/(R+d))^2$
   D. Zero everywhere below the surface (D)
   Explanation : Inside a uniform sphere, $g \propto r$. At depth d, $g(d) = g_s (1 - d/R)$.
5. What is the value of g at Earth's center?
   A. 9.8 m/s^2 B. GM/R^2
   C. Zero D. Infinite (C)
   Explanation : At the center, all gravitational forces cancel, making g = 0.
6. The percentage decrease in g at small height h is given by:
   A. $(h/R) \times 100\%$ B. $(2h/R) \times 100\%$
   C. $(h^2/R^2) \times 100\%$
   D. $(R/h) \times 100\%$ (B)
   Explanation : For small h, % decrease = $(\Delta g/g) \times 100 = (2h/R) \times 100\%$.
7. The percentage decrease in g at depth d is:
   A. $(d/R) \times 100\%$ B. $(2d/R) \times 100\%$
   C. $(3d/R) \times 100\%$
   D. $(d^2/R^2) \times 100\%$ (A)
   Explanation : For depth d, % decrease = $(d/R) \times 100\%$.
8. At what location is g maximum on Earth?
   A. Equator
   B. Top of Mount Everest
   C. Pole
   D. Center of the Earth (C)
   Explanation : Due to Earth's rotation and shape, g is maximum at the poles and minimum at the equator.
9. The standard mean value of g near Earth's surface is:
   A. 9.8 m/s^2 B. 9.2 m/s^2
   C. 9.9 m/s^2 D. 0 m/s^2 (A)
   Explanation : The accepted average value of g is 9.8 m/s^2.
10. Which of the following does NOT affect the value of g for a given location?
    A. Earth's mass and radius
    B. Height above Earth's surface
    C. Depth below Earth's surface
    D. Mass of the falling object (D)
    Explanation : g depends only on Earth's properties and position, not on the mass or shape of the object.