

Soil Mechanics

FUNDAMENTAL CONCEPTS

- Q.1. The ratio of void volume to total volume is called
(a) void ratio
(b) water content
(c) degree of saturation
(d) none of these
- Q.2. In a soil sample, volume of voids to volume to solid is called
(a) void ratio
(b) porosity
(c) degree of saturation
(d) none of these
- Q.3. Porosity is usually expressed in
(a) ratio
(b) decimal value
(c) percentage
(d) any of these
- Q.4. Void ratio is expressed in
(a) decimal value
(b) percentage
(c) both (a) and (b)
(d) none of these
- Q.5. Value of void ratio
(a) is always less than unity
(b) is always more than unity
(c) can be more than unity
(d) none of these
Hint: $e > 0$
Volume of voids(volume of water + volume of air)for any other medium could be zero but not for the soil, if volume of voids is zero than soil behaves like steel thus void ratio of soil will never be equal to zero.
- Q.6. The void ratio(e) of a soil can have a value/range
(a) $e \leq 0$
(b) $0 < e < 1$
(c) $0 \leq e \leq 1$
(d) $0 < e$
- Q.7. The relationship between porosity(n) and void ratio(e) is
(a) $n = 1 + e$
(b) $e = 1 + n$
(c) $n = e/(1 + e)$
(d) none of these
- Q.8. The void ratio of a soil sample is 1, the corresponding porosity of the sample is
(a) 1.5
(b) 0.5
(c) 2.00
(d) 2.5
- Q.9. The porosity of a soil sample is 20%, the void ratio is
(a) 0.20
(b) 0.80
(c) 1.00
(d) 0.25
- Q.10. The value of porosity of a soil sample in which the total volume of soil grains is equal to twice the total volume of voids would be
(a) 75%
(b) 66.66%
(c) 50%
(d) 33.33%
Hint: $V_s = 2V_v$; $e = V_v/V_s$
 $= 1/2 = 0.5$
 $n = e/(1 + e)$
- Q.11. A dry soil sample has equal amounts of solids and voids by volume. Its ratio and porosity respectively will be
(a) 1.0, 100%
(b) 0.5, 50%
(c) 0.5, 100%
(d) 1.0, 50%
Hint: $V_v = V_s$; $e = V_v/V_s = 1$
 $n = e/(1 + e)$
- Q.12. A truck can carry six cubic metres of loose earth at a void ratio of 1.4. This earth is to be excavated from a quarry where the void ratio $e = 0.9$. The volume of the earth in cubic metres which needs to be excavated would be
(a) 27/7
(b) 19/4
(c) 28/3
(d) 6
Hint: $V_1/V_2 = (1 + e_1)/(1 + e_2)$