PhD Question (Civil Engineering)

1. The relation between void ratio (e), degree of saturation (s), water content (w) and specific gravity of solids (G) is given by

(a) e+s=w+G

(b) e×s=w×G

(c) $\frac{e}{s}=\frac{w}{G}$

(d) $\frac{s+e}{w}=\frac{G+e}{s}$

2. The degree of saturation for the moist soil is about

(a) 0%

(b) 1 to 25%

(c) 25 to 50%

(d) 50 to 75%

3. Which of the following clay mineral gives maximum swelling?

(a) Kalonite

(b) Montmorillonite

(c) IIlite

(d) all of these

4. According to Pycnometer method, the specific gravity of soil solids (G) is given by

(a) G=$\frac{M_1+M_2}{M_1-M_2+M_3-M_4}$

(b) G=$\frac{M_1+M_3}{M_1+M_2-M_3-M_4}$

(c) G=$\frac{M_2-M_1}{M_2+M_4-M_1-M_3}$

(d) G=$\frac{M_1+M_2}{M_2+M_4-M_1-M_3}$

Where M_1=Mass of Pycnometer

M_2=Mass of Pycnometer and dry soil,

M_3=Mass of Pycnometer ,soil solids and water, and

M_4=Mass of Pycnometer and Water,

5. The liquidity index (in percentage) is given by

(a) $\frac{w_p - w}{Ip}$

(b) $\frac{w_L - w}{Ip}$

(c) $\frac{w_L - w_p}{I_p}$

(d) $\frac{w - w_p}{I_p}$

6. A flow net constructed to determine the seepage through an earth dam which is homogeneous but anisotropic, gave 4 flow channels and 16 equipotential drops. The coefficients of permeability in the horizontal and vertical directions are 4×10^{-7}m/s and 1×10^{-7}m/s respectively, If the storage head is 20 m, then the seepage per unit length of the dam in m^3/s, will be

(a) 5×10^{-7}

(b) 10×10^{-7}

(c) 20×10^{-7}

(d) 40×10^{-7}

7. In case of coarse grained sand having high permeability and low plasticity, 95% of consolidation occurs within…….after application of load.

(a) 1 minute

(b) 30 minutes

(c) 1 hour

(d) 2 hour

8. The relation between coefficient of consolidation (c_v), time factor (T_v),drainage path (d) and time (t) is given by

(a) $c_v = \frac{d^2.T_v}{t}$

(b) $c_v = \frac{d^2.t}{T_v}$

(c) $c_v = \frac{T_v.t}{d^2}$

(d) $c_v = \frac{T_v}{d^2.t}$