

35. If  $C_d$  = coefficient of discharge,  $C_v$  = coefficient of velocity and  $C_c$  = coefficient of contraction, then which of the following statement is correct?
- (A)  $C_c = C_d \times C_v$  (B)  $C_v = C_c \times C_d$   
 (C)  $C_d = C_v \times C_c$  (D) None of these
36. Which of the following will have a plasticity index 20?
- (A) sand (B) clay  
 (C) silt (D) compacted sand
37. What is a protective barrier constructed to enclose harbours, and to keep the harbour waters undisturbed by the effect of heavy and strong seas?
- (A) entrance lock (B) dock  
 (C) shaft (D) break water
38. Determine the total pressure on a circular plate of area of cross section  $1 \text{ m}^2$  which is placed vertically in water in such a way that the centre of the plate is 1 m below the free surface of water.
- (A) 981 N (B) 9.81 N  
 (C) 9810 N (D) 98.1 N
39. Among which of the following tests conducted for measurement of shear strength of soil, no excess pore pressure is set up at any stage of the test?
- (A) drained test (B) undrained test  
 (C) consolidated undrained test (D) quick test
40. Which of the following laws gives the diameter of a sphere which will settle at a specific terminal velocity?
- (A) Darcy's Law (B) Stoke's Law  
 (C) Hooke's Law (D) Gay – Lussac's Law
41. What is meant by optimum water content?
- (A) water content corresponding to maximum dry density  
 (B) water content corresponding to zero air voids  
 (C) water content corresponding to minimum dry density  
 (D) water content corresponding to field density
42. What is the function of a fish plate?
- (A) for fixing rails to sleepers (B) for fastening chairs to sleepers  
 (C) for fixing wooden sleepers to rail (D) to hold two rails together
43. Which among the following is pressure on a fluid below atmospheric pressure?
- (A) absolute pressure (B) gauge pressure  
 (C) vacuum pressure (D) none of these

44. Which of the following is the unit of coefficient of consolidation?  
 (A)  $\text{cm}^2/\text{sec}$  (B)  $\text{cm}/\text{sec}$   
 (C)  $\text{m}^2/\text{kN}$  (D) none of these
45. A simply supported beam of span 7 m has a point load of 3 kN at a distance of 2 m from left end A and a point load of 2 kN at a distance of 4 m from left end A. What will be the support reaction at B?  
 (A) 3 kN (B) 2.5 kN  
 (C) 2 kN (D)  $\frac{19}{7}$  kN
46. Soils with a value of  $k$  (coefficient of permeability) ranging from  $10^{-5}$  mm/sec to  $10^{-3}$  mm/sec can be classified as :  
 (A) pervious (B) semi pervious  
 (C) impervious (D) aquiclude
47. Which of the following soil samples will have grains of almost same particle size?  
 (A) well graded (B) good graded  
 (C) gap graded (D) poorly graded
48. Which among the following is the term used for change in volume of soil per unit of initial volume due to a given unit increase in pressure?  
 (A) coefficient of volume change (B) coefficient of compressibility  
 (C) coefficient of settlement (D) swelling index
49. Which of the following values, the voids ratio in soil can have theoretically?  
 (A)  $< 1$  only (B) can be less than or more than 1  
 (C)  $> 1$  only (D)  $< 0.5$
50. For what purpose stiffeners are used in a plate girder?  
 (A) to connect the flange plates to the web  
 (B) to provide web splice  
 (C) to prevent buckling of web  
 (D) to provide splice for flange plates and cover plates
51. Which of the following is a clayey soil that has never been subjected to an effective pressure greater than existing overburden pressure and which is also completely consolidated by the existing overburden pressure?  
 (A) normally consolidated soil (B) pre – consolidated soil  
 (C) under – consolidated soil (D) over consolidated soil

52. By which simple equation the hydrologic cycle may be expressed?
- (A) Precipitation = Evaporation – Run off  
 (B) Evaporation = Precipitation + Run off  
 (C) Run off = Precipitation + Evaporation  
 (D) Precipitation = Evaporation + Run off
53. Which among the following is a functional relation connecting the value of specific gravity, voids ratio, water content and degree of saturation?
- (A)  $w = \frac{eG}{S_r}$  (B)  $e = \frac{wG}{S_r}$   
 (C)  $S_r = \frac{ew}{G}$  (D)  $G = \frac{ew}{S_r}$
54. What is an impermeable formation which contain water but are not capable of transmitting or supplying a sufficient quantity?
- (A) aquifer (B) aquifuge  
 (C) perched aquifer (D) aquiclude
55. Coefficient of permeability is inversely proportional to which of the following?
- (A) viscosity (B) effective diameter  
 (C) unit weight of water (D) void ratio
56. If an auditorium has a total surface area of plaster, floor, curtains and seats equal to 160 m<sup>2</sup> and volume of auditorium is 5000 m<sup>3</sup>, what is time of reverberation in seconds according to Sabin's equation?
- (A) 3.2 seconds (B) 5.12 seconds  
 (C) 5 seconds (D) 8 seconds
57. According to Indian Standards, specific gravity of soil is the ratio of unit weight of solids to that of water at a temperature of :
- (A) 4°C (B) 27°C  
 (C) 17°C (D) 36°C
58. What is the term used for the degree of disturbance of undisturbed clay sample due to remoulding expressed as ratio of unconfined compression strength in undisturbed state to that in remoulded state, without change in water content?
- (A) sensitivity (B) thixotropy  
 (C) collapse potential (D) coefficient of structural collapse
59. Which among the following is also known as rolled steel joist?
- (A) rolled steel T section (B) rolled steel channel section  
 (C) rolled steel I section (D) rolled steel angle section

60. For shallow foundations if  $P$  is the load,  $\gamma$  is the unit weight of soil and  $\Phi$  is the angle of repose, which of the following is equal to total depth of foundation according to Rankine's formula?
- (A)  $\frac{P}{\gamma} \left( \frac{1 + \sin \Phi}{1 - \sin \Phi} \right)$  (B)  $\frac{P}{\gamma} \left( \frac{1 - \sin \Phi}{1 + \sin \Phi} \right)$   
 (C)  $\frac{P}{\gamma} \left( \frac{1 - \sin \Phi}{1 + \sin \Phi} \right)^2$  (D)  $\frac{P}{\gamma} \left( \frac{1 + \sin \Phi}{1 - \sin \Phi} \right)^2$
61. Name the level surface to which the elevations are referred :
- (A) bench mark (B) datum  
 (C) base line (D) change point
62. For no tension developed in a gravity dam, where the resultant of all forces on dam should always lie?
- (A) at toe (B) near heel  
 (C) at top (D) within the middle third of the section
63. Two bodies of masses 5.5 kg and 4.3 kg are hung to the ends of rope, passing over a smooth frictionless pulley. With what acceleration the heavier mass comes down?
- (A) 9.8 m/s<sup>2</sup> (B) 4.73 m/s<sup>2</sup>  
 (C) 80 m/s<sup>2</sup> (D) 1.2 m/s<sup>2</sup>
64. If  $W_L$  = liquid limit,  $W_P$  = plastic limit,  $W_S$  = shrinkage limit then which of the following is equal to plasticity index ( $I_P$ )?
- (A)  $W_L - W_P$  (B)  $W_P - W_L$   
 (C)  $W_L - W_S$  (D)  $W_P - W_S$
65. Among the following which equipment is not used in chain survey?
- (A) ranging rod (B) offset rod  
 (C) alidade (D) plumb bob
66. Name the end supports of the superstructure of a bridge :
- (A) abutments (B) piers  
 (C) wing walls (D) deckings
67. A body was thrown vertically down from a tower. What is the distance travelled by the body in the third second of its fall, if its initial velocity was 5.5 m/sec?
- (A) 25 m (B) 60.60 m  
 (C) 60 m (D) 30 m