1. A pendulum P has length L and the pendulum Q has the length 4L. The time period of pendulums P and Q will be in the ratio of:

(A)	1: 0.5	(B)	1:1
(C)	1:2	(D)	1:4

2. In a particular material, if the modulus of rigidity is equal to the bulk modulus, then Poisson's ratio will be:

(A)	1/8	(B)	1/4
(C)	1/2	(D)	1

3. If deflection at the free end of a uniformly loaded cantilever beam is 15 mm and slope of the deflection curve at the free end is 0.02 radians, then length of beam is:

(A)	0.8 m	(B)	1 m
(C)	1.2 m	(D)	1.5 m

4. A simply supported beam A carries a concentrated load at its mid span. Another identical beam B carries the same load but uniformly distributed over the whole span. The ratio of maximum deflection of beam A to beam B will be:

(A)	5/3	(B)	3/5
(C)	8/5	(D)	5/8

5. The approximate ratio between the strengths of cement concrete at 7 days and 28 days is:

(A)	3/4	(B)	2/3
(C)	1/2	(D)	1/3

6. The limits of percentage (%) of the longitudinal reinforcement in a column is:

(A)	0.15 to 2%	(B)	0.8 to 4%
(C)	0.8 to 6%	(D)	0.8 to 8%

7. For complete hydration of cement, water-cement ratio needed is:

(A)	< 0.25	(B)	> 0.25 but < 0.35
(C)	> 0.35 but < 0.45	(D)	> 0.45 but < 0.60

8. In limit state design, the permissible bond stress of deformed bars is more than that in plain bars by:

(A)	25%	(B)	40%
(C)	45%	(D)	60%

9. The relation between intensity of wind pressure p and wind velocity V on a roof truss is considered as:

(A)	$p \propto V$	(B)	$p \propto V^2$
(C)	$p \propto 1/V$	(D)	$p \propto V^{1/2}$

10. An I-section steel beam has overall depth of 300 mm. If flanges stresses developed at the top and bottom of the beam are 1.2 N/m^2 and 0.3 N/m^2, respectively, then depth of neutral axis from the top of beam will be

(A)	250 mm	(B)	240 mm

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	(C)	200 mm	(D)	180 mm

11.	In PERT analysis, the time estimates of activities and probability of their occurrence follow:			
	(A)	Normal distribution curve	(B)	Poisson's distribution curve
	(C)	β - distribution curve	(D)	Binomial distribution curve

12.	The time by which a particular activity can be delayed without affecting the preceding and succeeding activities is known as:			
	(A)	total float	(B)	free float
	(C)	interfering float	(D)	independent float

13.	A soil sample has properties: Liquid limit = 45%, Plastic limit = 25%, Shrinkage limit = 17%, Natural moisture content = 30%. The consistency index of soil is:			
	(A)	5/20	(B)	8/20
	(C)	13/20	(D)	15/20

14.	For an anisotropic soil, permeabilites along x- and y- directions are k_x and k_y, respectively. The effective permeability of the soil is given by:			
	(A)	$k_x + k_y$	(B)	k_x / k_y
	(C)	$(k_x + k_y)^{1/2}$	(D)	$(k_x \, k_y)^{1/2}$

15.	A soil has a discharge velocity of 6×10^7 m/s and a void ratio of 0.5, its seepage velocity is:			
	(A)	18×10^7 m/s	(B)	12×10^7 m/s
	(C)	6×10^7 m/s	(D)	3×10^7 m/s

16.	Degree of saturation of a natural soil deposit having water content 15%, specific gravity 2.5 and void ratio 0.50 is:			
	(A)	50 %	(B)	60 %
	(C)	75 %	(D)	80 %

17.	Which one of the following gives the correct decreasing order of the densities of a soil sample?			
	(A)	Saturated, submerged, wet and dry	(B)	Saturated, wet, submerged and dry
	(C)	Saturated, wet, dry and submerged	(D)	Wet, saturated, submerged and dry

18.	Quick sand is a			
	(A)	type of sand	(B)	flow condition occuring in cohesive soils
	(C)	flow condition occuring in cohesionless soils	(D)	flow condition occuring in both cohesive and cohesionless soils

19.	Degree of consolidation of a soil is directly proportional to			
	(A)	time and inversely proportional to drainage path	(B)	time and inversely proportional to square of drainage path
	(C)	drainage path and inversely proportional to time	(D)	square of drainage path and inversely proportional to time

20.	If s is the shear strength, c and ϕ are shear strength parameters, σ_n is the normal stress at failure, then Coulomb's equation for shear strength of soil is given by:

	(A)	$c = (s + \sigma_n \tan\phi)$	(B)	$c = (s - \sigma_n \tan\phi)$
	(C)	$s = (\sigma_n + c \tan\phi)$	(D)	$s = (c - \sigma_n \tan\phi)$

21.	In the plate load test for determining the bearing capacity of soil, the size of square bearing plate should be			
	(A)	less than 300 mm	(B)	between 300 mm and 750 mm
	(C)	between 750 mm and 1 m	(D)	greater than 1 m

22.	During seepage through an earth mass, the direction of seepage is			
	(A)	parallel to the equipotential lines	(B)	perpendicular to the stream lines
	(C)	perpendicular to the equipotential lines	(D)	along the direction of gravity

23.	Stoke is the unit of			
	(A)	pressure	(B)	kinematic viscosity
	(C)	dynamic viscosity	(D)	surface tension

24.	The resultant velocity at point (1, 1) for a stream function, $\psi = (x^2 - y^2)$ is:			
	(A)	2	(B)	$2\sqrt{2}$
	(C)	4	(D)	$4\sqrt{2}$

25.	The thickness of laminar boundary layer varies as:			
	(A)	$x^{4/5}$	(B)	$x^{1/2}$
	(C)	$x^{1/5}$	(D)	$x^{3/5}$

26.	The velocity distribution for turbulent flow in pipes is:			
	(A)	linear	(B)	parabolic
	(C)	cubic	(D)	logarithmic

27.	A channel carries a discharge of 30 m³/s at depth of 1 m and bed slope of 0.0009. If bed slope is 0.0001, discharge carried by the channel at the same depth will be:			
	(A)	10 m³/s	(B)	15 m³/s
	(C)	60 m³/s	(D)	90 m³/s

28.	Which of the following is used to measure discharge			
	(A)	current meter	(B)	venturimeter
	(C)	pitot tube	(D)	hotwire anemometer

29.	Water hammer in pipes is due to			
	(A)	excessive leakage of flowing liquid	(B)	bursting of pipe under high fluid pressure
	(C)	sudden stoppage of flow	(D)	hitting the pipe with a hammer

30.	The elementary profile of a gravity dam is			
	(A)	a rectangle	(B)	a trapezoidal
	(C)	an equilateral triangle	(D)	a right angle triangle

31.	Morning glory spillway is located			
	(A)	inside the body of a gravity dam	(B)	inside the reservoir
	(C)	d/s of reservoir	(D)	on one side of the dam

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32. For dynamic similarity to exist between model and prototype where both viscous and gravity forces are significant, the relationship between dynamic viscosity ratio (μ_r) and linear scale ratio (L_r) is

(A)	$\mu_r = (L_r)^{3/2}$	(B)	$\mu_r = (L_r)^{2/3}$
(C)	$\mu_r = (L_r)^{1/2}$	(D)	$\mu_r = (L_r)^{5/2}$

33. The word "unit" in the unit hydrograph refers to

(A)	unit duration of storm	(B)	unit depth of run off
(C)	unit base period of hydrograph	(D)	unit area of basin

34. If Kor depth and Kor period for rice are 190 mm and 14 days respectively, then duty at outlet will be

(A)	637 hectares/cumec	(B)	837 hectares/cumec
(C)	972 hectares/cumec	(D)	1674 hectares/cumec

35. As compared to the crest of normal portion of weir, the crest of under sluice portion of weir is kept at

(A)	lower level	(B)	higher level
(C)	same level	(D)	any of these depending on the design

36. Dissolved oxygen in streams is:

(A)	maximum at noon	(B)	minimum at noon
(C)	maximum at mid night	(D)	same throughout the day

37. In the design of storm sewers, "time of concentration" is used to determine

(A)	velocity in the sewer	(B)	time of travel
(C)	rainfall intensity	(D)	area served by the sewer

38. As per IRC, the maximum limit of super elevation for mixed traffic in plain terrains is

(A)	1 in 15	(B)	1 in 12.5
(C)	1 in 10	(D)	equal to camber

39. For a broad gauge line with (M + 7) sleeper density (M is the standard length of rail), the number of sleepers per rail length are

(A)	18	(B)	19
(C)	20	(D)	21

40. The representative fraction of 1/2500 means that the scale 1 cm is equal to

(A)	0.25 m	(B)	2.5 m
(C)	25 m	(D)	250 m

Civil

Q1:	C
Q2:	A
Q3:	B
Q4:	C
Q5:	B
Q6:	C
Q7:	C
Q8:	D
Q9:	B
Q10:	B
Q11:	C
Q12:	D
Q13:	D
Q14:	D
Q15:	A
Q16:	C
Q17:	C
Q18:	C
Q19:	B
Q20:	B
Q21:	B
Q22:	C
Q23:	B
Q24:	B
Q25:	B
Q26:	D
Q27:	A

Q28:	B
Q29:	C
Q30:	D
Q31:	B
Q32:	A
Q33:	B
Q34:	A
Q35:	A
Q36:	A
Q37:	C
Q38:	A
Q39:	C
Q40:	C