Module Name : PhD Civil Engineering-E
Exam Date : 18-Sep-2020 Batch : 12:30-14:30

Sr. No.	Client Question ID	Question Body and Alternatives	Marks	Negative Marks
Objective Question				
1	1	Clay exhibits negative surface charge characteristics because of the A1 : Presence of Silica and Aluminium ions A2 : Cation exchange capacity A3 : Isomorphous substitution A4 : Surface charge property	4.0	1.00
Objective Question				
2	2	Assign suitable particle classification symbol as per USCS for the following soil gradation: Sand=65%; Silt=23%; Clay=12%; C_u=3.5; C_c=1.95 A1 : Well graded sand A2 : Poorly graded sand A3 : Well graded gravel A4 : Poorly graded gravel	4.0	1.00
Objective Question				
3	3	If the water content of a fully saturated soil is 100%, then void ratio of the sample is A1 : Less than specific gravity of soils A2 : Equal than specific gravity of soils A3 : More than specific gravity of soils A4 : Independent of specific gravity of soils	4.0	1.00
Objective Question				
4	4	The active pressure caused by chesionless backfill on a smooth vertical retaining wall may be reduced by A1 : Compacting the backfill	4.0	1.00

		A2 : providing a surcharge load on the backfill A3 : Saturating the backfill with water A4 : none of these		
Objective Question				
5	5	SPT ‘N’ value depends on A1 : Relative density A2 : Over burden pressure A3 : Soil type A4 : All of these	4.0	1.00
Objective Question				
6	6	For a purely cohesive soil, what will be the bearing capacity at ground surface for a circular footing as per Terzaghi’s analysis? A1 : 5.14.c A2 : 6.0.c A3 : 4.0 c A4 : 5.62 c	4.0	1.00
Objective Question				
7	7	At similar depth, unit skin friction is higher for A1 : Cast-in-situ piles A2 : Driven piles A3 : Bored piles A4 : driven cast-in-situ piles	4.0	1.00
Objective Question				
8	8	Pressure bulb indicates	4.0	1.00

		A1 : Depth of exploration A2 : type of loading A3 : Intensity of loading A4 : Zone of influence		
Objective Question				
9	9	Generally, bearing capacity of soil is determined based on A1 : Shear failure of soil A2 : Settlement of soil A3 : Footing geometry A4 : Ultimate load	4.0	1.00
Objective Question				
10	10	The appropriate field test to determine the undrained shear strength of soft clay is A1 : Plate load test A2 : Static cone penetration test A3 : Standard penetration test A4 : Vane shear test	4.0	1.00
Objective Question				
11	11	If the effective shear strength parameters of a soil are c'=10 kPa and ϕ'=45°, the shear strength on a plane within the saturated soil mass at a point where the total normal stress is 300 kPa and pore pressure is 150 kPa will be A1 : 80 kPa A2 : 120 kPa A3 : 160 kPa	4.0	1.00

		A4 : 200 kPa		
Objective Question				
12	12	A saturated clay stratum draining at both the top and bottom undergoes 50 percent consolidation in 16 years under an applied load. If an additional drainage layer were present at the middle of the clay stratum, 50 percent consolidation would occur in A1 : 16 years A2 : 8 years A3 : 4 years A4 : 2 years	4.0	1.00
Objective Question				
13	13	If the ruling gradient on any highway is 3%, the gradient provided on the curve of 300 meter radius, is A1 : 2.00% A2 : 2.50% A3 : 3.00% A4 : 4.00%	4.0	1.00
Objective Question				
14	14	The convexity provided to the carriageway between the crown and edge of the pavement, is known as A1 : Superelevation A2 : camber A3 : Height of the pavement A4 : None of these.	4.0	1.00
Objective Question				
15	15	If the width of carriage way is 12.5 meters, outer edge 50 cm higher than the inner edge, the required super elevation is A1 : 50cm A2 : 1 in 25	4.0	1.00

		A3 : 1 in, 400 A4 : 1 in 40		
Objective Question				
16	16	For a vehicle moving with a speed of 80 km per hour, the brake reaction time, in ordinary cases, is A1 : 1 sec A2 : 1.5 sec A3 : 2.0 sec A4 : 2.5 sec	4.0	1.00
Objective Question				
17	17	The drain which is provided parallel to roadway to intercept and divert the water from hill slopes is known as A1 : Sloping drain A2 : catchment drain A3 : Side drain A4 : cross drain	4.0	1.00
Objective Question				
18	18	Which of the following represents a carpet of sand-bitumen mix without coarse aggregates? A1 : Mastic asphalt A2 : Bituminous asphalt A3 : Sheet asphalt A4 : Bituminous concrete	4.0	1.00
Objective Question				
19	19	When the bituminous surfacing is done on already existing black top road or over the existing cement concrete road, the type of treatment to be given is A1 : Seal coat	4.0	1.00

		A2 : Tack coat A3 : Prime coat A4 : Spray of emulsion		
Objective Question				
20	20	Maximum daily traffic capacity of bituminous pavement is A1 : 500 tonnes per day A2 : 1000 tonnes per day A3 : 1500 tonnes per day A4 : 2000 tonnes per day	4.0	1.00
Objective Question				
21	21	Tie bars in cement concrete pavements are at A1 : Expansion joint A2 : Contraction joint A3 : Warping joint A4 : Longitudinal joint	4.0	1.00
Objective Question				
22	22	The group index for a soil, whose liquid limit is 40 percent, plasticity index is 10 percent and percentage passing 75 microns IS sieve is 35, is A1 : 0 A2 : 6 A3 : 5 A4 : 7	4.0	1.00
Objective Question				
23	23	Softening point of bitumen to be used for road construction at a place where maximum temperature is 40 ^{o}C should be	4.0	1.00

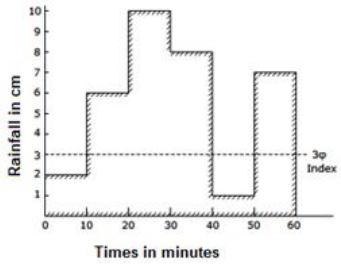
		A1 : Less than 40 ^{o}C A2 : greater than 40 ^{o}C A3 : Equal to 40 ^{o}C A4 : none of these		
Objective Question				
24	24	In CBR test, the value of CBR is calculated at A1 : 2.5 mm penetration only A2 : 5.0 mm penetration only A3 : 7.5 mm penetration only A4 : Both 2.5 mm and 5.0 mm penetrations	4.0	1.00
Objective Question				
25	25	Maximum number of vehicles can be parked with A1 : Parallel parking A2 : 30^{o} angle parking A3 : 45^{o} angle parking A4 : 90^{o} angle parking	4.0	1.00
Objective Question				
26	26	The reduced bearing of a 10 m long line is N30^{o}E. The departure of the line is A1 : 10.00 m A2 : 8.66 m A3 : 7.52 m A4 : 5.00 m	4.0	1.00
Objective Question				

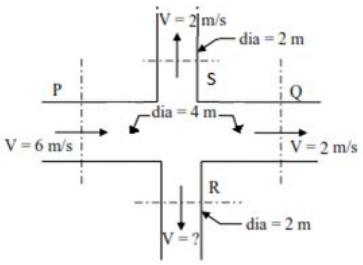
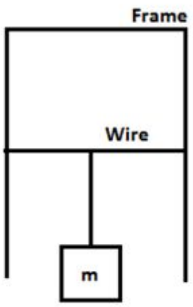
27	27	The combined correction due to curvature and refraction (in m) for a distance of 1 km on the surface of Earth is A1 : 0.0673 A2 : 0.673 A3 : 7.63 A4 : 0.763	4.0	1.00
Objective Question				
28	28	The latitude and departure of a line AB are +78 m and -45.1 m, respectively. The whole circle bearing of the line AB is: A1 : 30^o A2 : 150^o A3 : 210^o A4 : 330^o	4.0	1.00
Objective Question				
29	29	The plan of a map was photo copied to a reduced size such that a line originally 100 mm, measures 90 mm. The original scale of the plan was 1 : 1000. The revised scale is A1 : 1:900 A2 : 1:1111 A3 : 1:1121 A4 : 1:1221	4.0	1.00
Objective Question				
30	30	The alum, when added as a coagulant in water A1 : Does not require alkalinity in water for flocculation? A2 : Does not affect pH value of water A3 : Increases pH of water A4 : Decreases pH of water	4.0	1.00

Objective Question				
31	31	In water treatment, rapid gravity filters adopted to remove A1 : Dissolved organic substances A2 : dissolved solids and dissolves gases A3 : Floating solids and dissolved inorganic solids A4 : bacterial and colloidal solids	4.0	1.00
Objective Question				
32	32	Disinfection efficiency is A1 : Reduced at higher pH value of water A2 : unaffected by pH value of water A3 : Increased at higher pH value of water A4 : highest at pH value equal to 7	4.0	1.00
Objective Question				
33	33	The most suitable section of sewer in separate sewage system is A1 : Rectangular section A2 : circular section A3 : Spherical section A4 : square section	4.0	1.00
Objective Question				
34	34	Composting and lagooning are the methods of A1 : Sludge digestion A2 : Sludge disposal A3 : Sedimentation	4.0	1.00

		A4 : Filtration		
Objective Question				
35	35	Which of the following methods is better for the solid waste problem? A1 : Recycling A2 : Landfilling A3 : Both Recycling and Landfilling A4 : None of these	4.0	1.00
Objective Question				
36	36	Which of the following gas is produced from landfill wastes? A1 : Biogas A2 : Natural gas A3 : Liquefied petroleum gas A4 : All of these	4.0	1.00
Objective Question				
37	37	The working conditions in Imhoff tank are A1 : Aerobic only A2 : anaerobic only A3 : Aerobic in lower compartment and anaerobic in upper compartment A4 : Anaerobic in lower compartment and aerobic in upper compartment	4.0	1.00
Objective Question				
38	38	In trickling filter, B.O.D. is reduced to A1 : 30 to 40% A2 : 40 to 60% A3 60 to 80%	4.0	1.00

		: A4 : 80 to 90%		
Objective Question				
39	39	What is the settling velocity of the particle if its diameter is 2 x 10^{-3} cm. Given G = 2.65, viscosity= 8 x 10^{-3} cm^2/Sec? A1 : 0.01cm/Sec A2 : 0.13cm/Sec A3 : 0.24cm/Sec A4 : 0.36cm/Sec	4.0	1.00
Objective Question				
40	40	Range of displacement efficiency in the plain sedimentation tank is _____ A1 : 0.25-0.5 A2 : 0.1-0.2 A3 : 0.5-0.8 A4 : 0.3-0.6	4.0	1.00
Objective Question				
41	41	Detention time for a circular tank is given by _____ A1 : t = D (D + 0.785H) /Q A2 : t = D (0.1D + 0.785H) /Q A3 : t = D^2 (0.01D + 0.785H) A4 : t = D^2 (0.01D + 0.785H) /Q	4.0	1.00
Objective Question				
42	42		4.0	1.00

		The rate of rainfall for successive 10 minute periods of a 60 minute duration storm, are shown in the below figure. If the value of φ index is 3 cm/hour, the runoff will be  A1 : 2 cm A2 : 3 cm A3 : 4 cm A4 : 5 cm		
Objective Question				
43	43	A watershed got transformed from rural to urban over a period of time. The effect of urbanization on storm runoff hydrograph from the watershed is to A1 : Decrease the volume of runoff A2 : Increase the time to peak discharge A3 : Decrease the time base A4 : decrease the peak discharge	4.0	1.00
Objective Question				
44	44	A person standing on the bank of a canal drops a stone on the water surface. He notices that the disturbance on the water surface is not traveling up-stream. This is because the flow in the canal is A1 : Sub-critical A2 : Super-critical A3 : Steady A4 : Uniform	4.0	1.00
Objective Question				
45	45		4.0	1.00

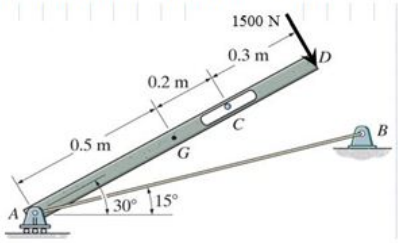
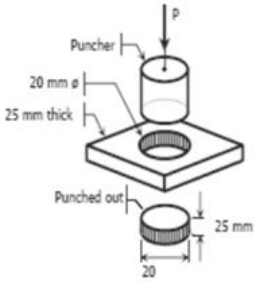
		The circular water pipes shown in the sketch are flowing full. The velocity of flow (in m/s) in the branch pipe "R" is  A1 : 14 A2 : 4 A3 : 28 A4 : 3		
Objective Question				
46	46	In a 5 m wide rectangular channel, the velocity 'u' distribution in the vertical direction y is given by $u=1.25y^{1/6}$. The distance y is measured from the channel bed. If the flow depth is 2 m, the discharge per unit width of the channel is A1 : 2.40 $m^3/s/m$ A2 : 3.27 $m^3/s/m$ A3 : 2.80 $m^3/s/m$ A4 : 12.02 $m^3/s/m$	4.0	1.00
Objective Question				
47	47	A soap film is trapped between a frame and a wire of length 10 cm as shown.If the surface tension is given as 0.004905 N/m, what will be the value of m (in mg) such that the wire remains in equilibrium?  A1 : 0.1 A2 1	4.0	1.00

		: A3 : 10 A4 : 100		
Objective Question				
48	48	A rectangular channel 6.0 m wide carries a discharge of 16.0 m^3/s under uniform flow condition with normal depth of 1.60 m. Manning's 'n' is 0.015.A hump is to be provided on the channel bed. The maximum height of the hump without affecting the upstream flow condition is A1 : 0.50 m A2 : 0.40 m A3 : 0.30 m A4 : 0.20 m	4.0	1.00
Objective Question				
49	49	For a body completely submerged in a fluid, the centre of gravity (G) and centre of Buoyancy (O) are known. The body is considered to be in stable equilibrium: A1 : O does not coincide with the centre of mass of the displaced fluid A2 : G coincides with the centre of mass of the displaced fluid A3 : O lies below G A4 : O lies above G	4.0	1.00
Objective Question				
50	50	Ordinates of a 1-hour unit hydrograph at 1 hour intervals, starting from time t = 0, are 0, 2, 6, 4, 2, 1 and 0 m^3/s. Ordinate of a 3-hour unit hydrograph for the catchment at t = 3 hours is A1 : 2.0 m^3/s A2 : 3.0 m^3/s A3 : 4.0 m^3/s A4 : 5.0 m^3/s	4.0	1.00
Objective Question				
51	51		4.0	1.00

		The runoff is affected by A1 : Type of precipitation A2 : Rain intensity and duration of rainfall A3 : Rain distribution and soil moisture deficiency A4 : All of these		
Objective Question				
52	52	What is the hydraulic radius for a rectangular channel section with depth y and width 5y? A1 : y/2 A2 : 5y/7 A3 : y A4 : 7y/5	4.0	1.00
Objective Question				
53	53	The purpose of reinforcement in prestressed concrete is A1 : To provide adequate bond stress A2 : To resist tensile stresses A3 : To impart initial compressive strength A4 : All of these	4.0	1.00
Objective Question				
54	54	What kind of stresses gets developed of a material is allowed to expand freely due to heating A1 : Thermal stresses A2 : tensile stress A3 : Compressive stress A4 : no stress develops	4.0	1.00

Objective Question				
55	55	The maximum strain energy that can be stored in a body is known as A1 : Resilience A2 : Proof resilience A3 : Modulus of resilience A4 : Toughness	4.0	1.00
Objective Question				
56	56	In a loaded beam, the point of contraflexture occurs at a section where A1 : Bending moment is maximum A2 : Bending moment is zero or changes sign A3 : Shearing force is maximum A4 : Shearing force is minimum	4.0	1.00
Objective Question				
57	57	The shape of the bending moment diagram over the length of a beam, having no external load, is always A1 : Linear A2 : parabolic A3 : Cubical A4 : Circular	4.0	1.00
Objective Question				
58	58	The minimum number of rivets for the connection of a gusset plate, is A1 : 1 A2 : 2 A3 : 3	4.0	1.00

		A4 : 4		
Objective Question				
59	59	The slenderness ratio of a vertical column of a square cross-section of 2.5 cm sides and 300 cm length is A1 : 200 A2 : 240 A3 : 360 A4 : 500	4.0	1.00
Objective Question				
60	60	The algebraic sum of moments of the forces forming a couple about any point in their plane is A1 : Equal to the moment of the couple A2 : Constant A3 : Both of above are correct A4 : None of these	4.0	1.00
Objective Question				
61	61	The deformation of a bar under its own weight compared to the deformation of same body subjected to a direct load equal to weight of the body is A1 : Same A2 : Double A3 : Half A4 : Four times	4.0	1.00
Objective Question				
62	62	When two plates are butt together and riveted with cover plates with two rows of rivets, the joint is known as A1 : Lap joint A2 : Butt joint	4.0	1.00

		A3 : Single riveted single cover butt joint A4 : Double riveted double cover butt joint		
Objective Question				
63	63	An inclined beam as shown in the figure below has a mass of 120 kg and centre of gravity at G. The beam is supported by a roller at A, cable AB, and a smooth peg in a slot at C. A 1500 N force is perpendicular to the beam. Calculate the reaction force at A?  A1 : 2781 A2 : 193.9 A3 : 709.7 A4 : 209.3	4.0	1.00
Objective Question				
64	64	What force is required to punch a 20 mm diameter hole in a plate that is 25 mm thick? The shear strength is 350 MN/m².  A1 : 550 kN A2 : 450 kN A3 : 400 kN A4 : 500kN	4.0	1.00
Objective Question				

65	65	Modulus of rigidity is valid within A1 : Elastic limit A2 : Plastic limit A3 : Elasto-plastic limit A4 : None of these	4.0	1.00
Objective Question				
66	66	Which of the following materials has highest Poisson's ratio? A1 : Steel A2 : Soil A3 : Concrete A4 : Rubber	4.0	1.00
Objective Question				
67	67	A rectangular bar having a cross section area 10000 mm^2 is subjected to an axial load of 20 kN. Determine the normal stress on a section which is inclined at an angle of 30^o with the normal cross section of the bar. A1 : 0.5 MPa A2 : 1.0 MPa A3 : 1.5 MPa A4 : 2.0 MPa	4.0	1.00
Objective Question				
68	68	The maximum shear stress by Mohr's circle is equal to the A1 : Diameter of the circle A2 : Radius of the circle A3 : Half the radius A4 1/4 of the radius	4.0	1.00

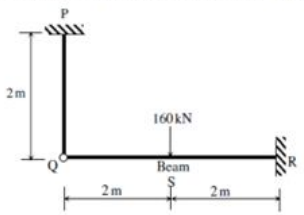
		:		
Objective Question				
69	69	The maximum stress induced in a body due to suddenly applied load is ____the stress induced when the same load is applied gradually A1 : Equal A2 : twice A3 : thrice A4 : four times	4.0	1.00
Objective Question				
70	70	The ratio of section modulus of circular to rectangular section is A1 : πd/16b A2 : 2πd/16b A3 : 3πd/16b A4 : πd/4b	4.0	1.00
Objective Question				
71	71	Crash project duration is obtained by summing the A1 : Normal durations for all the activities A2 : Crash durations for all activities A3 : Crash durations for all the activities along the critical path obtained by taking into account the normal duration for all the activities A4 : Crash durations for all the activities along the critical path obtained by taking into account the crash duration for all the activities	4.0	1.00
Objective Question				
72	72	In PERT analysis, the time estimates of activities and probability of their occurrence follow A1 : Normal distribution curve A2 : Poisson's distribution curve A3 Beta distribution curve	4.0	1.00

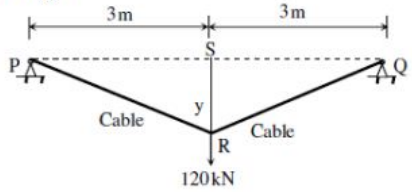
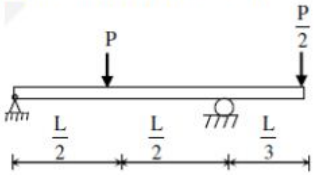
		: A4 : None of these		
Objective Question				
73	73	If an activity has its optimistic, most likely and pessimistic times as 2,3 and 7 respectively, then its expected time and variance are_____ A1 : 3.6 and 5/6 A2 : 5 and 25/36 A3 : 3.5 and 25/36 A4 : 4 and 5/6	4.0	1.00
Objective Question				
74	74	In alkali silica reaction, alkali hydroxides react with A1 : Silica A2 : Aggregates A3 : Oxides A4 : Cement	4.0	1.00
Objective Question				
75	75	The percentage composition of C_2S in ordinary Portland cement is A1 : 25-50 A2 : 20-45 A3 : 5-12 A4 : 6-12	4.0	1.00
Objective Question				
76	76	High carbon content in steel causes A1 : Decrease in tensile strength but increase in ductility A2 Increase in tensile strength but decrease in ductility	4.0	1.00

		: A3 : Decrease in both tensile strength and ductility A4 : Increase in both tensile strength and ductility		
Objective Question				
77	77	Admixtures that cause early setting and hardening of concrete are called A1 : Accelerators A2 : Workability admixtures A3 : Retarders A4 : Air entraining agents	4.0	1.00
Objective Question				
78	78	For reinforced concrete section, the shape of shear stress diagram is A1 : Parabolic A2 : Rectangular A3 : Parabolic above neutral axis and rectangular below neutral axis A4 : Rectangular above neutral axis and parabolic below neutral axis	4.0	1.00
Objective Question				
79	79	If the permissible stress in steel in tension is 140 MPa, then the depth of neutral axis for a single reinforced rectangular balanced section is A1 : 0.35d A2 : 0.40d A3 : 0.45d A4 : Dependent on grade of concrete	4.0	1.00
Objective Question				
80	80	According to IS:456-1978, column or strut is the member whose effective length is greater than A1 The least lateral dimension	4.0	1.00

		: A2 : 2 times the least lateral dimension A3 : 3 times the least lateral dimension A4 : 4 times the least lateral dimension		
Objective Question				
81	81	Lap length in compression shall not be less than_____times the diameter of the bar A1 : 15 A2 : 20 A3 : 24 A4 : 30	4.0	1.00
Objective Question				
82	82	The ratio of permissible stress in direct compression and bending compression is A1 : Less than 1 A2 : between 1 and 1.5 A3 : Between 1 and 2.0 A4 : greater than 2	4.0	1.00
Objective Question				
83	83	The main reason for providing number of reinforcing bars at a support in a simply supported beam is to resist in that zone A1 : Compressive stress A2 : shear stress A3 : Bond stress A4 : tensile stress	4.0	1.00
Objective Question				
84	84	What is the static indeterminacy of a beam having both ends fixed if the beam can undergo axial deformation?	4.0	1.00

		A1 : 2 A2 : 0 A3 : 1 A4 : 3		
Objective Question				
85	85	The symmetry of stress tensor can be correlated with which theorem of structural analysis. A1 : Castigliano's first theorem A2 : Maxwell's reciprocal principle A3 : Castigliano's second theorem A4 : Saint Venant theorem	4.0	1.00
Objective Question				
86	86	A simply supported reinforced concrete beam of length 10 m sags while undergoing shrinkage. Assuming a uniform curvature of 0.004 /m along the span, the maximum deflection (in m) at mid-span is A1 : 0.05 A2 : 0.005 A3 : 0.0005 A4 : 0.004	4.0	1.00
Objective Question				
87	87	What angle maximum shear stress plane makes with any of the principal planes in case of the plane stress condition? A1 : 180^o A2 : 90^o A3 : 45^o A4 : 0^o	4.0	1.00

Objective Question				
88	88	The polar moment of inertia (in cm^4) for a rectangular cross section having width, 2 cm and depth 6 cm is? A1 : 22 A2 : 44 A3 : 20 A4 : 40	4.0	1.00
Objective Question				
89	89	The modulus of elasticity, E=5000 $\sqrt{f_{ck}}$, where f_{ck} is the characteristic compressive strength of concrete, specified in IS:456-2000 is based on? A1 : Tangent modulus A2 : Initial tangent modulus A3 : Secant modulus A4 : Chord modulus	4.0	1.00
Objective Question				
90	90	What nature of stress governs the side face reinforcement in deep beams? A1 : Shear stress A2 : Axial normal stress A3 : Bending stress A4 : None of these	4.0	1.00
Objective Question				
91	91	The axial load in the member PQ (in kN) for the arrangement shown in figure is?  	4.0	1.00

		A1 : 50 A2 : 55 A3 : 65 A4 : 0		
Objective Question				
92	92	What is the tension (in kN) in a 10 m long cable, shown in the figure, neglecting its self-weight  A1 : 120 A2 : 75 A3 : 60 A4 : 45	4.0	1.00
Objective Question				
93	93	A prismatic beam (as shown below) has plastic moment capacity of Mp. Define the collapse load P of the beam  A1 : 2 Mp/L A2 : 4 Mp/L A3 : 6 Mp/L A4 : 8 Mp/L	4.0	1.00
Objective Question				
94	94	The Von-Mises criteria of yield for isotropic metals is based on	4.0	1.00

		A1 : Maximum strain energy A2 : Maximum shear stress A3 : Maximum distortional energy A4 : Maximum principal stress		
Objective Question				
95	95	Equilibrium method of indeterminate system analysis is also known as A1 : Compatibility method A2 : Stiffness approach A3 : Force approach A4 : Flexibility approach	4.0	1.00
Objective Question				
96	96	To control deflection, what limit is specified by IS 456:2000 for span to effective depth ratio of cantilever beam having a length less than 10 m A1 : 7 A2 : 10 A3 : 26 A4 : 20	4.0	1.00
Objective Question				
97	97	The criterion of lateral torsional buckling is specified for which structural member as per IS 800:2007 A1 : Column A2 : Base plate A3 : Tension members A4 : Beam	4.0	1.00

Objective Question				
98	98	A column of height h with a rectangular cross section of size (a x 2a) has a buckling load of P. If the cross section dimensions are changed to (0.5a x 3a) and height is changed to 1.5h, the buckling load of the column will be A1 : P/4 A2 : P/2 A3 : P/12 A4 : P	4.0	1.00
Objective Question				
99	99	Assuming there is no possibility of shear buckling of web, the maximum reduction permitted by IS 800:2007 in the low-shear design bending strength of a semi-compact steel section due to high shear is A1 : 25% A2 : 0% A3 : 50% A4 : 10%	4.0	1.00
Objective Question				
100	100	What does plane section remains plane after deformation imply in bending theory? A1 : Only longitudinal stress is present A2 : Linear strain variation A3 : Linear stress variation A4 : No shear deformation	4.0	1.00