MADE EASY

India's Best Institute for IES, GATE & PSUs

Test Centres: Delhi, Hyderabad, Bhopal, Jaipur, Bhubaneswar, Pune, Kolkata

ESE 2024 : PRELIMS EXAM
CLASSROOM TEST SERIES

CIVIL ENGINEERING | Test No. 6

BOOKLET SERIES
A

Section A : Design of Steel Structure + Surveying and Geology

Section B : Solid Mechanics - 1

Section C : Geo-Technical & Foundation Engineering-2 + Environmental Engineering-2

Duration: 1½ hrs.   Maximum Marks: 150

Read the following instructions carefully

1. Immediately after the commencement of the examination, you should check that this booklet **does not** have any unprinted or torn or missing pages or items etc. If so, get it replaced by a complete test booklet.

2. Encode clearly the test booklet series **A, B, C** or **D** as the case may be in the appropriate place in the answer sheet.

3. You have to enter your Roll Number on the Test Booklet in the Box provided alongside.
   DO NOT write **anything else** on the Test Booklet.

4. There are four alternatives for the answer to every question. For each question for which a wrong answer has been given by the candidate, **one-third (0.33)** of the marks assigned to that question will be deducted as penalty.

5. Use of Calculator is not permitted.

6. All items carry equal marks. Attempt **ALL** items. Your total marks will depend **Only** on the number of correct responses with corresponding reduction for wrong answers marked by you.

7. Before you proceed to mark in the Answer Sheet the response to various items in the Test Booklet, you have to fill in some particulars in the Answer Sheet as per instructions sent to you with your admission Certificate.

8. After you have completed filling in all your responses on the Answer Sheet and the examination has concluded, you should hand over to invigilator **Only the Answer Sheet**. You are permitted to take away with you the Test Booklet.

DO NOT OPEN THIS BOOKLET UNTIL YOU ARE ASKED TO DO SO

For any query write to us, at: **info@madeeasy.in**

Section A : Design of Steel Structure + Surveying and Geology

Q.1 Consider the following statements:
1. Margin of safety is defined for ductile materials.
2. In plastic analysis, the effect of strain hardening is neglected.
3. The design of steel element is a stress controlled approach.

Which of the above statements are correct?
(a) 1 and 2 only   (b) 2 and 3 only
(c) 1 and 3 only   (d) 1, 2 and 3

Q.2 A portal frame is shown in figure below with vertical and lateral loads. All members have the same plastic moment of resistance M_P. The ratio of W_1 to W_2 for beam and sway mechanism respectively is:
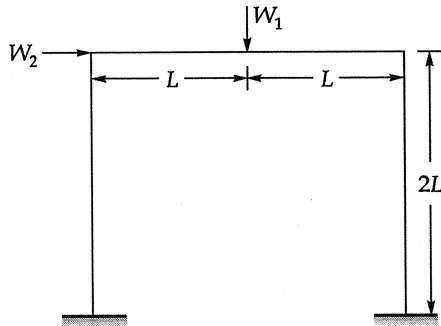
(a) 1.0   (b) 1.5
(c) 2.0   (d) 2.5

Q.3 The minimum ratio of thickness of element in compression, in terms of its outstanding length for a flexural member has been specified to prevent:
(a) Fracture
(b) Bending failure
(c) Local buckling failure
(d) Tension failure

Q.4 The welding notation for the welding details shown in figure is_____.
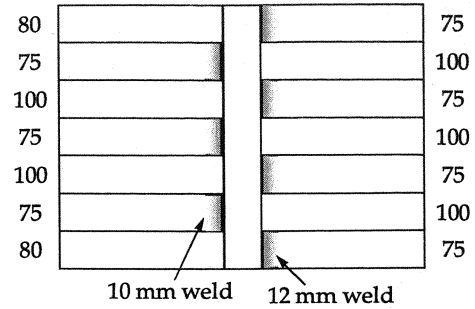
(a)

(b)

(c)

(d)

Q.5 What is the maximum number of 22 mm diameter bolts that can be accommodated in a single row on a 200 mm wide flat strip used as one of the structural elements involved in the process?
(a) 2   (b) 3
(c) 4   (d) 5

Q.6 If a steel rod of 20 mm diameter has been used as hanger bar, then what is the maximum permitted length of the hanger bar? The permissible slenderness ratio is 160.
(a) 800 mm   (b) 900 mm
(c) 725 mm   (d) 1750 mm

Q.7 A steel column in a multi-storeyed building carries an axial load of 200 kN. It is built up of two ISMC 350 channels connected by lacing. The lacing will be designed to carry a load of
(a) 2.5 kN   (b) 5 kN
(c) 10 kN   (d) 12.5 kN

Q.8 If the cost of purlins per unit area is Rs. 40 and the cost of roof covering per unit area is Rs. 25, then cost of trusses per unit area for an economical spacing of the roof truss is
(a) Rs. 90   (b) Rs. 85
(c) Rs. 105   (d) Rs. 65

Q.9 A propped cantilever beam as shown in figure has a plastic moment capacity of M_P.
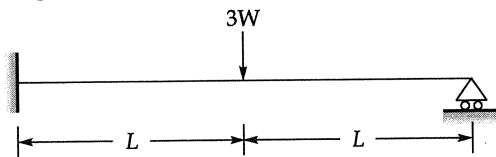
The value of W at collapse will be

(a) $\dfrac{M_P}{L}$ (b) $\dfrac{2M_P}{L}$

(c) $\dfrac{0.5M_P}{L}$ (d) $\dfrac{3M_P}{L}$

Q.10 Which of the following is the imperfection factor for the buckling curve 'c'?
(a) 0.21   (b) 0.34
(c) 0.49   (d) 0.76

Q.11 Consider the following statements:
Prying forces can be reduced by:
1. Increasing the end distance.
2. Decreasing the end distance.
3. Increasing the distance of the bolt from half the root radius for a rolled section.
Which of the above statement(s) is/are correct?
(a) 2 only   (b) 1 only
(c) 2 and 3 only   (d) 1 and 3 only

Q.12 A bracket is attached to flange of column as shown in figure. What is the maximum force in the bolt?
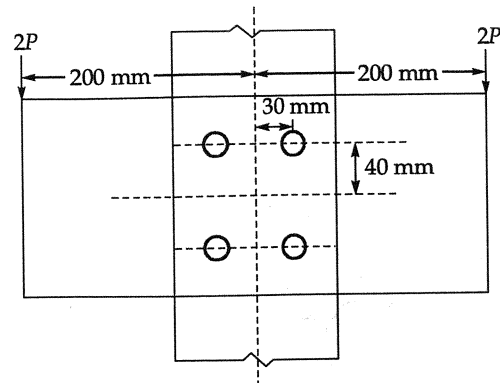
(a) P (b) $\dfrac{P}{2}$

(c) $2P$ (d) $4P$

Q.13 The top chord of a roof truss is inclined at an angle of 21°. The live load to be considered for the design is
(a) 450 N/m²   (b) 510 N/m²
(c) 530 N/m²   (d) 710 N/m²

Q.14 What is the wind pressure for the design of a roof truss if basic wind speed is 50 m/s and k_1, k_2 and k_3 are 1, 0.90 and 1 respectively?
(a) 1215 N/m²   (b) 1175 N/m²
(c) 1316 N/m²   (d) 1500 N/m²

Q.15 In a situation where torsion is dominant, which one of the following is the desirable section?
(a) Channel section
(b) I-section
(c) Box type section
(d) Angle section

Q.16 If a gantry girder section is subjected to vertical loads and horizontal thrust simultaneously, then the allowable stresses are
(a) increased by 10%
(b) decreased by 10%
(c) increased by 33.33%
(d) decreased by 33.33%

Q.17 Match **List-I** (Type of sections) with **List-II** (Shape factor) and select the correct answer using the codes given below the lists:

List-I		List-II	
A.	Rectangular section	1.	1.12
B.	I-section	2.	1.5
C.	Circular section	3.	1.7
D.	Triangular section	4.	2.34

Codes:

	A	B	C	D
(a)	1	2	3	4
(b)	1	3	2	4
(c)	2	1	3	4
(d)	2	4	3	1

Q.18 What is the maximum size of fillet weld at a rounded edge for a 12 mm thick plate?
(a) 6.5 mm   (b) 10.5 mm
(c) 16 mm   (d) 9 mm

Q.19 The length of a line is recorded as 30 m with a tape hanging in catenary at a tension of 100 N and at a temperature of 22°C. Tape had been previously standardized in catenary at a tension of 50 N at the same temperature. This line is measured in a city situated at 2000 m elevation above MSL. The tape has a cross-sectional area of 4 mm² and modulus of elasticity of tape material is 200 GPa. Correction in length of line if it is reduced to MSL is
(a) 7.5 mm   (b) 9.8 mm
(c) 3.4 mm   (d) 6.5 mm

Q.20 Sensitivity of a spirit level is defined as
(a) Error in the reading on a staff held at 100 m per one division.
(b) Size of the bubble in the tube.
(c) Angle by which the telescope is turned when the bubble becomes off-centre by one division.
(d) Number of divisions by which the telescope turns when telescope is turned by one second.

Q.21 The bearing of the Sun at noon was measured with a compass and found to be 3°30′. If the magnetic bearing of a line AB was also measured and found to be S56°30′W, then the true bearing of this line is,
(a) S60° W   (b) S53° W
(c) S50° W   (d) S63° W

Q.22 The parallax difference between the top and bottom of a building given that the mean base length in the photograph is 102.5 mm, the flying height during exposure is 1600 m, the focal length of the camera lens is 200 mm and the height of building is 30 m, is
(a) 1.96 mm   (b) 2.05 mm
(c) 1.75 mm   (d) 2.25 mm

Q.23 If the distance between two stations is 980 m, then combined angular correction in the angle of elevation for curvature and refraction is:
[Take $R \sin 1'' = 30.91$ and coefficient of refraction = 0.075, R is radius of earth in m]
(a) 31.77″   (b) 13.47″
(c) 2.38″   (d) 15.85″

Q.24 In using two-theodolite method for setting curves, the principle used is
(a) Deflection angle is equal to tangential angle for any chord to the point.
(b) Angle of intersection is the same as the angle sub tended at the centre.
(c) Deflection to any point P on curve from the first tangent point is the same as the angle between the long chord and the direction to P from the second tangent point.
(d) Equal chords subtend equal angles at the centre.

Q.25 A 5 m high flag post is situated at top of a multi-storey building which is 60.63 m away from a theodolite. The theodolite measures the vertical angle of 60° at top of flag. The

back sight reading is 2 m at instrument station. The height of building is
(a) 100 m   (b) 107 m
(c) 102 m   (d) 105 m

Q.26 A tacheometer was set up at a point on top of the summit and cross-hair readings were taken at the staff station as 1.150, 2.100 and 2.950. The vertical angle is –10°. The height of instrument is 1.5 m. The tacheometer is fitted with an anallatic lens. If the staff is held normal to the line of sight, then the horizontal distance between instrument station and staff station is,
[Take cos10° = 0.9848, sin10° = 0.1736]
(a) 176.900 m   (b) 174.572 m
(c) 175.638 m   (d) 177.630 m

Q.27 Consider the following statements regarding rock formation and its structural features:
1. When molten lava starts flowing from interior of earth and starts penetrating between other rocks and cools within it slowly, it is known as instrusive formation.
2. Folds formation occurs in rock due to stresses caused by lateral compression in past.
3. Fault approximately at right angle to folds are known as dip.
4. Metamorphism can also take place if hot lava flows into the layer of rock which are under pressure from deposits above the layer.
Which of the above statements is/are correct?
(a) 1, 2 and 3 only
(b) 1, 2 and 4 only
(c) 2, 3 and 4 only
(d) All are correct

Q.28 Vertical control in surveying means
(a) Using precise levelling instruments.
(b) Measuring vertical angles accurately.
(c) Establishing benchmarks accurately.
(d) Establishing contour lines.

Q.29 The zenith distance of a star at the lower culmination if the declination of the star is 83°40' and the latitude of the observer is 42°50', is
(a) 81°55'   (b) 53°30'
(c) 36°30'   (d) 70°20'

Q.30 Consider the following statements regarding contour interval:
1. If scale of map is small, then contour interval is kept large.
2. In special cases, a variable contour interval may also be provided.
3. For a flat ground, the contour interval is small.
Which of the above statement(s) is/are incorrect?
(a) 1 only   (b) 2 only
(c) 3 only   (d) 1, 2 and 3

Q.31 Match **List-I** (Methods) with **List-II** (Uses) and select the correct answer using the codes given below the lists:
List-I
A. Intersection
B. Radiation
C. Resection
D. Traversing
List-II
1. Area to be surveyed is small
2. A narrow strip of terrain is to be surveyed
3. The stations are inaccessible
4. The process of locating the instrument station
Codes:

	A	B	C	D
(a)	4	2	3	1
(b)	1	3	2	4
(c)	3	1	4	2
(d)	2	4	1	3

Q.32 The most probable value of the angle A from the following observation equations is:

$A = 40°20'15''$

$2A = 80°40'50''$

$4A = 161°21'20''$

(a) 85°27'16.4"   (b) 160°20'40"

(c) 40°20'20.7"   (d) 50°25'40"

Q.33 The following observations were taken in reciprocal levelling:

Instrument at	Staff reading at	
	A	B
A	1.625	2.545
B	0.725	1.405

The linear error in collimation if the distance between A and B is 1000 m, is

(a) 3.6 cm   (b) 1.2 cm

(c) 6.7 cm   (d) 5.3 cm

Q.34 A sidereal day is time taken by,

(a) The earth to move around the sun once.

(b) The moon to move around the earth once.

(c) The first point of aries to cross the same meridian once.

(d) The earth to move around its own axis once.

Direction (Q.35 to Q.38): The following items consists of two statements, one labelled as **Statement (I)** and the other labelled as **Statement (II)**. You have to examine these two statements carefully and select your answers to these items using the codes given below:

    Codes:

(a) Both Statement (I) and Statement (II) are true and Statement (II) is the correct explanation of Statement (I).

(b) Both Statement (I) and Statement (II) are true but Statement (II) is not a correct explanation of Statement (I).

(c) Statement (I) is true but Statement (II) is false.

(d) Statement (I) is false but Statement (II) is true.

Q.35 Statement (I): The level should be placed exactly midway between backsight and foresight.

Statement (II): Putting the level at midway leads to elimination of collimation error only when line of collimation is inclined upwards.

Q.36 Statement (I): In a theodilite if the lower clamp is not properly clamped or the instrument is not firmly tightened on the tripod head, the error introduced is known as 'slip'.

Statement (II): If the shifting head is loose, the error 'slip' will be introduced.

Q.37 Statement (I): For all the shapes of crossection, bending stress distribution is rectangular at fully plastic state.

Statement (II): Bending stress distribution is independent of the crossection at fully plastic state.

Q.38 Statement (I): Shear failure, splitting failure and bearing failure of plates are due to insufficient edge distance.

Statement (II): If the steel sections are used as tension member, then maximum pitch of tack bolts should not be greater than 1000 mm.

Section B : Solid Mechanics-I

Q.39 The strain tensor in xy plane is given as

$$\varepsilon = \begin{bmatrix} 10 & 6 \\ 6 & 12 \end{bmatrix} \times 10^{-3}$$

The value of normal strain in strain gauge inclined at 45° clockwise to x-axis is

(a) 2.5×10^{-3} (b) 5×10^{-3}

(c) 0.40×10^{-2} (d) 7×10^{-3}

Q.40 A rigid bar ABCD is hinged at A and supported in horizontal position by two identical wires as shown in figure. A vertical load of 30 kN is applied at D. The tensile force in wire BE is:
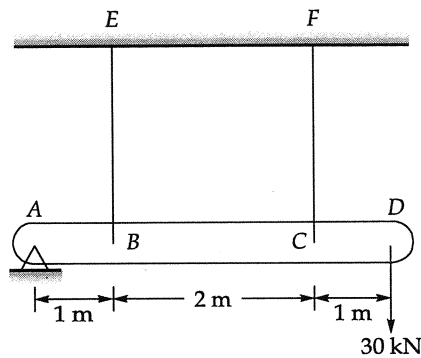
(a) 12 kN   (b) 18 kN
(c) 16 kN   (d) 10 kN

Q.41 For a circular bar of diameter 50 mm shown in figure below, the stress developed in portion AB portion is
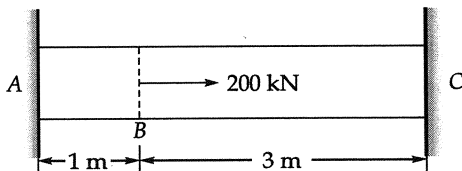
(a) $\dfrac{200}{\pi}$ MPa   (b) $\dfrac{220}{\pi}$ MPa

(c) $\dfrac{240}{\pi}$ MPa   (d) $\dfrac{120}{\pi}$ MPa

Q.42 For two beams of identical cross-section, carrying same bending moment at a particular section, which of the following is correct?
(a) The maximum bending stress will be same.
(b) The maximum shear stress will not be same.
(c) Radius of curvature of the beam having higher modulus of elasticity will be less.
(d) The maximum bending stress will not be same and infact depends on value of E.

Q.43 A 0.3 mm thick wire is rolled over a cylindrical surface of 30 mm diameter. If modulus of elasticity of the wire material is 120 GPa, then the maximum stress induced in the wire is
(a) 1300 N/mm² (b) 1188 N/mm²
(c) 1000 N/mm² (d) 1200 N/mm²

Q.44 For the beam shown below, the bending moment at mid–span of AB is
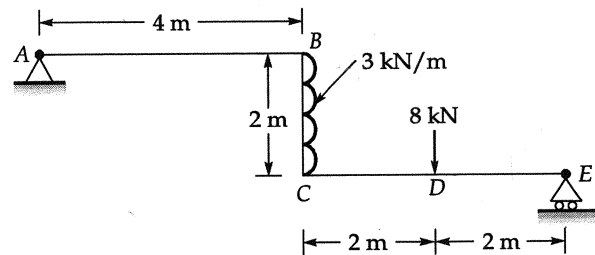
(a) 5.5 kN-m (Sagging)
(b) 4.5 kN-m (Hogging)
(c) 4.5 kN-m (Sagging)
(d) 5.5 kN-m (Hogging)

Q.45 Which of the following process is used to remove strain hardening?
(a) Relaxation   (b) Creep
(c) Annealing   (d) Work hardening

**Q.46** In a strained material, stresses are given below:
$\sigma_x = 120$ N/mm², $\sigma_y = -70$ N/mm²,
Take, $E = 2 \times 10^5$ N/mm² and $\mu = 0.3$. The volumetric strain energy stored per unit volume in the member is
(a) 625 N/m²   (b) 729.25 N/m²
(c) 833.33 N/m² (d) 927.67 N/m²

Q.47 Creep of a material is a property indicated by
(a) a time dependent strain of the material
(b) elongation of the material due to changes in the material properties
(c) shortening caused by shrinkage of the member
(d) the decrease in the volume of the material affected by the weather conditions

Q.48 Match **List-I** with **List-II** and select the correct answer using the codes given below the lists:
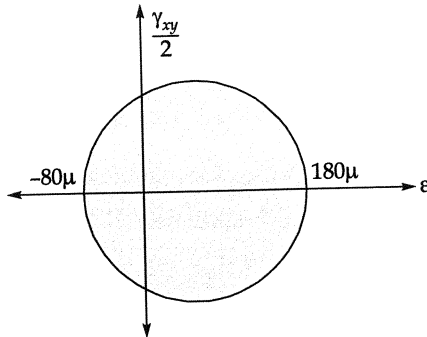
List-I

A. Maximum shear strain

B. Minimum principal strain

C. Normal strain at centre
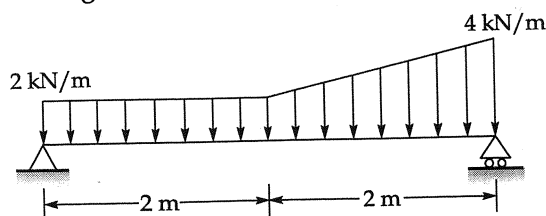
D. Shear strain at plane of zero normal strain

List-II

1. $240\ \mu$

2. -80μ

3. 50μ

4. 260μ

Codes:

	A	B	C	D
(a)	4	2	3	1
(b)	1	2	3	4
(c)	1	3	2	4
(d)	4	3	2	1

Q.49 For the beam shown in the figure below, the magnitude of shear force at mid-span is:

   (a) 4.33 kN   (b) 2.33 kN

   (c) 0.33 kN   (d) 1.33 kN

Direction (Q.50 to Q.52): The following items consists of two statements, one labelled as **Statement (I)** and the other labelled as **Statement (II).** You have to examine these two statements carefully and select your answers to these items using the codes given below:

Codes:

(a) Both Statement (I) and Statement (II) are true and Statement (II) is the correct explanation of Statement (I).

(b) Both Statement (I) and Statement (II) are true but Statement (II) is not a correct explanation of Statement (I).

(c) Statement (I) is true but Statement (II) is false.

(d) Statement (I) is false but Statement (II) is true.

Q.50 Statement (I): Most of the structural materials do not have well defined yield point.

Statement (II): Yield stress is found out by intersection of 0.2% offset line parallel to initial tangent modulus.

Q.51 Statement (I): True stress is always more than engineering stress in a tensile test of a specimen.

Statement (II): Area of cross-section reduces due to lateral compressive strain.

Q.52 Statement (I): In a body loaded under plane stress condition, number of independent stress components is 3.

Statement (II): The general state of stress at a point in 3D is characterized by six stress components.

Section C : Geo-technical & Foundation Engg-II + Environmental Engg-II

Q.53 Match **List-I** (Name of soil) with **List-II** (Definition) and select the correct answer using the codes given below the lists:

List-I

A. Kaolin

B. Marl

C. Tuff

D. Humus

List-II

1. Very fine grained calcium carbonated soil of marine origin.
2. Pure form of white clay used in ceramic industry.
3. Small grained slightly cemented volcanic ash.
4. Mixture of mud and dead plant.

Codes:

	A	B	C	D
(a)	1	2	3	4
(b)	4	3	2	1
(c)	2	1	3	4
(d)	2	3	4	1

Q.54 A deep cut is made in a soft clay having $C = 42$ kN/m^2. The depth of the cut is 7 m and its width is 3.2 m. The length of footing of footing is fairly long. If the saturated unit weight of the clay is 21 kN/m^3 then what is the factor of safety against the heave of the bottom of the cut?
(a) 2.05
(b) 1.05
(c) 2.67
(d) 1.33

Q.55 Consider the following statements regarding Terzaghi's theory:
1. A foundation is considered shallow if its depth is less than 1 m.
2. Terzaghi's theory is applicable when the base of the footing is rough.

Which of the above statement(s) is/are correct?
(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

Q.56 A 500 mm wide concrete pile square in section 10 m long, is driven in a deep deposit of uniform clay. If unconfined compression test on an undisturbed sample indicated an average unconfined compressive strength of 100 kN/m^2 then the ultimate load capacity of the pile is____. [Assume, $\alpha = 0.8$]
(a) 837.3 kN
(b) 922.6 kN
(c) 889.7 kN
(d) 912.5 kN

Q.57 A concrete pile, 10 m long, was driven by a single acting hammer with rated energy of 40 kJ. If the total settlement as recorded for the 10 blows was 2.46 mm/blow, then the pile load capacity is_____. [Using Engineering News formula]
(a) 1667.33 kN
(b) 1112.67 kN
(c) 1333.12 kN
(d) 1029.54 kN

Q.58 A 30 cm square test plate settles by 21 mm in a plate load test conducted on a granular soil when the loading intensity was 250 kN/m^2. The settlement of a footing of 1.8 m square, resting on the same soil, at the same intensity of loading is
(a) 61.71 mm
(b) 57.55 mm
(c) 66.67 mm
(d) 126 mm

Q.59 Which of the following method of compaction is not suitable for cohesionless soils?
(a) Precompression
(b) Vibroflotation
(c) Terra probe
(d) Compaction by blasts

Q.60 An excavation is made with a vertical face in a clay soil which has $C_u = 50$ kN/m^2 and $\gamma = 20$ kN/m^3. If the Taylor's stability number is 0.261 then what is the maximum depth of excavation so that the excavation is stable?
(a) 10.25 m
(b) 9.58 m
(c) 8.40 m
(d) 11.336 m

Q.61 Match **List-I** (Type of pile) with **List-II** (Suitable conditions) and select the correct answer using the codes given below the lists:

List-I
A. Friction pile
B. Batter pile
C. Tension pile
D. Compaction pile

List-II
1. Stiff clay
2. Loose granular soil
3. Lateral load
4. Uplift load

Codes:

	A	B	C	D
(a)	3	1	2	4
(b)	1	3	4	2
(c)	1	3	2	4
(d)	3	1	4	2

Q.62 Consider the following statements:
1. The inside clearance allows elastic expansion of the sample when it enters the tube.
2. The outside clearance should be as large as possible, for reducing the driving force.
3. The area ratio is defined as the ratio of area of soil sample to the maximum cross-sectional area of the cutting edge.

Which of the above statement(s) is/are correct?
(a) 1 and 2 only   (b) 1 only
(c) 1 and 3 only   (d) 1, 2 and 3

Q.63 In a BOD test using 6% dilution of the sample, the dissolved oxygen value for diluted sample after five days of incubation at 20°C was 3.7 mg/l. Dissolved oxygen originally present in the undiluted sample was 0.7 mg/l. If the 5 days 20°C BOD of the sample was 80 mg/l, then DO present in dilution water originally is,
(a) 8.7 mg/l (b) 10.3 mg/l
(c) 9.0 mg/l (d) 9.20 mg/l

Q.64 Consider the following statements regarding relative stability:
1. It is defined as the ratio of oxygen available in the effluent to the total oxygen required to satisfy its first stage BOD demand.

2. The decolourisation of methylene blue solution is caused by enzymes produced by aerobic bacteria.

Which of the above statements is/are correct?
(a) 1 only   (b) 2 only
(c) Both 1 and 2   (d) Neither 1 nor 2

Q.65 Match **List-I** (Zones in lake) with **List-II** (Description) and select the correct answer using the codes given below the lists:

List-I
A. Euphotic zone
B. Benthic zone
C. Littoral zone

List-II
1. The bottom where sediments are deposited.
2. Shallow water near the shore in which rooted plants grow.
3. Sunlight can penetrate.

Codes:

	A	B	C
(a)	1	2	3
(b)	3	2	1
(c)	2	1	3
(d)	3	1	2

Q.66 The BIS standard for waste water effluent carrying fluoride to be discharged into sea is,
(a) 250 mg/l (b) 20 mg/l
(c) 100 mg/l (d) 15 mg/l

Q.67 A sewer has a diameter of 150 mm and slope of $\dfrac{1}{900}$. While running full, it has a mean velocity of 1 m/sec. If both the diameter and slope are doubled, then changed mean velocity of sewer when flowing full is,
(a) $(3)^{7/6}$ m/s   (b) $(2)^{2/3}$ m/s
(c) $(2)^{7/6}$ m/s   (d) $(3)^{2/3}$ m/s
[Use Manning's formula]

Q.68 A grit chamber of depth 1.5 m is designed to remove particles of a diameter 0.2 mm and specific gravity 2.6. The settling velocity of the particles is 0.017 m/s. If the flow velocity through proportional weir is to be 0.3 m/sec, then length of the tank is about
(a) 27 m   (b) 17 m
(c) 13 m   (d) 22 m

Q.69 Consider the following statements regarding coagulation aided sedimentation in sewage treatment:
1. Sludge digestion is difficult.
2. Volume of sludge produced is comparatively less.
3. It helps in controlling eutrophication of rivers.
Which of the above statements is/are incorrect?
(a) 1 only   (b) 2 only
(c) 3 only   (d) 2 and 3 only

Q.70 The recirculation factor for high rate frickling filter having recirculation ratio as 1.2 and treatability factor of sewage as 0.80, is
(a) 1.75   (b) 1.56
(c) 1.28   (d) 1.43

Q.71 A continuous mixed-flow activated sludge process is designed to yield an effluent BOD_5 of 20 mg/l. The influent BOD_5 following primary clarification is 200 mg/l. The waste flow is 0.2 m³/sec. If the rate of sludge production is obtained as 1.55×10^9 mg/day, then oxygen demand of the process corresponding to removal of carbonaceous BOD is,
(a) 1990 kg/day   (b) 2551 kg/day
(c) 2371 kg/day   (d) 2857 kg/day

Q.72 Consider the following statements regarding imhoff tanks:
1. The detention period is 2 to 4 hours.
2. It removes around 60 to 70% of solids and 30 to 40% of BOD.

3. It is unsuitable for acidic influents.
Which of the above statements is/are correct?
(a) 1 and 2 only   (b) 2 only
(c) 1 and 3 only   (d) 1, 2 and 3

Direction (Q.73 to Q.75): The following items consists of two statements, one labelled as **Statement (I)** and the other labelled as **Statement (II)**. You have to examine these two statements carefully and select your answers to these items using the codes given below:
  Codes:
(a) Both Statement (I) and Statement (II) are true and Statement (II) is the correct explanation of Statement (I).
(b) Both Statement (I) and Statement (II) are true but Statement (II) is not a correct explanation of Statement (I).
(c) Statement (I) is true but Statement (II) is false.
(d) Statement (I) is false but Statement (II) is true.

Q.73 Statement (I): In dynamic cone test, the driving energy is given by 65 kg hammer falling through a height of 75 cm.
Statement (II): The number of blows required for 10 cm of penetration is taken as the dynamic cone resistance.

Q.74 Statement (I): The critical section for bending moment in case of spread footing of a monolithic column is at the face of the column.
Statement (II): A strip footing can be provided for a row of closely spaced columns.

Q.75 Statement (I): The flow velocity in a sewer should be such that neither the suspended solids in the sewage gets silt up nor the sewer pipe material gets scoured.
Statement (II): First condition limits the minimum velocity and second condition limits the maximum velocity.

■■■■