Q) Which of the following is not considered as design vehicles in IRC-3-1983?

A: Single unit truck

B: Semi trailer combination

C: Truck trailer combination

D: Passenger car

Q) Which type of coordinated signal system is not conducive to give continuous movement of all vehicles as given in IRC 93-1985?

A: Flexible progressive system

B: Limited progressive system

C: Simple progressive system

D: Simultaneous system

Q) The unit coefficient of consolidation is

A: cm^2/gm

B: cm^2/sec

C: $gm/cm^2/sec$

D: gm-cm/sec

Q) Which of the following gives the correct decreasing order of the densities of a soil sample?

A: Saturated, submerged, wet, dry

B: Saturated, wet, submerged, dry

C: Saturated, wet, dry, submerged,

D: Wet, saturated, submerged, dry

Q) A sample of clay and a sample of sand have the same specific gravity and void ratio. Their permeabilities would differ because

A: Their porosities would be different

B: Their degrees of saturation would be different

C: Their densities would be different

D: The size ranges of their voids would be different

Q) In a saturated clay layer undergoing consolidation with single drainage at its top, pore water pressure would be the maximum at its

A: Top

B: Middle

C: Bottom

D: Top as well as bottom

Q) The creep strain are

A: Caused due to dead loads only

B: Caused due to live loads only

C: Caused due to both dead load and live loads

D: Independent of loads

Q) The side face reinforcement, if required in a T-beam will be

A: 0.1% of the web area

B: 0.15% of the web area

C: 0.2% to 0.3% of the web area depending upon web area depending upon the breadth of the web

D: Half the longitudinal reinforcement

Q) The minimum clear covers (in mm) to the main still bars in slab, beam, column and footing are respectively

A: 10, 15, 20, 25

B: 15, 25, 40, 75

C: 20, 25, 30, 40

D: 20, 35, 40, 75

Q) Which of the following methods of structural analysis is a force method?

A: Slope deflection method

B: Column analogy method

C: Moment distribution method

D: None of the above

Q) The fixed support in a real beam becomes in the conjugate beam at

A: Roller support

B: Hinged support

C: Fixed support

D: Free end

Q) The Castigliano's 2nd theorem can be used to compute deflections

A: In statically determinate structures only

B: For any type of structure

C: AT the point under the load only

D: For beam and frames only

Q) When the length of bodywall of a fall is less than the normal width of a canal, it is called

A: Notch fall

B: Sarda fall

C: Flumed fall

D: Ogee fall

Q) Quoins in brick masonry are

A: Bricks cut a corners in a triangular fashion

B: Half-brick with length same but width halved

C: Squint junction of walls

D: Corner junction of walls

Q) Impact value of stone for road work specified is

A: Wearing coat 30%

B: Bituminous macadam 35%

C: Water-bound macadam 40%

D: All of the above

Q) Fineness modulus is

A: The ratio of fine aggregates to coarse aggregate

B: The ratio of fine aggregates to total aggregate

C: An index which gives the mean size of the aggregates used in a mix

D: None of the above

Q) Match List-I with List-ii and select the correct answer using the codes given below the lists:

List - I	List - II
A. Cambium layer	1. Youngest layer
B. Pith	2. Innermost part
C. Heartwood	3. Thin Layer of fresh sap
D.Sapwood	4. Portion surrounding pith

1. A – 1, B – 2, C – 3, D – 4
2. A – 3, B – 2, C – 4, D – 1
3. A – 4, B – 1, C – 3, D – 2
4. A – 1, B – 3, C – 2, D – 4

Q) The BOD removal efficiency in percentage, during primary treatment, under normal conditions is about

A: 65%

B: 85%

C: 30%

D: Zero

Q) Bulking sludge refers to having

A: f/m < 0.3/d

B: 0.3/d < f/m < 0.6/d

C: f/m = zero

D: f/m > 0.6/d

Q) The relationship among modulus of elasticity e, bulk modulus k and poisson's ratio m is

A: e = 3k (1 + 2m)

B: e = 3k (1 – 2m)

C: e = 2k (1 + m)

D: e = 2k (1 – 2 m)

Q) A portion of beam between two sections is said to be pure bending, when there is

A: Constant bending moment and constant shear force

B: Constant bending moment and zero shear force

C: Zero bending moment and constant shear force

D: Zero bending moment and zero shear force

Q) Maximum shear stress in a beam of circular section is _____ times the average stress.

A: 1.25

B: 1.33

C: 1.5

D: 1.67

Q) Critical path lies along the activities having total float

A: Positive

B: Negative

C: Zero

D: Same

Q) For walls having thickness of wall more than one and a half brick, the following bond is more compact and stronger:

A: Double Flemish bond

B: English bond

C: Garden wall bond

D: Dutch bond

Q) Which one of the following is responsible for initial set and high heat of hydration?

A: Tri-calcium silicate

B: Di-calcium silicate

C: Tri-calcium aluminate

D: Tetra-calcium alumina ferrite

Q) Ring and ball apparatus is used for the following test of bitumen:

A: Penetration

B: Viscosity

C: Ductility

D: Softening point

Q) Error due t bad ranging is:

A: Cumulative positive

B: Cumulative negative

C: Compensative

D: Never serious

Q) The coefficient of uniformity of a soil is given by:

A: $\frac{D_{10}}{D_{60}}$

B: $\frac{D_{60}}{D_{10}}$

C: $\frac{D_{60}}{D_{30}}$

D: $\frac{D_{30}}{D_{60}}$

Q) A vertical retaining wall retains a C- ϕ backfill with a surcharge of uniform intensity q per unit area. The depth Z_o where the active earth pressure is zero, is given by.

A: $\frac{q}{\Upsilon}$

B: $\frac{2c'}{\Upsilon}\ tan\ \alpha' - q/\Upsilon$

C: $\frac{2c'}{\Upsilon}\ tan\ \alpha' + q/\Upsilon$

D: $\frac{2c'}{\Upsilon}\ tan\ \alpha'$

Q) The scour depth as per Lacey's theory is given as follows (where q is the discharge intensity and f is the silt factor):

(a) $R = 1.35\left(\frac{q^2}{f}\right)^{1/3}$ (b) $R = 1.35\left(\frac{q}{f^2}\right)^{1/3}$

(c) $R = 1.35\left(\frac{f}{q^2}\right)^{1/3}$ (d) $R = 1.35\left(\frac{f^2}{q}\right)^{1/3}$

Q) The maximum deflection of a fixed beam with central point load W is given as equal to:

A: $\frac{WL^4}{192EI}$

B: $\frac{WL^3}{192EI}$

C: $\frac{WL^3}{384EI}$

D: $\frac{WL^4}{384EI}$

Q) In a statically determinate plane frame the relationship between member of bars and joints can be expressed as:

A: $j = 2n - 3$

B: $n = 2j - 3$

C: $j = 3n - 2$

D: $n = 3j - 2$

Where n = number of bars, ‘j’ = number of joints

Q) For most of the applications, water to cement ratio should be between:

A: 0.4 and 0.5

B: 0.5 and 0.55

C: 0.55 and 0.60

D: 0.69 and 0.65

Q) The minimum cement content in moderately exposed reinforced concrete with normal weight aggregates of 20 mm nominal maximum size is:

A: 220 kg/m^3

B: 240 kg/m^3

C: 280 kg/m^3

D: 300 kg/m^3

Q) For lightly reinforced sections in slabs, beams, columns etc. The slump should be:

A: 15-25 mm

B: 25-75 mm

C: 50-100 mm

D: 75-100 mm

Q) In a reinforced concrete beam the distribution of shear stress is:

A: Parabolic over and below the neutral axis

B: Parabolic over neutral axis and rectangular below neutral axis

C: Rectangular over neutral axis and parabolic below neutral axis

D: Rectangular over and below neutral axis

Q) In soundness test by Le Chatelier's apparatus the increase in the distance between the pointers should be more than:

A: 1 to 2 mm

B: 3 to 5 mm

C: 5 to 10 mm

D: 10 to 15 mm

Q) Desire lines are plotted in:

A: Traffic volume studies

B: Speed studies

C: Accident studies

D: Origin and destination studies

Q) If a material has identical elastic properties in all directions, it is said to be:

A: Homogenous

B: Isotropic

C: Elastic

D: Orthotropic

Q) Maximum bending moment in a beam occurs where

A: Deflection is zero

B: Shear force is maximum

C: Shear force is minimum

D: Shear force changes sign

Q) The shear force and bending moment is zero at the free end of a cantilever beam, if it carries:

A: Point load at the fee end

B: Point load at the middle of its length

C: Uniformly distributed load over the whole length

D: None of these