

1. Geodetic survey is different from plane surveying because of \_\_\_\_\_.

- A. Very large area is covered
- B. The curvature of the earth is considered
- C. Undulations of the topography
- D. The large difference of elevations

Ans. B.

Geodetic survey is different from plane surveying because of the curvature of earth is considered, while in plane surveying the earth of curvature is not considered.

2. A scale representing either three units or only one unit and its fractions up to second place of decimal point is \_\_\_\_\_.

- A. Diagonal scale
- B. comparative scale
- C. Vernier scale
- D. Shrunk scale

Ans. A.

A scale representing either three units or only one unit and its fractions up to second place of decimal point is known as the diagonal scale, while plane scale is represents only two dimension.

3. Difference in length of an arc and its subtended chord on earth's surface for a distance of 18.2 km is \_\_\_\_\_.

- A. 10 mm
- B. 15 mm
- C. 22 mm
- D. 100 mm

Ans. A.

Difference in length of an arc and its subtended chord on earth's surface for a distance of 18.2 km is = 10 mm. due to such a small variation that's why to ease of calculation the earth curvature is considered plan instead of geodetic.

4. Chain surveying is most suitable when \_\_\_\_\_.

- A. The ground is fairly leveled and open with simple details
- B. The area is small in extent
- C. Plans are required on a large scale
- D. All option are correct

Ans. D.

Chain surveying is most suitable when The ground is fairly leveled and open with simple details, The area is small in extent, Plans are required on a large scale.

If all these things are not then the other method of surveying is adopted.

5. Every 20 m chain should be accurate to within \_\_\_\_\_.

- A.  $\pm 2$  mm
- B.  $\pm 5$  mm
- C.  $\pm 8$  mm
- D. None of the above

Ans. B.

Every 20 m chain should be accurate to within =  $\pm 5$  mm

This is the least count for 20m chain

6. Method used for chaining on sloping ground is \_\_\_\_\_.

- A. By stepping method
- B. By hypotenusal allowance method
- C. By clinometers method
- D. Both stepping method and hypotenusal method

Ans. D.

Method used for chaining on sloping ground is stepping method and hypotenusal method.

7. Maximum allowable limit up to that a measurement may vary from the true value is known as \_\_\_\_\_.

- A. Permissible error
- B. Residual error
- C. Expected error
- D. Safe error

Ans. A.

Permissible error is defined as Maximum allowable limit up to that a measurement may vary from the true value.

Residual error are those values which cannot be avoided during measurement it can be counter balance by suitable correction measures.

8. Number of links in a 30 m metric chain is \_\_\_\_\_.

- A. 100
- B. 150
- C. 180
- D. 200

Ans. B.

Length of one link = 20 cm

And the 30m =  $30 \times 100 = 3000$  cm

So number of links =  $3000 / 20 = 150$ .

9. Prolongation of chain line across an obstruction in chain surveying is done by \_\_\_\_\_.

- A. making angular measurements
- B. drawing perpendiculars with a chain
- C. solution of triangles
- D. All options are correct

Ans. B.

Prolongation of chain line across an obstruction in chain surveying is done by drawing perpendiculars with a chain. Angular measurement involved in dumpy level or theodolite surveying.

10. Positive error is caused if \_\_\_\_\_.  
A. Length of chain is shorter than the standard  
B. Slope and sag corrections is not applied  
C. Measurements are made along the incorrectly aligned line  
D. All options are correct

Ans. D.

Positive error is caused when Length of chain is shorter than the standard, Slope and sag corrections is not applied, Measurements are made along the incorrectly aligned line.

Slope and sag correction involves negative correction in the measurement.

11. Which of the following statements is true?

- A. In a dry soil all the voids are filled with air  
B. In a saturated soil all the voids are filled with water  
C. In a partially saturated soil voids are occupied by both air and water  
D. All options are correct

Ans. D.

Dry soil = moisture is completely replaced by air in the voids, only structural bound moisture present into the soil.

Saturated= all the voids are filled with water.

Partially saturated soil = both air and water are filled with the voids.

12. The void ratio for saturated soil is equal to \_\_\_\_\_ of water content and specific gravity of solids.

- A. sum                      B. product  
C. difference              D. ratio

Ans. B.

$S_e = G_w$ ,  $e = G_s w$ ,  $S = 1$  for saturated soil

$S$  = degree of saturation

$e$  = void ratio

$G$  = specific gravity

$W$  = moisture content

13. Specific gravity of soil is \_\_\_\_\_.  
A. same for clays and sands  
B. determined by hydrometer  
C. less than 2 for most soils  
D. more than 2.5 for most soils

Ans. D.

Specific gravity of soil is  $> 2.5$

The soil having mineral content more have more specific gravity.

14. Density index for a natural soil is used to express \_\_\_\_\_.  
A. percentage voids  
B. relative compactness  
C. shear strength of clays  
D. specific gravity

Ans. B.

Density index for a natural soil is used to express relative compactness of soil.

Density index or relative density =  $(e_{max} - e) / (e_{max} - e_{min})$

15. The point in the immersed body through which the resultant pressure of the liquid may be taken to act is known as \_\_\_\_\_.  
A. Meta centre  
B. Centre of pressure  
C. Centre of buoyancy  
D. Centre of gravity

Ans. B.

The point in the immersed body through which the resultant pressure of the liquid may be taken to act at the center of pressure, the the buoyancy act at the center of buoyancy and weight act at the center of gravity.

16. Surface tension \_\_\_\_\_.  
A. Acts in the plane of interface normal to any line in the surface  
B. Is also known as capillarity  
C. Is a function of the curvature of the interface  
D. Decreases with fall in temperature

Ans. D.

On increasing the temperature of liquid the surface tension is decreases surface tension is due to viscosity, and viscosity is decreases on increases of temperature

17. Speed of a submarine can be measured by \_\_\_\_\_.  
A. Pilot tube  
B. Hot wire anemometer  
C. Pirani gauge  
D. Inclined manometer

Ans. C.

Speed of a submarine can be measured by pirani gauge  
Pitot tube measures the velocity  
Hot wire anemometer velocity of gases .

18. The pressure in meters of oil (Specific gravity 0.85) equivalent to 42.5m of water is \_\_\_\_\_.

- A. 42.5 m
- B. 50 m
- C. 52.5 m
- D. 85 m

Ans. B.

Specific gravity of oil = 0.85, density of oil =  $0.85 \times 1000 = 850$

Height of water column = 42.5 m

Density<sub>oil</sub> x g x height<sub>oil</sub> = density<sub>water</sub> x g x height<sub>water</sub>

$850 \times 9.81 \times \text{height}_{\text{oil}} = 1000 \times 9.81 \times 42.5$

height<sub>oil</sub> = 50 m

19. The velocity distribution for flow between two fixed parallel plate \_\_\_\_\_.

- A. Is constant over the cross-section
- B. Is zero at the plates and increases linearly to the mid-plane
- C. Varies parabolically across the section
- D. Is zero in middle and increase linearly towards the plates

Ans. C.

The velocity distribution for flow between two fixed parallel plate = parabolically across the section

As  $U = (-dp/dx) \times (ty - y^2) / 2\mu$

The velocity equation is in the form of quadratic so distribution will be parabolic in nature.

20. Wake always occurs \_\_\_\_\_.

- A. Before a separation point
- B. After a separation point
- C. Before and after a separation point
- D. None of these

Ans. B.

Wake always occurs after a separation point into a boundary layer.

21. The depth of water below the spillway and after hydraulic jump are 1 m and 6 m respectively. The head loss will be \_\_\_\_\_.

- A. 6.2m
- B. 5.2m
- C. 4.35m
- D. 5.0m

Ans. B.

Head loss =  $(y_2 - y_1)^3 / 4y_1y_2 = (6-1)^3 / (4 \times 6 \times 1) = 5.2 \text{ m}$

22. Fire hose nozzle is generally made of \_\_\_\_\_.

- A. Divergent shape
- B. Convergent shape
- C. Cylindrical shape
- D. Parabolic shape

Ans. B.

Fire hose nozzle is generally made of convergent shape

23. Energy loss in flow through nozzle as compared to venturimeter is \_\_\_\_\_.

- A. Same
- B. More
- C. Less
- D. Unpredictable

Ans. A.

Energy loss in flow through nozzle as compared to venturimeter is same, coefficient of discharge are same for both the arrangements.

24. The resultant upward pressure of the fluid on an immersed body is called \_\_\_\_\_.

- A. Upthrust
- B. Buoyancy
- C. Centre of pressure
- D. All option are correct

Ans. B.

The resultant upward pressure of the fluid on an immersed body is called buoyancy. It acts at the center of buoyancy. If center of buoyancy coincide with center of gravity the it is called neutral equilibrium.

25. A canal, designed to irrigate throughout the year is \_\_\_\_\_.

- A. Permanent canal
- B. Perennial canal
- C. Continuous canal
- D. Green canal

Ans. B.

Perennial canal are designed for the irrigation throughout the year, while inundate canal are not irrigate the throughout the year.

26. On rolling land, the method of applying water is \_\_\_\_\_.

- A. check flooding
- B. Free flooding
- C. Border flooding
- D. Furrow flooding

Ans. B.

On rolling land, the method of applying water is free flooding. In steep land sprinkler method are more suitable for irrigation.

27. In plains the minimum length of transition curve is \_\_\_\_\_.

- A.  $V^2/R$
- B.  $V^2/1.5R$
- C.  $2.7V^2/R$
- D.  $V^2/24R$

Ans. C.

This is the imperial formula given by the IRC to calculate the minimum length of transition curve in plan and rolling terrain. And for hilly areas =  $V^2/R$

28. The magnitude of super-elevation provided in Indian Railways on Broad gauge is \_\_\_\_\_ (in m)

- A.  $1.315 V^2/R$
- B.  $0.615 V^2/R$
- C.  $0.81 V^2/R$
- D.  $0.415 V^2/R$

Ans. A.

The magnitude of super-elevation provided in Indian Railways on Broad gauge is  $1.315 V^2/R$

For meter gauge  $1x V^2/R$

For narrow gauge  $0.676xV^2/R$

29. A simply supported beam of circular cross section with diameter  $d$  and length  $l$  carries a concentrated load  $W$  at the centre of the beam. The

strength of the beam is proportional to \_\_\_\_\_.

- A.  $1/D^3$
- B.  $1/D^2$
- C.  $D^3/1$
- D.  $D^2/1$

Ans. C.

A simply supported beam of circular cross section with diameter  $d$  and length  $l$  carries a concentrated load  $W$  at the centre of the beam. The strength of the beam is proportional to  $D^3/1$ , while deflection is also  $D^3/1$

30. Which of the following materials is expected to have the least value of Young's modulus of elasticity?

- A. Wood
- B. Copper
- C. Glass
- D. Aluminium

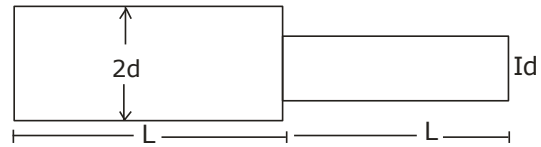
Ans. C.

Glass have the least value of Young's modulus of elasticity?

31. Two shafts of same length and material are joined in series. If the ratio of their diameters is 2, then the ratio angle of twist will be \_\_\_\_\_.

- A. 2
- B. 4
- C. 8
- D. 16

Ans. D.



$$\text{Ratio} = 2d/d = 2$$

$$\frac{T}{J} = \frac{\tau}{r} = \frac{G\theta}{L} \Rightarrow \theta = \frac{TL}{GJ}$$

$$\theta_1 = \frac{TL}{GJ_1}, \theta_2 = \frac{TL}{GJ_2}$$

$$\frac{\theta_1}{\theta_2} = \frac{J_2}{J_1} = \frac{\frac{\pi(2d)^4}{32}}{\frac{\pi(d)^4}{32}} = 16$$

32. A open-coiled helical spring of mean diameter  $D$ , number of coils  $N$  and wire diameter  $d$  is subjected to an axial force  $P$ . The wire of the spring will be subject to

- A. Direct shear only
- B. Combined shear and bending only
- C. Combined shear, bending and twisting
- D. Combined shear and twisting only

Ans. C.

The wire of spring will be subject to Combined shear, bending and twisting, as capacitor store energy in the electric circuit same as springs store the mechanical energy.

33. The ratio of moment of inertia about the neutral axis to the distance of the most distant point of the section from the neutral axis is called \_\_\_\_\_.

- A. Polar modulus
- B. Section modulus
- C. Modulus of rupture
- D. Flexural rigidity

Ans. B.

Section modulus is defined as The ratio of moment of inertia about the neutral axis to the distance of the most distant point of the section from the neutral axis.

34. For a hollow shaft of external and internal diameters 10 cm and 5 cm respectively, the torsional sectional modulus will be approximately \_\_\_\_\_.

- A.  $184 \text{ cm}^2$
- B.  $275 \text{ cm}^2$
- C.  $368 \text{ cm}^2$
- D.  $536 \text{ cm}^2$

Ans. A.

$$\frac{T}{J} = \frac{\tau}{r} = \frac{G\theta}{l}$$

$$\frac{J}{r} = \frac{T}{\tau} = \frac{G\theta}{l}$$

$\frac{J}{r}$  = Torsional section modulus

$$J = \frac{\pi(D_1^4 - D_2^4)}{32} = \frac{\pi(10^4 - 5^4)}{32} = 920.4$$

$$r = \frac{10}{2} = 5 \text{ cm}$$

So,

$$\frac{J}{r} = \frac{920.4}{5} = 184 \text{ cm}^2$$

35. A solid circular shaft has been subjected to a pure torsion moment. The ratio of maximum shear stress to maximum normal stress at any point would be \_\_\_\_\_.

- A. 1:2                      B. 2:3  
C. 1:1                      D. 2:1

Ans. C.

In case of pure torsion moment The ratio of maximum shear stress to maximum normal stress at any point = 1:1

36. Flat spiral springs are used in \_\_\_\_\_.

- A. Cycles                      B. Road vehicles  
C. Railway wagons      D. Watches

Ans. D.

Flat spiral springs are used in watches, cycle, road vehicles and railway wagons used the long spiral and leaf spring.

37. A column with highest equivalent length has \_\_\_\_\_.

- A. Both ends fixed  
B. Both ends hinged or pin-jointed  
C. One end fixed, the other entirely free  
D. One end fixed, other end hinged

Ans. C.

A column with highest equivalent length has One end fixed, the other entirely free = 2L

Both fixed = L/2

Both hinged = L

One fixed on hinged = L/√2

38. Refer Rankine's empirical correlation for buckling load of an intermediate column. The value of constant and will be least for a column made of \_\_\_\_\_.

- A. Cast iron                      B. Wrought iron  
C. Mild steel                      D. Timber

Ans. B.

Refer Rankine's empirical correlation for buckling load of an intermediate column. The value of constant and will be least for a column made of Wrought iron, it is the purest form of steel, it is the ductile material and can not be casted into the moulds

39. If a point load acting at the mid span of a fixed beam of uniform section produces fixed end moments of 60 kNm, then same load spread uniformly over the entire span will produce fixed end moments equal to \_\_\_\_\_.

- A. 20 kNm                      B. 30 kNm  
C. 40 kNm                      D. 45 kNm

Ans. C.

Fixed end moment for fixed beam load at mid span = WL/8 = 60 kNm

Fixed end moment for fixed beam load uniformly distributed entire span = wL<sup>2</sup>/12

So end moment will be 40 kNm

40. At a point in a strained material, if two mutually perpendicular tensile stresses of 2000 kg/cm<sup>2</sup> and 1000 kg/cm<sup>2</sup> are acting, then the intensity tensile stress on a plane inclined at 150 to the axis of the minor stress will be \_\_\_\_\_.

- A. 125 kg/cm<sup>2</sup>                      B. 250 kg/cm<sup>2</sup>  
C. 500 kg/cm<sup>2</sup>                      D. 1000 kg/cm<sup>2</sup>

Ans. B.

Both the tensile stress are 2000 kg/cm<sup>2</sup> and 1000 kg/cm<sup>2</sup>

And angle from minor axis = 150°

And it will be 60° from major axis.

So intensity tensile stress on a plane = [(2000-1000)/2]xsin(2x60) = 250 kg/cm<sup>2</sup>

41. The workability of concrete can be improved by \_\_\_\_\_.

- A. More sand  
B. More cement  
C. More fine aggregate  
D. Fineness of coarse aggregate

Ans. D.

Workability is directly proportional to water cement ratio and grading of materials, in this case Fineness of coarse aggregate increases the workability.

42. Strength of concrete increases with \_\_\_\_\_.

- A. Increase in water cement ration
- B. Decrease in water cement ratio
- C. Decrease in size of aggregate
- D. Decrease in curing time

Ans. B.

Strength of concrete is inversely proportional to water cement ratio, so Strength of concrete increases with Decrease in water cement ratio

43. Density of concrete \_\_\_\_\_.

- A. Increases with a decrease in the size of aggregate
- B. In independent of the size of aggregate
- C. Increases with increase in the size of aggregate
- D. All options are correct

Ans. A.

Density of concrete Increases with a decrease in the size of aggregate, fine material adjusted the strength of concrete and increases the density of the concrete.

44. Workability of concrete mix with low water cement ratio is determined by \_\_\_\_\_.

- A. Slump test
- B. Tensile strength test
- C. Compaction factor test
- D. Flexural strength test

Ans. C.

Slump test used for high workable mixture Workability of concrete mix with low water cement ratio is determined by Compaction factor test.

45. If the compaction facto is 0.95, the workability is concrete is \_\_\_\_\_.

- A. Very low
- B. Low
- C. Medium
- D. High

Ans. D.

If the compaction facto is 0.95, the workability is concrete is high, 0.95 is the imperical value to determine the workability of concrete (0.85, 0.92, 0.95 low medium and high respectively)

46. Which of the following proportion of the ingredients of concrete mix, is not in conformation to arbitrary method of proportioning?

- A. 1:1:2
- B. 1:2:4
- C. 1:3:6
- D. 1:4:10

Ans. D.

1:1:2=M20, 1:2:4=M15 and 1:3:6=M10 are the arbitrary proportions of concrete mixes but 1:4:10 is not that category.

47. Concrete gains strength due to \_\_\_\_\_.

- A. Chemical action of cement with coarse aggregate
- B. Hydration of cement
- C. Evaporation of water
- D. All option are correct

Ans. B.

Concrete gains strength due to Hydration of cement, more hydration of cement involves more early strength.

48. Maximum shrinkage takes place in concrete after drying for \_\_\_\_\_.

- A. 28 days
- B. Three months
- C. Six months
- D. One year

Ans. A.

Maximum shrinkage takes place in concrete after drying for 28 days, at 28 days concrete gains its approximate 80 to 85% strength,

49. Under constant load the Creep strain in concrete is \_\_\_\_\_.

- A. Time dependent
- B. Temperature dependent
- C. Moisture dependent
- D. None of these

Ans. A.

Under constant load the Creep strain in concrete is Time dependent as  $E_c / (1 + \theta)$   
 $\theta$  = age factor

50. The light weight concrete is prepared by \_\_\_\_\_.

- A. Using light aggregate
- B. Formation of air voids in cement by omitting sand
- C. Formation of air voids in cement paste by the substances causing foam
- D. All options are correct

Ans. B.

The light weight concrete is prepared by Formation of air voids in cement by omitting sand. Light weight concrete used for thermal insulation in the concrete. And used where load reduction is required.

51. Addition of calcium chloride in concrete results in \_\_\_\_\_.

- A. Increased strength
- B. Reduction in curing period
- C. Retardation of loss of moisture
- D. All option are correct

Ans. A.

Addition of calcium chloride in concrete results in decrease in setting time. It is an accelerator. Which increase the early strength of concrete.

52. Modulus of elasticity for concrete improves by \_\_\_\_\_.

- A. Shorter curing period
- B. Age
- C. Higher W.C. ratio
- D. All options are correct

Ans. A.

Modulus of elasticity for concrete improves by shorter curing period. Higher water cement ratio increase shrinkage which ultimately reduces the strength of concrete and also modulus of elasticity

53. Minimum number of test specimens required for finding the compressive strength of concrete are \_\_\_\_\_.

- A. 3
- B. 5
- C. 6
- D. 9

Ans. C.

Minimum number of test specimens required for finding the compressive strength of concrete are 6

54. Too wet concrete may cause \_\_\_\_\_.

- A. Segregation
- B. Lower density
- C. Weakness of concrete
- D. All options are correct

Ans. A.

Too wet concrete leads to segregation.

Segregation=sapration of coarse aggregate from cement.

55. Curing period is minimum for concrete using \_\_\_\_\_.

- A. Rapid hardening cement
- B. Low heat cement
- C. Ordinary Portland cement
- D. Slag cement

Ans. C.

Curing period is minimum for concrete using Ordinary Portland cement

Rapid hardening cement requires more curing due to more heat of hydration in shorter time which may leads to shrinkage.

56. If 50 kg of fine aggregates and 100 kg of coarse aggregates are mixed in a concrete whose water cement ration is 0.6, the weight of water required for harsh mix is \_\_\_\_\_.

- A. 8 kg
- B. 10 kg
- C. 12 kg
- D. 14 kg

Ans. C.

the weight of water required for harsh mix is 12 kg. this arbitrary M15 type concrete in which proportion is 1:2:4, in this case the cement content is 25 kg. and 50 kg of cement requires approx. 23 kg of water so for 25 kg it will be approx. 12 kg.

57. In a mix if the desired slump is not obtained, the adjustment for each concrete slump difference is made by adjusting water content by \_\_\_\_\_.

- A. 0.25
- B. 0.5%
- C. 0.75%
- D. 1%

Ans. B.

the adjustment for each concrete slump difference is made by adjusting water content by 0.5%

58. In case of hand mixing of concrete, the extra cement to be added is \_\_\_\_\_.

- A. 5%
- B. 10%
- C. 15%
- D. 20%

Ans. B.

As per IS code In case of hand mixing of concrete, the extra cement to be added is 10%

59. If the size of panel in a flat slab is 6m×6m, then as per Indian Standard code the width of column strip and middle strip are \_\_\_\_\_.

- A. 3.0 m and 1.5 m
- B. 1.5 m and 3.0 m
- C. 3.0 m and 3.0 m
- D. 1.5 m and 1.5 m

Ans. B.

as per Indian Standard code the width of column strip and middle strip are length/4 and width/4 = 1.5 m and 1.5 m respectively.

60. In counter fort type retaining walls

- A) The vertical slab is designed as a continuous slab
- B) The heel slab is designed as a continuous slab
- C) The vertical slab is designed as a cantilever
- D) The heel slab is designed as a cantilever

- A. A and B                      B. A and D
- C. B and C                      D. C and D

Ans. A.

In counter fort type retaining walls both vertical slab and heel slab designed as a continuous slab (not as cantilever).

61. Percentage of steel for balanced design of a singly reinforced rectangular section by limit state method depends on

- A) Characteristic strength of concrete
- B) Yield strength of steel
- C) Modulus of elasticity of steel
- D) Geometry of the section

- A. Only B                      B. A, B and D
- C. B, c and D                D. A, B and C

Ans. B.

Percentage of steel for balanced design of a singly reinforced rectangular section by limit state method depends on Characteristic strength of concrete, Yield strength of steel and geometry of section

62. Deep beams are designed for \_\_\_\_\_.

- A. Shear force only
- B. Bending moment only
- C. Both shear force and bending moment
- D. Bearing

Ans. C.

Deep beams are designed for both shear stress and bending moment

63. The loss of pre-stress due to shrinkage of concrete is the product of \_\_\_\_\_.

- A. Modular ratio and percentage of steel
- B. Modulus of elasticity of concrete and shrinkage of concrete
- C. Modulus of elasticity of steel and shrinkage of concrete
- D. Modular ratio and modulus of elasticity of steel

Ans. C.

The loss of pre-stress due to shrinkage of concrete is the product of Modulus of elasticity of steel and shrinkage of concrete.

64. The reduction coefficient of a reinforced concrete column with an effective length of 4.8 m and size

$250 \times 300 \text{mm}^2$  is \_\_\_\_\_.

- A. 0.8                              B. 0.85
- C. 0.9                              D. 0.95

Ans. B.

Reduction coefficient  $C_r = (1.25 - L_{eff}/48B)$

$L_{eff} = 4.8 \text{ m}$  and  $B = 250 \text{ mm}$

So  $C_r = 0.85$

65. From limiting deflection point of view, use of high strength steel in RC beam results in \_\_\_\_\_.

- A. Reduction in depth
- B. No change in depth
- C. Increase in depth
- D. Increase in width

Ans. C.

From limiting deflection point of view, use of high strength steel in RC beam results in Increase in depth.

66. The assumption that the plane sections normal before bending remains normal after bending is used

- A. only in the working stress method of design
- B. only in the limit-state method of design
- C. in both working stress and limit state methods of design
- D. only in the ultimate load method of design

Ans. C.

The assumption that the plane sections normal before bending remains normal after bending is used in both working stress and limit state methods of design, because it assumed that strain is varying linearly across the section.

67. Which one of the following statements is correct?

- A. Shear cracks start due to high diagonal tension in case of beams with their webs and high pre-stressing force.
- B. Shear design for a pre-stressed concrete beam is based on elastic theory
- C. In the zone where bending moment is dominant and shear is insignificant, cracks occur at  $20^\circ$  to  $30^\circ$ .
- D. After diagonal cracking, the mechanics of shear transfer in a pre-stressed concrete member is very much different from that in reinforced concrete members.



Ans. B.

Shear cracks is not due to high pre-stressing force, Shear design for a pre-stressed concrete beam is based on elastic theory.

68. Partial safety for concrete and steel are 1.5 and 1.15 respectively, because \_\_\_\_\_.

- A. Concrete is heterogeneous while steel is homogeneous
- B. The control on the quality of concrete is not as good as that of steel
- C. Concrete is weak in tension
- D. Voids in concrete are 0.5% while those in steel are 0.15%

Ans. B.

Partial safety for concrete and steel are 1.5 and 1.15 respectively, because control on the quality of concrete is not as good as that of steel.

69. The diameter of a rivet connecting plate of thickness 16 mm given by Unwin's formula is \_\_\_\_\_.

- A. 28 mm
- B. 24 mm
- C. 22 mm
- D. None of these

Ans. B.

By unwin's formula  $d = 6.0 \times \sqrt{t} = 24 \text{ mm}$   
 $t =$  thickness of plate

70. Fillet weld is not recommended if the angle between fusion faces is \_\_\_\_\_.

- A) Less than  $45^\circ$
- B) Greater than  $120^\circ$
- C) less than  $60^\circ$
- D) Greater than  $145^\circ$

The correct statements are

- A. A and B
- B. A and D
- C. B and C
- D. C and D

Ans. C.

As per IS :800

Fillet weld is recommended the angle between fusion faces are  $60^\circ$  to  $120^\circ$

71. The slenderness ratio of lacing bars should not exceed

- A. 100
- B. 120
- C. 180
- D. 145

Ans. D.

The slenderness ratio of lacing bars should not exceed to 145

72. If 18 mm rivets are used in lacing bars, then minimum width of lacing bars should be

- A. 45 mm
- B. 50 mm
- C. 55 mm
- D. 60 mm

Ans. C.

| Dia of rivets | min. width of lacing bars |
|---------------|---------------------------|
| 16mm          | 50mm                      |
| 18mm          | 55mm                      |
| 20mm          | 60mm                      |
| 22mm          | 65mm                      |

73. In double riveted double covered butt joint, the strength of the joint per pitch length in shearing the rivets 'n' times the shear strength of one rivet in single shear, where n is equal to \_\_\_\_\_.

- A. 1
- B. 2
- C. 3
- D. 4

Ans. B.

In double riveted double covered butt joint, the strength of the joint per pitch length in shearing the rivets 'n' times the shear strength of one rivet in single shear, where n is equal to two, number of riveted joints n time of rivet in single shear.

74. Splice covers and its connection in a tension member should be designed

- A. To develop net tensile strength of main member
- B. To carry 50% load of main member
- C. In tension member splices are not recommended
- D. To carry 33(1/4)% load of main member

Ans. A.

Splice covers and its connection in a tension member should be designed To develop net tensile strength of main member.

75. Apart from gravity loads which if the following loads are also considered in the design of a gantry girder located within an industrial building?

- A) Wind load
- B) Longitudinal load
- C) Lateral load

Select the answer using the codes given below

- A. A and B
- B. A and C
- C. B and C
- D. A, B and C

Ans. C.

Apart from gravity lateral and longitudinal loads are also considered in the design of a gantry girder located within an industrial building.

76. If the pitch is 6 cm and rivet value is 4 tonnes, the number of rivets required for a riveted connection carrying an eccentric load of 15 tonnes at 30 cm from the centre line is \_\_\_\_\_.

- A. 6
- B. 8
- C. 10
- D. 12

Ans. B.

It is the question of bracket connection so in this connection same no. of rivets are required on each flange to connect the bracket.

So each side required. Rivets are =  $15/4 = 3.75 = 4$  rivets each side, so total no. of rivets required both side for connection are = 8.

77. A welded steel plate girder consisting of two flange plates of  $350 \times 16$  mm and a web plate of  $1000 \text{ mm} \times 6$  mm requires \_\_\_\_\_.

- A. No stiffeners
- B. Vertical stiffeners
- C. Intermediate vertical stiffeners
- D. Vertical and horizontal stiffeners

Ans. C.

Flange plate in between 250 to 400 so intermediate vertical stiffeners required.

78. The common assumption that all rivets share equally a non-eccentric load is valid at a load \_\_\_\_\_.

- A. Below the working load
- B. Equal to the working load
- C. Above the working load
- D. Equal to the failure load

Ans. B.

The common assumption that all rivets share equally a non-eccentric load is valid at a load. Equal to the working load.

79. Deposit gauge are provided with copper sulphate solution \_\_\_\_\_.

- A. to prevent the growth of bacteria
- B. to prevent the growth of algae
- C. to scare birds
- D. to prevent the decomposition of SPM

Ans. B.

Deposit gauge are provided with copper sulphate solution to prevent the growth of algae. Copper sulphate solution provide corrosion resistance which leads to prevention of growth of algae.

80. Greenhouse effect of  $\text{CO}_2$  is \_\_\_\_\_.

- A. Permitting the outside solar radiation to reach the ground but preventing terrestrial radiation from the ground into the space
- B. permitting the solar radiation of short length and reradiated terrestrial heat of long wave length
- C. reflecting the heat rays into the space thereby keeping the temperature of earth unaffected
- D. causing absorption of heat from troposphere and thereby decreasing the temperature of earth with increase in  $\text{CO}_2$  concentration

Ans. A.

Greenhouse effect of  $\text{CO}_2$  is Permitting the outside solar radiation to reach the ground but preventing terrestrial radiation from the ground into the space due to which  $\text{CO}_2$  increases the temperature of earth drastically and leads to melting of snow from glaciers.

81. Identify the process responsible for the formation of sedimentary rocks.

- A. Solidification of molten mass of silicates below or at the surface of the earth
- B. changes in texture or mineral composition or both of igneous and sedimentary rocks due to high temperature and heavy pressure
- C. deposited layers of sand and silt subjected enormous overburden pressures over geological times
- D. None of the option

Ans. C.

The process responsible for sedimentary rock formation are deposited layers of sand and silt subjected enormous overburden pressures over geological times.

Igneous formation of rock are Solidification of molten mass of silicates below or at the surface of the earth.

The process of meta morphic rock formation are changes in texture or mineral

composition or both of igneous and sedimentary rocks due to high temperature and heavy pressure.

82. Pegmatite is an example of

- A. sedimentary rock
- B. extrusive igneous rock
- C. intrusive igneous rock
- D. metamorphic rocks

Ans. C.

Pegmatite is an example of intrusive igneous rock

83. Most of the stones possess the specific gravity in the range of \_\_\_\_\_.

- A. 1 to 1.5
- B. 1.5 to 2.0
- C. 2.4 to 2.8
- D. 3 to 4

Ans. C.

Most of the stones possess the specific gravity in the range of 2.4 to 2.8

84. The indentation provided in the face of the brick is called \_\_\_\_\_.

- A. frog
- B. pallet
- C. strike
- D. None of the these

Ans. A.

The indentation provided in the face of the brick is called frog. It provides shear joints with mortar and also consist of trader name on it.

85. Terra cotta, in buildings, is used for \_\_\_\_\_.

- A. insulation
- B. ornamental work
- C. sewage lines
- D. sanitary services

Ans. B.

Terra cotta, in buildings, is used for ornamental work.

86. The Paints that are most resistant to fire are \_\_\_\_\_.

- A. enamel paints
- B. aluminium paints
- C. asbestos paints
- D. cement paints

Ans. C.

The Paints that are most resistant to fire are asbestos paints.

87. The sub-classification of sedimentary rocks \_\_\_\_\_.

- A. volcanic and plutonic
- B. mechanical, chemical organic
- C. intrusive, extrusive
- D. stratified, un-stratified

Ans. B.

The sub-classification of sedimentary rocks are mechanical, chemical organic And for igneous intrusive, extrusive.

88. The separation of water on the fresh concrete is known as \_\_\_\_\_.

- A. segregation
- B. hydration
- C. bleeding
- D. None of the these

Ans. C.

The separation of water on the fresh concrete is known as bleeding and separation of coarse aggregate is known as segregation.

89. The purpose of the soundness test of cement \_\_\_\_\_.

- A. to determine the presence of free lime
- B. to determine the setting time
- C. to determine the sound proof quality of cement
- D. to determine the fineness

Ans. A.

The purpose of the soundness test of cement determine the presence of free lime. Free lime expands in volume on addition of water in to concrete.

90. Distemper is used on \_\_\_\_\_.

- A. plastered surface not exposed to weather
- B. plastered surface exposed to weather
- C. roof tops
- D. un-plastered brick wall

Ans. B.

Distemper is used on plastered surface not exposed to weather directly.

91. A layer of dry bricks put below the foundation concrete, in the case of soft soils, is called \_\_\_\_\_.

- A. soling
- B. shoring
- C. D.P.C.
- D. None of these

Ans. A.

A layer of dry bricks put below the foundation concrete, in the case of soft soils, is called brick soling.

92. In the analysis of rates, the profit for the contractor is generally taken as \_\_\_\_\_.

- A. 20%
- B. 15%
- C. 10%
- D. 5%

Ans. C.

In the analysis of rates, the profit for the contractor is generally taken as 10%

93. The information which cannot be included in drawings is conveyed to the estimator through \_\_\_\_\_.

- A. specifications
- B. cover note
- C. progress chart
- D. None of the these

Ans. A.

The information which cannot be included in drawings is conveyed to the estimator through specifications

94. Of the total estimated cost of a building, the cost of electrification usually accounts for \_\_\_\_\_.

- A. 1%                                      B. 5%
- C. 8%                                        D. 20%

Ans. C.

Of the total estimated cost of a building, the cost of electrification usually accounts for 8%

95. Indicating works left in excavated trenches to facilitate the measurement of borrow pits are known as \_\_\_\_\_.

- A. jambs
- B. posts
- C. tell-tale
- D. None of the these

Ans. C.

Indicating works left in excavated trenches to facilitate the measurement of borrow pits are known as tell-tale.

96. In case of steel rolling shutters, for the estimation of painted area, the plain area is multiplied by \_\_\_\_\_.

- A. 0.75                                      B. 1.1
- C. 1.25                                        D. 1.5

Ans. B.

In case of steel rolling shutters, for the estimation of painted area, the plain area is multiplied by economical depth which is 1.1.

97. The weight of 10 mm diameter mild steel rod per metre length is equal to \_\_\_\_\_.

- A. 0.22 kg                                      B. 0.32 kg
- C. 0.42 kg                                        D. 0.62 kg

Ans. D.

This given by  $d^2/162=0.62$  kg

98. Specifications for the hold fasts are given in terms of \_\_\_\_\_.

- A. number                                      B. weight
- C. volume                                        D. length

Ans. B.

Specifications for the hold fasts are given in terms of weight.

99. The floor slab of a building is supported on reinforced cement floor beams. The ratio of the end and intermediate spans is kept at \_\_\_\_\_.

- A. 0.7    B. 0.8
- C. 0.9    D. 0.6

Ans. C.

The floor slab of a building is supported on reinforced cement floor beams. The ratio of the end and intermediate spans is kept at 0.9

100. For a continuous floor slab supported on beams, the ratio of end span length and intermediate span length is \_\_\_\_\_.

- A. 0.6    B. 0.7
- C. 0.8    D. 0.9

Ans. D.

For a continuous floor slab supported on beams, the ratio of end span length and intermediate span length is 0.9.

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