

1. The standard size of brick as per Indian standards is \_\_\_\_\_.

- A. 20 cm x 10 cm x 10 cm
- B. 23 cm x 12 cm x 8 cm
- C. 19 cm x 9 cm x 9 cm
- D. 18 cm x 9 cm x 9 cm

Correct Answer: C

Sol:

The standard or modular size of brick

19 cm x 9 cm x 9 cm

Nominal size= 20cm x 10cm x10cm

Conventional size=25cm x 15 cm x 7.5cm

2. The quick lime as it comes from kiln is called\_\_\_\_\_.

- A. Milk lime
- B. hydraulic lime
- C. Lump lime
- D. Hydrated lime

Correct Answer: C

sol

Quick lime as it comes from called lump lime.it is more susceptible to hygroscopic nature

3. How does the seasoning of timber help?

- A. It increases the weight of timber
- B. It improves the strength properties of timber

- A. Only A
- B. Only B
- C. Both A and B
- D. None of these

Correct Answer: B

Sol:

Seasoning means removal of extra moisture from the timber,as the result of seasoning weight of timber decreases and strength increases

4. The ductility value of bitumen is \_\_\_\_\_.

- A. Equal to that of tar
- B. More than that of tar
- C. Less than that of tar
- D. None of these

Correct Answer: C

Sol:

Ductility value of bitumen (minimum) is 75 while tar have more than the bitumen.

5. The penetration test on bitumen is used for determining its \_\_\_\_\_.

- A. Grade
- B. Ductility
- C. Viscosity
- D. None of these

Correct Answer: A

Sol: Penetration test is determine the grade of bitumen

6. Quartzite is a \_\_\_\_\_.

- A. Sandy rock
- B. Siliceous rock
- C. Organic rock
- D. Calcareous rock

Correct Answer: B

Sol: Quartzite is the parent material of siliceous rock And for calcareous rock, keolinite,illite and montmorilonite are the parent materials

7. Plaster of Paris can be obtained from the calcinations of \_\_\_\_\_.

- A. Lime stone
- B. Gypsum
- C. Dolomite
- D. Bauxite

Correct Answer: B

Sol:

On calcinations of gypsum the extra moisture removed and it converted into plaster of paris

8. A brick masonry could fail due to \_\_\_\_\_.

- A. Rupture along a vertical joint in poorly bonded walls
- B. Shearing along a horizontal plane
- C. Crushing due to overloading
- D. Any of these

Correct Answer: D

Sol:

All the are correct. Brick masonry weak about poorly bonded vertical joints, shearing along horizontal plane, and some time crushed by over loading

9. Which of the following statements is correct?

- A. Excess of alumina in the clay makes the brick brittle and weak.
- B. Excess of alumina in the clay makes the brick crack and warp on drying.
- C. Excess of alumina in the clay leaves high power deposit on the brick.
- D. Excess of alumina in the clay improves impermeability and durability of the brick.

Correct Answer: B

Sol:

Alumina impart plasticity characteristics in brick,if its content more the brick having cracking and warping on dying

10. The compressive strength of 100 mm cube as compared to 150 mm cube is always \_\_\_\_\_.

- A. less
- B. more
- C. equal
- D. None of these

Correct Answer: B

Sol:

The smaller the size of cube it more close to its parent geometry.

11. Which of the following is the most correct estimate?

- A. Plinth area estimate
- B. Cube rate estimate
- C. Detailed estimate
- D. Building cost index estimate

Correct Answer: C

Sol: detailed estimate is the most accurate estimate after that plinth area estimate is good estimate.

12. The technique of finding the fair price of an existing building or property is known as \_\_\_\_\_.

- A. Estimation
- B. Valuation
- C. Pricing
- D. Costing

Correct Answer: B

Sol:

To find fair price of any property it needs valuation.

13. The value of the property (without being dismantled) at the end of the useful life period is known as \_\_\_\_\_.

- A. Scrap value
- B. Salvation value
- C. Junk value
- D. Book value

Correct Answer: B

Sol:

Without dismantling the value of property is known as salvage value, and after dismantling it is known as scrap value

14. The value of the dismantled material less the cost of dismantling is called \_\_\_\_\_.

- A. Scrap value
- B. Salvation value
- C. Rateable value
- D. None of these

Correct Answer: A

15. The plan of a building is in the form of a rectangle with centre line dimensions of outer walls as 14.7m×9.7m. The thickness of the wall in super structure is 0.30 m. What is the floor area of the building?

- A. 143 m<sup>2</sup>
- B. 139 m<sup>2</sup>
- C. 152 m<sup>2</sup>
- D. None of these

Correct Answer: D

Sol:

Floor area of building will be  $(14.7+0.3) \times (9.7+0.3)=150\text{m}^2$

16. If the bearing is not specified for the lintel, in the estimation it is usually taken as \_\_\_\_\_.

- A. thickness of lintel subjected to a minimum value of 12 cm
- B. 3/4 of lintel thickness or 12 cm whichever is larger
- C. 1/2 of lintel thickness
- D. 15 cm

Correct Answer: A

Sol:

If bearing is not specified then its minimum value should be taken, thickness of lintel subjected to a minimum value of 12 cm

17. In the estimation of plastering surface the deductions are not made for \_\_\_\_\_.

- A. ends of beams
- B. ends of rafters

C. small openings upto 0.5 m<sup>2</sup>

D. None of these

Correct Answer: C

Sol:

In estimation of plastering surface the deduction are not made for small opening up to 0.5 m<sup>2</sup>

18. The approximate volume of cement required to prepare 100 m<sup>3</sup> of 1:2:4 concrete is \_\_\_\_\_.

- A. 16 m<sup>3</sup>
- B. 32 m<sup>3</sup>
- C. 25 m<sup>3</sup>
- D. 21 m<sup>3</sup>

Correct Answer: D

Sol:

For 1 m<sup>3</sup> the volume of concrete=  $(1.5 \times 1)/(1+2+3)=0.2142$

So for 100m<sup>3</sup> ,  $0.2142 \times 100= 21.42\text{m}^3$

19. Whenever the whitewashing or distempering is done on corrugated iron sheets, in the estimation the plan area of the sheets is increased by \_\_\_\_\_.

- A. 2%
- B. 7%
- C. 10%
- D. 14%

Correct Answer: D

Sol:

Due to corrugation the plan area estimate increase by 14%

20. When actual cost of construction plus certain profit is paid to the contractor then such a contract is known as \_\_\_\_\_.

- A. Unscheduled contract
- B. Nominated contract
- C. Cost plus percentage contract
- D. Work order

Correct Answer: C

Sol:

Cost and profit to contractor is defined as percentage contract

21. Closed contours with higher value inside represents a \_\_\_\_\_.

- A. depression
- B. hill
- C. plain surface
- D. none of these

Correct Answer: B

Sol:

Higher value inward denotes hill while higher value outward denotes valley.

22. In a theodolite the line of collimation is \_\_\_\_\_.

- A. Parallel to axis of plate levels
- B. Parallel to the vertical axis
- C. Perpendicular to the trunnion axis
- D. Parallel to the horizontal axis

Correct Answer: C

Sol:

The line of collimation is perpendicular to turnion axis in the theodolite surveying.

23. How does the size of the theodolite specified ?

- A. By the length of telescope
- B. By the diameter of vertical circle
- C. By the diameter of upper plate
- D. By the diameter of lower plate

Correct Answer: D

Sol:

Size of theodolite is determined by the dia meter of the lower plate

24. In the surveys, the slope correction applied to the base line is \_\_\_\_\_.

- A. Always cumulative
- B. Always Compensating
- C. sometimes cumulative, sometimes compensating
- D. None of these

Correct Answer: A

Sol:

Slope correction for base line always cumulative because its prevent the accumulation of error.

25. Contour interval on map sheet denotes \_\_\_\_\_.

- A. Vertical distance of Contour lines above the datum plane
- B. Vertical distance between two successive contour lines
- C. slope distance between two successive Contour lines
- D. horizontal distance between two successive Contour lines

Correct Answer: B

Sol:

Vertical distance between two successive contour lines shows thw contour interval, while horizontal distance shows the slope difference.

26. Which of the following is the correct meaning of the term 'level line' in surveying?

- A. The line parallel to the mean spheroidal surface of earth.
- B. The line is horizontal.
- C. The line passing through the centre of cross-hairs and the centre of the eye piece.
- D. The line passing through the objective lens and the eye piece of a dumpy or tilting level

Correct Answer: A

Sol:

When we consider the level line it means line parallel to the mean spheroidal surface of earth.

27. The type of surveying in which the curvature of the earth is taken into account is called \_\_\_\_\_.

- A. Geodetic surveying
- B. Plane surveying
- C. Preliminary surveying
- D. Topographical surveying

Correct Answer: A

Sol:

In which surveying the earth curvature is considered is known as geodetic surveying and in

which earth curvature not consider is known as plane surveying.

28. The method of leveling used to carry out reconnaissance of area is :

- A. Check leveling
- B. Fly leveling
- C. Profile leveling
- D. Simple leveling

Correct Answer: B

Sol:

Reconnaissance include the fly leveling, it the pre information before the detailed surveying work takes place.

29. In a closed traverse \_\_\_\_\_.

- A. difference between fore-bearing and back-bearing should be  $90^\circ$
- B. sum of included angles should be  $(2N-4)$  times right angle, where N represents the number of sides
- C. sum of included angles should be  $(2N-1)$  times right angle, where N is the number of sides
- D. None of these

Correct Answer: B

Sol:

For a closed traverse it should be sum of included angles  $(2N-4)$  times right angle, where N represents the number of sides

$$[(2N-4) \times 90^\circ]$$

30. The Horizontal angle which the true meridian makes with magnetic meridian is called \_\_\_\_\_.

- A. Magnetic declination
- B. True declination
- C. Dip
- D. Azimuth

Correct Answer: A

Sol:

Magnetic declination is defined as the angle between true meridian and magnetic meridian.

31. The void ratio of a soil sample having a porosity of 0.32 and a moisture content of 25% will be \_\_\_\_\_.

- A. 0.33
- B. 0.47
- C. 0.78
- D. 1.28

Correct answer: B

Sol:

$$e = n/(1-n) = 0.47$$

where n= porosity

e = void ratio

32. A loose uniform sand with rounded grains has effective grain size of 0.05 cm. Co-efficient of permeability of the sand is \_\_\_\_\_.

- A. 0.25 cm/sec
- B. 0.5 cm/sec
- C. 1 cm/sec
- D. 1.25 cm/sec

Correct Answer: A

Sol:

Coefficient of permeability given by allen-hazen formula  $K=CD^2=0.25 \text{ cm/sec}$

Where  $c = \text{constant}=100$

$D = \text{effective grain size}$

33. Which of the following factor(s) can affect the bearing capacity of the soil?

A. Grain size of the soil

B. Shape of footing

C. Size of the footing

D. All option are correct

Correct Answer: D

Sol:

Factor affecting the bearing capacity are Grain size of the soil, Shape of footing, Size of the footing.

34. Which of the following soils has the uniformity coefficient of more than 10?

A. Well graded soil

B. Coarse soil

C. Uniform soil

D. Poor soil

Correct Answer: A

sol:

Uniformity coefficient( $C_u$ ) > 10 for well graded soil, as we know that  $C_u > 4$  for coarse sand soil and  $C_u > 6$  for sandy soil.

35. An odd shaped body weighing 7.5 kg and occupying 0.01 cubic metre volume will be completely submerged in a fluid having specific gravity of \_\_\_\_\_.

A. 1

B. 1.2

C. 0.8

D. 0.75

Correct Answer: D

Sol:

Mass= volume x density

$7.5 = 0.01 \times \text{density}$

Density =  $750 \text{ kg/m}^3$

Specific gravity (s) = density/density of standard liquid

So  $s = 750/1000=0.75$

36. A ship's model of scale 1:100 had a wave resistance of 1 N at its design speed. The corresponding wave resistance (in N) in prototype will be \_\_\_\_\_.

A. 100

B. 10000

C. 1000000

D. 1000

Correct Answer: C

Sol:

The correct wave resistance in proto type  $n^3 = (100)^3 = 1000000$

37. If the capillary rise of water in a 1 mm diameter tube is 3 cm, the height of capillary rise of water in a 0.2 mm diameter tube in centimeter will be

A. 1.5

B. 7.5

C. 15

D. 75

Correct Answer: C

Sol:

Capillary rise (h) =  $4\sigma \cos/\gamma d$

$h \propto 1/d$

$h_1/h_2 = d_2/d_1$

$h_2 = 15$

38. The pressure intensity is same in all directions at a point in a fluid \_\_\_\_\_.

A. only when fluid is frictionless and incompressible

B. only when fluid is frictionless and is at rest

C. only when fluid is frictionless

D. when there is no relative motion of one fluid layer relative to other

Correct Answer: D

Sol:

When fluid in static medium means when there is no relative motion of one fluid layer relative to other.

39. Flow at constant rate through a tapering pipe is \_\_\_\_\_.

A. steady and uniform flow

B. steady and non-uniform flow

C. unsteady and uniform flow

D. unsteady and non-uniform flow

Correct Answer: B

Sol:

Velocity changes with respect to space so steady and non-uniform flow

40. The motion of air mass in a tornado is a \_\_\_\_\_.

A. free vortex motion

B. forced vortex motion

C. free vortex at centre and forced vortex outside

D. forced vortex at centre and free vortex outside

Correct Answer: D

Sol:

motion of air mass in a tornado is a forced vortex at centre and free vortex outside

41. Apart from inertial force, which of the following forces is most important in motion of submarines under water?

A. viscous force

B. gravity force

C. compressive force

D. surface tension force

Correct Answer: A

Sol:

Viscosity force provide the required drag to the submarines to motion.

42. When an ideal fluid flows past a sphere \_\_\_\_\_.  
A. highest intensity of pressure occurs around the circumference at right angle to direction of flow  
B. lowest pressure intensity occurs at front stagnation point  
C. lowest pressure intensity occurs at rear stagnation point  
D. total drag is zero

Correct Answer: D

Sol:

Total drag is zero because in ideal fluid have no viscosity and no surface tension.

43. Which of the following fluids can be classified as non-Newtonian?

- A. Kerosene oil and Diesel oil
- B. Human blood and Toothpaste
- C. Diesel oil and Water
- D. Kerosene and Water

Correct Answer: B

Sol:

Human blood and Toothpaste

Is ideal bingham fluid. It does not shows the straight line curve passing through origin.

44. In the selection of turbine by specific speed or head, which one of the following statements is not correct?

- A. For specific speed 10-35, Kaplan turbines
- B. For specific speed 60-300, Francis turbines
- C. For head above 300 m, Francis turbines
- D. For head above 300 m, Pelton wheel

Correct Answer: A

Sol:

For specific speed 10-35, Kaplan turbines. this statement is not correct regarding the Kaplan turbine

45. The field irrigation requirements is computed as \_\_\_\_\_.

- A. Consumptive use + field application losses
- B. Net irrigation requirement + field application losses
- C. Net irrigation requirement + conveyance losses
- D. Consumptive use + conveyance losses

Correct Answer: B

Field irrigation requirement is the need of total water = crop consumptively used + leaching requirement + field application losses.

consumptively used + leaching requirement is also known as net irrigation requirement.

46. Rainfall hyetograph shows the variation of \_\_\_\_\_.

- A. Cumulative rainfall with time
- B. Rainfall intensity with time
- C. Rainfall depth over an area
- D. Rainfall intensity with time cumulative rainfall

Correct Answer: B

Sol:

Rainfall hyetograph shows the variation with rainfall intensity with time.

While hydrograph shows the discharge or runoff with time.

47. Due to slipping of the wheels the rail forms \_\_\_\_\_.

- A. Crushed head
- B. Battered ends
- C. Spilt head
- D. Horizontal fissure

Correct Answer: A

Sol:

Due to slipping crushing head formed in the rails.

In rails there are fatigue and creep also form by cyclic and continuous loading respectively.

48. On horizontal curve, if the pavement is kept horizontal across the alignment, then the pressure on the outer wheels will be \_\_\_\_\_.

- A. more than the pressure under inner wheels
- B. less than pressure under inner wheels
- C. equal to the pressure on inner wheels
- D. zero

Correct Answer: A

Sol:

On horizontal curve when no elevation is provided then the centrifugal force act is not balanced by elevation due to which out wheel suffers more pressure than inner wheel.

49. Anaerobic treatment is best suited for \_\_\_\_\_.

- A. High efficiency
- B. Toxic wastes
- C. Dilute inorganic wastes
- D. Strong organic wastes

Correct Answer: D

Sol:

Anaerobic treatment is best suited to Strong organic wastes because it decomposes in the absence of oxygen.

50. Pollutant Standards Index (PSI) value in between 101-199 denotes the air quality as \_\_\_\_\_.

- A. good
- B. moderate
- C. unhealthy
- D. hazardous

Correct Answer: C

Sol:

- 0-50 good
- 51-100 moderate
- 101-150 unhealthy for sensitive group
- 151-200 unhealthy

51. Match List -1 with List -2

List -1

- 1 Young Modulus
- 2 Poisson's ratio
- 3 Bulk Modulus
- 4 Rigidity Modulus

List -2

- A Lateral strain to linear strain within elastic unit
- B Stress strain with elastic limit

- C Shear stress to shear strain within elastic limit  
 D Direct stress to corresponding volumetric strain  
 A. 1-B, 2-A, 3-D, 4-C  
 B. 1-C, 2-A, 3-D, 4-B  
 C. 1-C, 2-D, 3-A, 4-B  
 D. 1-B, 2-D, 3-A, 4-C

Correct Answer: A

Sol:

Young Modulus = Stress strain with elastic limit  
 Poisson's ratio = Lateral strain to linear strain within elastic unit  
 Bulk Modulus = Direct stress to corresponding volumetric strain  
 Rigidity Modulus = Shear stress to shear strain within elastic limit

52. The ratio of young's modulus to modulus of rigidity for a material having Poisson's ratio 0.2 is \_\_\_\_\_.

- A. 2.4  
 B. 0.416  
 C. 0.357  
 D. 2.8

Correct Answer: A

Sol:

$E = \text{young's modulus}$

$G = \text{rigidity modulus}$

$\mu = \text{poisson ratio}$

$E = 2G(1 + \mu)$

$E/G = 2 \times (1 + 0.2) = 2.4$

53. What is the slope at the end of simply supported beam of span 2 m and load 5 kg/unit length over the entire span?

- A.  $1/16 EI$   
 B.  $5/3 EI$   
 C.  $1/3 EI$   
 D.  $1/20 EI$

Correct Answer: B

Sol:

For simply supported UDL slope will be  $WL^3/24EI = 5 \times 2^3/24EI = 5/3EI$

54. A circular shaft is subjected to a torque 'T' which is half of the bending moment applied, then the ratio of maximum bending stress and maximum shear stress is \_\_\_\_\_.

- A. 2  
 B. 4  
 C. 3  
 D. 1.5

Correct Answer: B

Sol:

torque = Half bending moment

$T = 2M, \tau = T \times R/J, \sigma = M \times Y/I$

So  $\sigma/\tau = 4$

55. When both ends of a column are fixed, the crippling load is F. If one end of the column is made free, the value of crippling load will be changed to \_\_\_\_\_.

- A.  $F/4$

- B.  $F/2$   
 C.  $F/16$   
 D.  $4F$

Correct Answer: C

Sol:

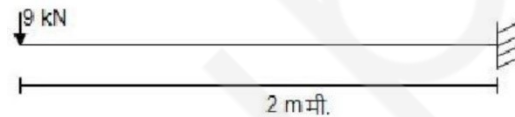
When both end fixed then effective length =  $L/2$

And when made one end free then effective length =  $2L$

Crippling load =  $\pi^2 EI/L^2$

So  $F/2 \times 2 \times 2 \times 2 = F/16$

56. A cantilever beam is shown in the figure. Find the magnitude and direction of moment to be applied at free end for zero vertical deflection.



- A. 9 kNm clockwise  
 B. 9 kNm anti-clockwise  
 C. 12 kNm clockwise  
 D. 12 kNm anti-clockwise

Correct Answer: B

Sol:

9 kNm anti-clockwise to counteract the zero deflection on free end

57. What will be the relation between E (Young's modulus of Elasticity) and K (bulk modulus), when Poisson's ratio is 0.25?

- A.  $E = K$   
 B.  $E = 2K$   
 C.  $E = 1.5 K$   
 D.  $E = K = 0$

Correct Answer: C

Sol:

$E = 3K(1 - 2\mu) = 1.5K$

58. Moment of Inertia of a triangular section, about an axis passing through its center of gravity is \_\_\_\_\_.

- A.  $bh^3/12$   
 B.  $bh^3/36$   
 C.  $bh^3/32$

Correct Answer: B

Sol:

From center of gravity  $bh^3/36$

And from base  $bh^3/12$

59. The hoop stress induced in a thin cylinder by winding it with wire under tension will be \_\_\_\_\_.

- A. compressive  
 B. tensile  
 C. shear  
 D. zero

Correct Answer: A

Sol:

It will be compressive in nature and radial stress generated will be tensile in nature

60. The shape of cable under uniformly distributed horizontal load is \_\_\_\_\_.

- A. parabolic
- B. catenary
- C. circular
- D. triangular

Correct Answer: A

Sol:

Shape will be in parabolic nature as horizontal thrust given  $R = WL^2/8h$

Quadratic curve formed.

61. The strain energy stored in a body due to external loading, within the elastic limit is known as \_\_\_\_\_.

- A. Malleability
- B. ductility
- C. toughness
- D. resilience

Correct Answer: D

Sol:

Strain energy stored in body by external loading within the proportionality limit is known as resilience, resilience is the recoverable strain energy i.e when load is removed then energy is totally removed.

62. The area under stress strain curve represents \_\_\_\_\_.

- A. breaking strength of material
- B. toughness of material
- C. hardness of material
- D. energy required to cause failure

Correct Answer: B

Sol:

Energy stored in the body up to fracture limit is known as toughness, and this energy is equal to area under stress – strain curve.

63. The partial factor of safety for concrete as per IS 456-2000 \_\_\_\_\_.

- A. 1.5
- B. 1.15
- C. 0.87
- D. 0.466

Correct Answer: A

Sol: The partial factor of safety for concrete as per IS 456-2000 is 1.5

And for steel 1.15

64. Approximate ratio of the strength of the cement concrete of 7 days to that of 28 days is \_\_\_\_\_.

- A. 0.56
- B. 0.85
- C. 1
- D. 1.15

Correct Answer: A

Sol:

As per IS CODE 456:2000

Approximate ratio of the strength of the cement concrete of 7 days to that of 28 days is = 0.56

At 7 days approximate 70% of ultimate strength gain occurs in concrete.

65. Durability of concrete is proportional to \_\_\_\_\_.

- A. sand content
- B. water-cement ratio
- C. aggregate ratio
- D. cement-aggregate ratio

Correct Answer: D

Sol:

Durability of concrete is proportional to cement-aggregate ratio

While water cement ratio inversely proportional to strength.

66. The Young's modulus of concrete ( $E_c$ ) is given by \_\_\_\_\_.

- A.  $1000 f_{ck}$
- B.  $5000 \sqrt{f_{ck}}$
- C.  $5000 f_{ck}$
- D.  $1000 \sqrt{f_{ck}}$

Correct Answer: C

Sol:

As per IS 456:2000

Modulus of elasticity of concrete is  $5000 \sqrt{f_{ck}}$ , in this effect of temperature and creep also considered .

67. Low temperature during concrete laying \_\_\_\_\_.

- A. increases strength
- B. decreases strength
- C. has no effect on strength
- D. depends on other factors

Correct Answer: A

sol:

Low temperature increases the strength of concrete because it make available the moisture to the concrete.

68. Water cement ratio is generally expressed in volume of water required per \_\_\_\_\_.

- A. 10 kg
- B. 20 kg
- C. 30 kg
- D. 50 kg

Correct Answer: D

Sol:

Water cement ratio is generally expressed in volume of water required per 50 kg, it is generally due to the weight of one bag of cement 50 kg.

69. The entrained air in concrete \_\_\_\_\_.

- A. increases workability
- B. decreases workability
- C. increases strength
- D. None of these

Correct Answer: A

Sol:

The air entrainment increases the workability of concrete, air entrainment agents are aluminum powder, vegetable oil etc. it also helps in resisting the freezing and thawing action.

70. Poisson's ratio for concrete \_\_\_\_\_.

- A. increases with richer mix
- B. decreases with richer mix
- C. remains constant
- D. None of these

Correct Answer: A

Sol:

Poisson ratio increases with richer mixture, in richer mixture lateral shrinkage are more than lean mixture,

Poisson ratio= lateral strain/ longitudinal strain

71. The test most suitable for concrete of very low workability is \_\_\_\_\_.

- A. Slump test
- B. Compaction factor test
- C. Vee-Bee test
- D. All option are correct

Correct Answer: C

Sol:

The test most suitable for concrete of very low workability is Vee-Bee test.

Slump test are used for very high workable mixture, and compaction factor for moderate workable mixture.

72. The design shear stress in reinforced cement concrete depends on-

- A. Characteristic strength of concrete
  - B. Percentage of longitudinal tensile reinforcement
  - C. Characteristic strength of steel
- A. Only A
  - B. Only B
  - C. Only C
  - D. Both A and B

Correct Answer: A

Sol:

The design shear stress in reinforced cement concrete depends on Characteristic strength of concrete and percentage of steel.

73. The strength and quality of concrete depends on -

- A. aggregate shape
- B. aggregate grading
- C. surface area of the aggregate
- D. All options are correct

Correct Answer: D

Sol:

The strength and quality of concrete depends on aggregate shape, aggregate grading, surface area of the aggregate

74. In the conventional pre-stressing, the diagonal tension in concrete \_\_\_\_\_.

- A. increases
- B. decreases
- C. does not change

D. may increase or decrease

Correct Answer: B

Sol:

In the conventional pre-stressing, the diagonal tension in concrete decreases, due to induced shear stress in the beam a complimentary shear applied at diagonal to maintain the equilibrium, this complimentary shear creates a diagonal tension, and this tension is neutralized by pre stressing.

75. The approximate allowable stress in axial compression in reinforced concrete is \_\_\_\_\_.

- A.  $0.25 f_{ck}$
- B.  $0.44 f_{ck}$
- C.  $0.33 f_{ck}$
- D.  $0.30 f_{ck}$

Correct Answer: A

Sol:

As per IS456:2000

The approximate allowable stress in axial compression in reinforced concrete is  $0.25f_{ck}$

76. Then tensile strength of concrete to be used in the design of reinforced concrete members is \_\_\_\_\_.

- A.  $0.2 f_{ck}$
- B.  $0.1 f_{ck}$
- C.  $0.7\sqrt{f_{ck}}$
- D. 0

Correct Answer: C

Sol:

As per IS 456:2000

Then tensile strength of concrete to be used in the design of reinforced concrete members is  $0.7\sqrt{f_{ck}}$

Or about to 10% to 15% of compressive strength.

77. The minimum quantity of cement content that is needed in 1 m<sup>3</sup> of a reinforced concrete which is not directly exposed to weather is about (in kg)

- \_\_\_\_\_.
- A. 200
- B. 250
- C. 300
- D. 350

Correct Answer: B

Sol:

As per IS 456:2000

The minimum quantity of cement content that is needed in 1 m<sup>3</sup> of a reinforced concrete which is not directly exposed to weather is about (in kg)= 250

78. The allowable tensile stress in high yield strength deformed steel stirrups used in reinforced cement concrete is (in N/mm<sup>2</sup>)\_\_\_\_\_.

- A. 140
- B. 190



- C. 230
- D. 260

Correct Answer: C

Sol:

The allowable tensile stress in high yield strength deformed steel stirrups used in reinforced cement concrete is =  $230 \text{ N/mm}^2$

In compression  $190 \text{ N/mm}^2$  and for mild steel  $140 \text{ N/mm}^2$

79. M 10 grade of concrete approximates \_\_\_\_\_ mix.

- A. 1 : 3 : 6
- B. 1 : 1 : 2
- C. 1 : 2 : 4
- D. 1 : 1.5 : 3

Correct Answer: A

Sol:

M 10 grade of concrete approximates mix = 1 : 3 : 6

For M15 = 1:2:4

For M20 = 1:1.5:3

80. The process of proper and accurate measurement of concrete ingredients for uniformity of proportion is known as \_\_\_\_\_.

- A. batching
- B. grading
- C. mixing
- D. None of these

Correct Answer: A

Sol:

The process of proper and accurate measurement of concrete ingredients for uniformity of proportion is known as batching, batching refers to the weight proportion of different ingredients of concrete.

81. The slope of curve of S. F. D (Shear Force Diagram) at any section will be equal to \_\_\_\_\_.

- A. the slope of loading at the section
- B. the ordinate of loading diagram at the section
- C. the area of loading diagram from the end to that section
- D. None of these

Correct Answer: B

Sol:

The slope of curve of S. F. D (Shear Force Diagram) at any section will be equal to the ordinate of loading diagram at the section,

As  $dm/dx = \text{shear force}$

And  $ds/dx = \text{loading}$

82. The two criteria for the determination of allowable bearing capacity of a foundation are \_\_\_\_\_.

- A. tensile failure and compression failure
- B. tensile failure and settlement
- C. bond failure and shear failure
- D. shear failure and settlement

Correct Answer: D

Sol:

The two criteria for the determination of allowable bearing capacity of a foundation are shear failure and settlement

83. The working stress (in  $\text{N/mm}^2$ ) for structural steel in tension is the order of \_\_\_\_\_.

- A. 15
- B. 75
- C. 150
- D. 750

Correct Answer: C

Sol:

The working stress (in  $\text{N/mm}^2$ ) for structural steel in tension is the order of 140 to  $230 \text{ N/mm}^2$

So 150 is in the range.

84. If the storey height is equal to length of RCC wall, the percentage increase in strength is \_\_\_\_\_.

- A. 0
- B. 10
- C. 20
- D. 30

Correct Answer: B

Sol:

If the storey height is equal to length of RCC wall, the percentage increase in strength is 10

85. In constructions, why are the lintels preferred to arches?

- A. Arches will not last long
- B. Arches require more head room to span the openings like doors, windows etc.
- C. Arches require strong abutments to with stand arch thrust.
- A. Only A
- B. Only B
- C. Only C
- D. Both B and C

Correct Answer: D

Sol: In constructions lintel are preferred over arches because Arches require more head room to span the openings like doors, windows etc.

Arches require strong abutments to with stand arch thrust.

86. For a design of a simply supported beam under uniformly distributed load \_\_\_\_\_.

- A. check the section at centre for Bending Moment as well as for shear
- B. check the section at centre for Bending Moment and at the support for shear
- C. Check at the centre for shear and at the support for Bending Moment
- D. None of these

Correct Answer: B

Sol:

For design of simply supported beam there are two critical points

1. Bending moment at center of beam
2. Shear forces at support

87. What does the influence line for Bending Moment indicate?

- A. Bending moment at any section on the structure for a given positions of load.
- B. Bending moment at given section for any positions of a point load.
- A. Only A
- B. Only B
- C. Both A and B
- D. Neither A nor B

Correct Answer: B

Sol:

the influence line for Bending Moment indicate Bending moment at given section for any positions of a point load.

88. The minimum percentage of shear reinforcement in R.C.C beam is \_\_\_\_\_.

- A.  $0.85/f_y$
- B. 0.4
- C. 4
- D.  $40S_v/f_y d$

Correct Answer: D

Sol:

The minimum percentage of shear reinforcement in R.C.C beam is  $40S_v/f_y d$

$0.85/f_y$  for minimum tension reinforcement

4 = for maximum longitudinal reinforcement either in tension or compression.

89. The maximum allowable percentage of tension reinforcement in R.C.C. beams is \_\_\_\_\_.

- A.  $0.85/f_y$
- B. 0.4
- C. 4
- D.  $40S_v/f_y d$

Correct Answer: C

Sol:

As per IS 456:2000

The maximum allowable percentage of tension reinforcement in R.C.C. beams is 4

This is also for compression reinforcement.

90. The maximum diameter of the reinforcement bars in R.C.C. slabs is \_\_\_\_\_.

- A. 20 mm
- B. 16 mm
- C. Span/100
- D. Thickness of slab/8

Correct Answer: D

Sol:

The maximum diameter of the reinforcement bars in R.C.C. slabs is Thickness of slab/8

91. The influence lines for any stress function are used for obtaining the maximum value due to \_\_\_\_\_.

- A. a single point load only

- B. uniform live load only
- C. several point loads
- D. All options are correct

Correct Answer: D

Sol:

The influence lines for any stress function are used for obtaining the maximum value due to A single point load ,uniform live load ,several point loads.

92. Bolts are most suitable to carry \_\_\_\_\_.

- A. shear
- B. bending
- C. axial tension
- D. shear and bending

Correct Answer: C

Sol:

Bolts are most suitable to carry axial tension, bolts are comparatively weak in shear and bending.

93. The ratio of the stresses produced by suddenly applied and gradually applied loads on a bar is \_\_\_\_\_.

- A. 0.25
- B. 0.5
- C. 1
- D. 2

Correct Answer: D

Sol:

Suddenly applied load =  $2p$

Gradually applied load =  $p$

Ratio of their stresses = 2

94. Maximum allowable shear stress in a section is  $100 \text{ kg/cm}^2$ . If bar is subjected to tensile force of  $5000 \text{ kg}$  and if the section is square shaped, what will be the dimension of sides of the squares?

- A. 10 cm
- B. 5 cm
- C. 12 cm
- D.  $\sqrt{12} \text{ cm}$

Correct Answer: B

Sol:

Given :

$$\tau_{\max} = 100 \text{ kg/cm}^2$$

$$\text{Tensile force} = 5000 \text{ kg}$$

$$\text{Max tensile stress will be} = \text{force/area} = 5000/a^2$$

$$a = \text{side of square}$$

$$\text{Minimum tensile stress} = 0$$

So

$$\tau_{\max} = (\text{max. tensile stress} - \text{min. tensile stress})/2$$

$$100 = ((5000/a^2) - 0)/2$$

$$a^2 = 25$$

$$a = 5 \text{ cm} = \text{side of square}$$

95. Most efficient and economical section used as a beam is \_\_\_\_\_.

- A. I-section
- B. Circular section
- C. Angles
- D. H-section

Correct Answer: A

Sol:

Most efficient and economical section used as a beam is I-section, due to shape factor 1.12 to 1.55  
96. A T-beam behaves as a rectangular beam of width equal to its flange if its neutral axis \_\_\_\_\_.

- A. coincides with centroid of reinforcement
- B. coincides with centroid of T-section
- C. remains within the flange
- D. remains in the web

Correct Answer: C

Sol:

A T-beam behaves as a rectangular beam of width equal to its flange if its neutral axis remains within the flange (depth of neutral axis < depth of flange)

97. A column has effective length L when its both ends are fixed. What will be the new effective length if one end becomes hinged?

- A. L
- B. 0.5L
- C. 1.41L
- D. 2L

Correct Answer: C

Sol:

When both end fixed  $l_e=l/2$  but given L, so  $l/2=L$   
And when one end is hinged the  $l_e=l/\sqrt{2}$  or  $= l\sqrt{2}/2$   
Then  $l=L\sqrt{2} = 1.41L$

98. For a standard 45° fillet, the ratio of size of filled to throat thickness is \_\_\_\_\_.

- A. 1:1
- B. 1: $\sqrt{2}$
- C.  $\sqrt{2}$ :1
- D. 2:1

Correct Answer: C

Sol:

For a standard 45° fillet, the ratio of size of filled to throat thickness is  $\sqrt{2}:1$

Size of fillet weld = k

Throat thickness =  $k\sin 45^\circ$

Ratio =  $k / k\sin 45^\circ = \sqrt{2}:1$

99. Centre to centre distance of adjacent rivet or bolt holes measured in the direction of stress is called \_\_\_\_\_.

- A. Gauge
- B. Pitch
- C. Lap
- D. Edge distance

Correct Answer: B

Sol:

Centre to centre distance of adjacent rivet or bolt holes measured in the direction of stress is called pitch

And perpendicular to direction of stress = gauge

100. A simply supported beam of span L and flexural rigidity EI, carries a unit point load at its centre. The strain energy in the beam due to bending is \_\_\_\_\_.

- A.  $L^3/48EI$
- B.  $L^3/192EI$
- C.  $L^3/96EI$
- D.  $L^3/16EI$

Correct Answer: C

Strain energy  $U = (P \times \Delta)/2$

Given:

P=unit point load

EI=flexural rigidity

$\Delta$ = deflection due to point load on simply supported beam,

So ,

$U = (1 \times L^3)/(48EI \times 2) = L^3/96EI$

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