1. Which of the following is the reason for the decrease in the use of stones as building material?
A. Steel and R.C.C. are less bulky and more durable
B. strength of stones cannot be rationally analysed
C. stones are not conveniently available in plains
D. All options are correct
Correct Answer: D
Solution:
The strength of stone cannot easily determined in comparison to steel and RCC, and also its not easily available in plans.

2. The solidification of molten magma when it reaches the surface of earth results in the formation of
A. sedimentary rocks
B. metamorphic rocks
C. basalts and traps
D. granite
Correct Answer: C
Solution:
Granite, basalt and traps are the igneous rock
Granite cools above earth surface
Basalt and traps cools below earth surface.

3. The argillaceous rocks have their principal constituents as
A. lime
B. clay
C. sand
D. None of these
Correct Answer: B
Soiution:
Argillaceous racks having the followings mineral forming constituents
Kaolinite,illite and montmorilonite
These are the caly forming mineral.

4. When a brick is cut into two halves longitudinally, one part is called:-
A. king closer
B. cornice brick
C. queen closer
D. voussoir
Correct Answer: C
Solution:
When cut from both the half part knows as king closer, and only in half part known as queen closer.

5. The red colour obtained by the bricks is due to the presence of:-
A. lime
B. silica
C. manganese
D. iron oxide
Correct Answer: D
Solution:
Iron oxide induces reddish brown colour in brick while manganese yellowish tint.

6. Which constituent of the cement, upon addition of water, sets and hardens first?
A. tri-calcium silicate
B. tri-calcium aluminate
C. di-calcium silicate
D. free lime
Correct Answer: B
Solution:
Tri calcium aluninate is the first formig complex compound on addition of water in cement within 24 hour, resposible for max heat of evoluion.

7. The aggregate is called fine aggregate if it is completely retained on
A. 0.15 mm sieve
B. 0.30 mm sieve
C. 4.75 mm sieve
D. None of these
Correct Answer: A
Solution:
Fine sand ranges from 4.75 mm to .075 mm
In which 0.075 to 0.15 fine sand
0.15 to 0.30 medium
0.30 to 4.75 course sand.

8. The solution of salts from the soil absorbed by the trees which becomes a viscous solution due to loss of moisture and action of carbon dioxide is knownas:-
A. pith
B. cambium
C. bark
D. sap
Correct Answer: D
Solution: Sap in between cambiun layer and heartwood, sap cotains moisture.

9. Shingle is
A. water bound pebbles
B. disintegrated laterite
C. crushed granite
D. None of these
Correct Answer: B
Solution:
Shingles are form due to disintegration of laterite soils.

10. Good quality sand is never obtained from which of the following source?
A. riverbed
B. nala
C. sea
D. gravel powder
Correct Answer: C
Solution:
Good qulity of sand found from the bed of river.

11. Pick up the excavation where measurements are made in square metres for payment.
A) Ordinary cuttings up to 1 m
B) Surface dressing up to 15 cm depths
C) Surface excavation up to 30 cm depths
A. A only
B. B only
C. C only
D. Both B and C

Correct Answer: D

Ordinary cutting up to 1m and surface dressing is not consider the measurement of volume works.

12. The expected out turn of 2.5 cm cement concrete floor per mason per day
A. 2.5 square metre
B. 5.0 square metre
C. 7.5 square metre
D. 10 square metre

Correct Answer: C

Solution:

As per given building code manuals out-turn for 2.5 cm…. 7.5 square metre

13. Portion of an embankment having a uniform up-gradient 1 in 500 is circular with radius 1000 m of the centre line. It subtends 180° at the centre. If theheight of the bank is 1 m at the lower end, and side slopes 2:1, the earth work involved
A. 26, 000 m^3
B. 26, 500 m^3
C. 27, 000 m^3
D. 27, 500 m^3

Correct Answer: D

Solution:

slope top radius is 500m, and we have bottom radius is 1000m.

Volume of truncated cone is 3.14*h*((R*R) + (r*r) + (R*r))*(1/3).

= 3.14*1**((1000*1000) + (500*500) + (1000*500))*(1/3).

= 27500 m^3.

14. As per Indian Standard Specifications, the peak discharge for domestic purposes per capita per minute, is taken
A. 1.80 litres for 5 to 10 users
B. 1.20 litres for 15 users
C. 1.35 litres for 20 users
D. All options are correct

Correct Answer: D

Solution :

As per given the govt. of india manual.

15. Pick up the item of work not included in the plinth area estimate
A. Wall thickness
B. Room area
C. Verandah area
D. Courtyard area

Correct Answer: D

Solution:

Plinth area estimate includes wall thickness, room area, verandah area, but not courtyard area.

16. Pick up the correct statement from the following:
A. The bent up bars at a support resist the negative bending moment
B. The bent up bars at a support resist the shearing force
C. The bending of bars near supports is generally at 45 degree

D. All options are correct

Correct Answer: D

Solution: All the points from IS 456:2000 provision of bent up bars.

17. The brick work is measured in square metre, in case of
A. Honey comb brick work
B. Brick flat soling
C. Half brick walls or the partition
D. All options are correct

Correct Answer: D

Solution:

Length, depths are considerable much more than width. Hence measured only in square meter.

18. Brick walls are measured in square metre if the thickness of the wall is
A. 10 cm
B. 15 cm
C. 20 cm
D. None of these

Correct Answer: A

Solution:

10 cm wall is the half brick wall.hence measured in square meter.

19. Pick up the correct statement in case of water supply.
A) Pipes laid in trenches and pipes fixed to walls are measured separately
B) Cutting through walls and floors are included with the item
C) Pipes are classified according to their sizes and quality
D) In laying pipes, the method of jointing and fixing is specifically specified
A. A only
B. B only
C. C only
D. A, B, C and D

Correct Answer: D

Solution:

During water supply all the above things mainly depends upon numbers of joint placed into the pipe during lying, fitting operations.

Classification of pipe depends upon their size and quality.

20. In case of laying gullies, siphons, intercepting traps, the cost includes
A. Setting and laying
B. Bed concreting
C. Connection to drains
D. All options are correct

Correct Answer: D

Solution:

Gullies, siphons, and traps in volved all the above operational cost.

21. For which of the following, will the chain surveying be well adopted one?
A. Large areas with difficult details

B. Small surveys in open ground
C. Small surveys with crowded details
D. Large areas with simple details
Correct Answer: B
Solution:
Chain surveying requires flat terrain and small in area.
22. Which of the following leveling is carried out to determine the elevation difference between two points on the surface of earth?
A. Reciprocal leveling
B. Simple leveling
C. Longitudinal leveling
D. Differential leveling
Correct Answer: D
Solution:
Differential leveling adopted for two points on earth surface.
Reciprocal leveling adopted when there are certain obstraction such as water bodies, lake,pond,river etc
23. Which of the following would represent the surface of the water level of a still lake?
A. Level surface
B. Contour surface
C. Horizontal surface
D. None of these
Correct Answer: A
Solution:
Still lake is the level surface.
Contour is the geographical gradients.
Horizontal surface is mean spheroidal surface of earth.
24. A contour canal is _____.
A. irrigates only on one side
B. does not needs bank on higher side
C. is generally aligned parallel to the contour of the area
D. All options are correct
Correct Answer: D
Solution :
Contour canal is aligned alond the geographical gradients that's why all option are true.
25. Which of the following are the required corrections for runway length?
A. correction for elevation
B. correction for gradient
C. correction for temperature
D. All options are correct
Correct Answer: D
solution:
elevation, gradients and temperature are the run way correction factors, that's why all are correct.
26. The representation of general topography of a very flat terrain is possible only by
A. drawing contours at large interval
B. drawing contours at small interval
C. giving spot levels at large interval

D. giving spot levels to salient features at close interval
Correct Answer: D
Solution:large intervals shows flat terrain and small interval shows steep terrain.
27. The telescope of a Dumpy level _____.
A. is rigidly fixed to the levelling head
B. can be titled in a vertical plane
C. can be taken out of its supports and reversed
D. permits interchange of eye piece and object glass
Correct Answer: A
Solution:
It can not reversed, can not tilt in vertical direction, impossible to interchange eye piece and objective glass.
28. Left swing is not much favoured in theodolite survey, because
A. most of surveyors are accustomed to right hand
B. it is inconvenient to turn the telescope anti-clockwise
C. the readings increase clockwise
D. vertical scale comes to an inconvenient position to be read
Correct Answer: C
Solution:
Left swing increases the reading which creats much more calculation and chances of error arrived. Hence not much favoured.
29. Point of tangency is the _____.
A. beginning of the curve
B. end of the curve
C. common point where the radius changes
D. common point where the radius and direction changes
Correct Answer: B
Solution:
 Tangency is the end point of curve where close traverse is formed.
30. If the bearing of AB = N40W, bearing of BC = S70° E, then the value of ∠ABC is
A. 30 degree
B. 70 degree
C. 100 degree
D. None of these
Correct Answer: D
Solution:
∠ABC = 110 . none of these.
31. The Rankine's theory for active earth pressure is based on the assumption that
A. The retained material is homogeneous and cohesion-less
B. The frictional resistance between the retaining wall and the retained material is neglected
C. The failure of the retained material takes place along a plane called rapture plane
D. All options are correct

Correct Answer: D
Solution :
In rankine assumption contact surface is assumed smooth that's why frctional resistance is neglected.
32. The assumption made in the theory of reinforced cement concrete beam is that
A. All the tensile stresses are taken up by the steel reinforcement only
B. The steel and concrete are stressed within its elastic limit
C. There is sufficient bond between steel and concrete
D. All options are correct
Correct Answer: D
Solution:
All these assumptions are from IS:456-2000. So all the options are correct.
33. Vane shear test is used to find out shear strength of:-
A. Sandy soil
B. Gravelly soil
C. Clayey soil
D. All options are correct
Correct Answer: C
Solution:
Vane shear test best suited to fine grained soil such as soft clay, silty clay.
34. Soil transported by wind is called
A. Aeolian soil
B. Alluvial soil
C. Marine soil
D. Locustrine soil
Correct Answer: A
Solution:
Aeolian soil = transported by wind
Alluvial soil = transported by water
Marine soil = found around the costal areas
Locustraine = deposited into the bed of lake.
35. The maximum number of jets generally employed in an impulse turbine without jet interference is
A. 2
B. 6
C. 4
D. 8
Correct Answer: B
Solution - Without jet interference maximum number of jets provided six.
36. In a Kaplan turbine runner, the number of blades is generally
A. 2 to 4
B. 8 to 16
C. 4 to 8
D. 16 to 24
Correct Answer: C
Solution:
For Kaplan turbine number of blades ranges from 4 to 8.

37. A Pelton wheel working under a constant head and discharge, has maximum efficiency when the speed ratio is:-
A. 0.26
B. 0.46
C. 0.36
D. 0.56
Correct Answer: B
Solution:
Pelton wheel when having the speed ratio is 0.46 it has maximum efficiency under const. head and discharge.
38. Which of the following statements is incorrect?
A. The reaction turbines are used for low head and high discharge
B. The angle of taper on draft tube is less than 8
C. A Francis turbine is an impulse turbine
D. None of these
Correct Answer: C
Solution:
Francis turbine is a Kaplan turbine follow the reverse archeamidies principal.
39. The specific speed of a turbine is speed of an imaginary turbine, identical with the given turbine, which
A. delivers unit discharge under unit head
B. delivers unit discharge under unit speed
C. develops unit horse power under unit head
D. develops unit horse power under unit speed
Correct Answer: C
Solution
Specific speed is defined as power generated by a turbine unit horse power under unit head.
40. In a centrifugal pump casing, the flow of water leaving the impeller is
A. Radial
B. Centrifugal
C. Rectilinear
D. Free vortex
Correct Answer: D
Solution :
Water leaving the impeller is the vortex type flow and it is free vortex in nature.
41. Newton's law of viscosity is a relationship between
A. Pressure, velocity and temperature
B. Shear stress and rate of shear strain
C. Shear stress and velocity
D. Rate of shear strain and temperature
Correct Answer: B
Solution:
Shear stress is directly proportional to rate of shear strain(velocity gradients)within the proportionality limit.
42. A fluid whose viscosity does not change with the rate of deformation or shear strain is known as:
A. Real fluid
B. Newtonian fluid

C. Ideal fluid
D. Non-Newtonian fluid
Correct Answer: B
Solution:
Viscosity is constant means the graph show that straight line passing through origin.

43. When the mach number is more than 6, the flow is called
A. Subsonicflow
B. supersonic flow
C. sonic flow
D. hypersonic flow
Correct Answer: D
Solution:
Mach no. =innetia force/elasticity force when its ration more than 6 it nature become hypersonic flow.

44. Viscous force is the _____ of shear stress due to viscosity and cross sectional area of flow.
A. Sum
B. Product
C. Difference
D. Ratio
Correct Answer: B
Solution:
Viscous force = shear stress *cross sectional area of flow.

45. Why do we need to do the linning of the canal?
A) To minimize seepage losses in canal
B) To prevent erosion of bed and sides due to high velocities
C) To decrease the discharge in the canal section by increasing the velocity
A. Only A
B. Only A and B
C. Only C
D. All A, B and C
Correct Answer: B
Solution:
Lining minimizes seepage loss,prevents erosion of bed and side of canal but increase water evaporation.

46. A sprinkler irrigation system is suitable when
A. the land gradient is steep and the soil is easily erodible
B. the soil is having low permeability
C. the water table is low
D. the crops to be grown have deep roots
Correct Answer: A
Solution:
On steep gradients frequent flow irrigation can not be provided, here sprinkler irrigation best suited.

47. The absolute minimum radius of curve for safe operation, for a speed of 110 kmph is:
A. 110 m
B. 440 m
C. 220 m
D. 577 m

Correct Answer: B
Solution: the compensate gradients is 4 degree for, so the radius will be=110*4=440m.

48. What is the psychological widening of a pavement on horizontal curve of radius 230 m for ruling speed 80 kmph?
A. 0.455m
B. 0.555m
C. 0.186 m
D. 0.136 m
Correct Answer: B
Solution:
Psychological widening=V/(9.5*under root R)=0.555m

49. Before entering a manhole a candle is lowered into the manhole
A. To illuminate it
B. To detect toxic gases
C. To give a signal to the adjacent manhole
D. To find out the presence of oxygen
Correct Answer: D
Solution:
Candle is lit and inserted into manhole to detect the presence of oxygen.

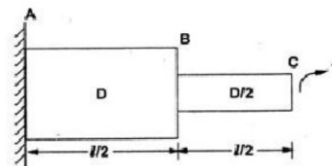50. A fundamental difference between sedimentation tank for water and sewage is
A. Sewage sedimentation tanks are bigger
B. Sewage sedimentation tanks have more depth
C. Sludge from sewage sedimentation is to be removed more frequently
D. It can be the final treatment of operation in water treatment
Correct Answer: C
Solution:
Sludge from sewage sedimentation is to be removed more frequently

51. A Circular shaft fixed at A has diameter D for half of its length and diameter D/2 over the other half. What is the rotation of C relative to B if the rotation of B relative to A is 0.1 radians?

A. 0.4 radians
B. 0.8 radians
C. 1.6 radians
D. 3.2 radians
Correct Answer: C
Solution:
from torque equation
$$\frac{T}{J}=\frac{\tau}{r}=\frac{G\theta}{l}$$
$$\theta=\frac{T\cdot l}{G\cdot J}, J=\frac{\pi D^4}{32}$$

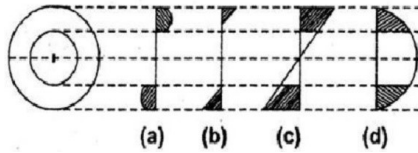$\theta_1 = 0.1 \, Radian(given)$

$$\theta_1 = \frac{T \times \frac{l}{2}}{G \cdot \frac{2\tau D^4}{32}}$$

$$\theta_2 = \frac{T \times \frac{l}{2}}{G \times \frac{\pi\left(\frac{D}{2}\right)^4}{32}}$$

$$\frac{\theta_1}{\theta_2} = \frac{\frac{D^4}{16}}{D^4} \Rightarrow \theta_2 = 16 \times \theta_1 = 1.6 \, Radian$$

52. a hollow shaft is subjected to torsion. which of the following diagrams shows the shear stress variation in the shaft along its radius?

    (a)   (b)   (c)   (d)

A. (a)
B. (b)
C. (c)
D. (d)

Correct Answer: (c)

Solution:
In shaft shear stress increases toward periphery and zero at neutral surface.

53. Moment of inertia of a circular section about its diameter 'd' is _____.

A. $\pi d^3/16$

B. $\pi d^4/32$

C. $\pi d^3/32$

D. $\pi d^4/64$

Correct Answer: D

Solution: Moment of inertia about its dia. Will be $\pi d^4/64$

54. A lever is supported on two hinges at A and C. It carries a force of 3 KN as shown in the figure below. The bending moment B will be:-
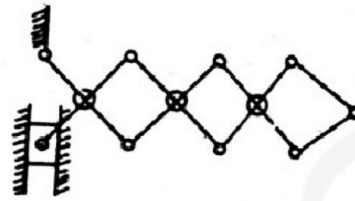

A. 3 KN-m
B. 2 KN-m
C. 1 KN-m
D. None of these

Correct Answer: D
Solution
At point B in the given figure there is a hinge support, at hinge there is no bending moment take place.

55. The kinematic chain shown in the figure below is a:-

A. structure
B. mechanism with one degree of freedom
C. mechanism with two degrees of freedom
D. mechanism with more than two degrees of freedom
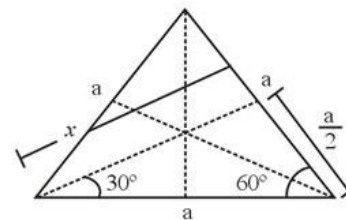
Correct Answer: B

Solution:
It is a mechanism and degree of freedom is one due to only one angular displacement at hinge at rigid support.

56. The centre of gravity of an equilateral triangle, with each side 'a' _____ from any of the three sides.

A. $\dfrac{\sqrt{3}a}{2}$

B. $\dfrac{a}{2\sqrt{3}}$

C. $2\sqrt{3}a$

D. $3\sqrt{3}a$

Correct Answer: B

Solution:

$\tan 30^\circ = \dfrac{x}{\frac{a}{2}}$

$\dfrac{1}{\sqrt{3}} = \dfrac{2x}{a}$

$x = \dfrac{a}{2\sqrt{3}}$

57. The angle of inclination of the plane at which the body begins to move down the plane, is called
A. Angle of friction
B. Angle of projection
C. Angle of repose

D. None of these
Correct Answer: C
Solution:
At angle when body just start to begin move in knows as angle of repose at this time limiting friction is less.

58. A body is said to move with Simple Harmonic Motion, if its acceleration is _____.
A. Always directed away from the centre, at the point of reference
B. Proportional to square of the distance from the point of reference
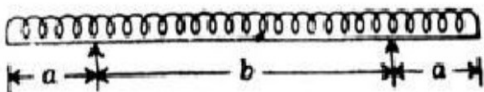C. Proportional to the distance from the point of reference and directed towards it
D. None of these
Correct Answer: C
Solution:
The body is in simple harmonic motion, and it will always remain its position proportional to its mean reference point.

59. A horizontal beam carrying uniformly distributed load is supported with equal overhangs is shown in the figure below. The resultant bending moment at the mid-span shell will be zero if (a/b) is :-
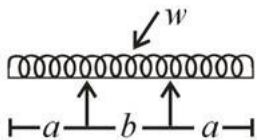

A. 0.75
B. 0.66
C. 0.5
D. 0.33
Correct Answer: C
Solution:

Resultant B.M. at mid

$$-\left(\frac{wb^2}{8} - \frac{wa^2}{2}\right)$$

Span

$$So, \frac{wb^2}{8} - \frac{wa^2}{2} = 0$$

$$\frac{a^2}{b^2} = \frac{1}{4} \Rightarrow \frac{9}{b} = 0.5$$

60. Two persons of equal weights are hanging by their hands from the ends of a rope hung over frictionless pulley. They begin to climb. One person can climb twice the speed of other, who gets to the top first?
A. Slower climber
B. Both get there together
C. Faster climber
D. Cannot climb at all

Correct Answer: B
Solution:
Pulley is frictionless and also there weights are same. so force will be same irrespective of there climbing speed. hence they reach at same time

61. The phenomenon of slow extension of materials, i.e. increasing with time having no constant load, is called_____.
A. Creeping
B. Breaking
C. Yielding
D. None of these
Correct Answer: C
Solution:
Creep is the result of continuous load while breaking is the result of impact load, but when yielding start no load required.

62. The stress at which extension of a material takes place more quickly as compared to the increase in load, is called as
A. Elastic point
B. Plastic point
C. Breaking point
D. Yielding point
Correct Answer: D
Solution:
 when yielding start no load required.

63. For quality control of Portland cement, the test essentially done is
A. setting time
B. soundness
C. tensile strength
D. All options are correct
Correct Answer: D
Solution:
All the test required to check the quality control of Portland cement.

64. If 1500 g of water is required to have 1875 g cement paste of normal consistency, the percentage of water is _____.
A. 20%
B. 25%
C. 30%
D. 35%
Correct Answer: B
Solution:
For normal consistency 0.78P value requird so for 1875 g cement and 1500 g water need

65. Under normal conditions using ordinary cement, the period of removal of the form work, is
A. 7 days for beam soffits
B. 14 days for bottom slabs of spans 4.6 m and more
C. 21 days for bottom beams over 6 m spans
D. All options are correct
Correct Answer: D
Solution
As per IS 456:2000 removal of form work for

Beam soffits = 7days
Slab=14 days up to span 4.6 m
Bottom beam =21 days up to 6m span
Bottom beam also knows as tie beam it is just above the ground support provide lateral support to foundation.

66. For given water content, workability decreases if the concrete aggregates contain an excess of
A. thin particles
B. flat particles
C. elongated particles
D. All options are correct
Correct Answer: D
Solution :
Thin flat elongated particle decreases the workability while rounded partical increases the workability of concrete.

67. For ensuring quality of concrete, use
A. single sized aggregates
B. two sized aggregate
C. graded aggregates
D. coarse aggregates
Correct Answer: C
Solution :
For quality ensuring well graded aggregates requird.

68. According to I.S.: 456, the number of grades of concrete mixes, is _____.
A. 3
B. 4
C. 5
D. 7
Correct Answer: D
Solution:
As per IS 456:2000 the grade of concrete is M20 to M50.

69. The mixture of different ingredients of cement, is burnt at:
A. 1000°C
B. 1200°C
C. 1400°C
D. 1600°C
Correct Answer: C
Solution:
Temperature range is 1300 to 1500 degree

70. The risk of segregation is more for:
A. wetter mix
B. larger proportion of maximum size aggregate
C. coarser grading
D. All options are correct
Correct Answer: D
Solution:
Risk arises with all the case in segregation in concrete.

71. After casting, an ordinary cement concrete on drying:
A. expands
B. mix

C. shrinks
D. None of these.
Correct Answer: C
Solution:
Due to formation of tricalcium aluminate concrete start shrink on dying, if water content is more, more shrinkage occurs.

72. Hydration of cement is due to chemical action of water with:
A. Tricalcium silicate and dicalcium silicate
B. Dicalcium silicate and tricalcium aluminate
C. Tricalcium aluminate and tricalcium alumino ferrite
D. All options are correct
Correct Answer: D
Solution:
All the complex compound form on addition of water and responsible for the heat of evolution.

73. To obtain cement dry powder, lime stones and shales or their slurry, is burnt in a rotary kiln at a temperature between
A. 1100° and 1200°C
B. 1200° and 1300°C
C. 1300° and 1400°C
D. 1400° and 1500°C
Correct Answer: D
Solution:
Cement ingridients mix at the temperature of 1300 to 1500 degree.

74. Permissible compressive strength of M 30 concrete grade (in kg/cm2) is
A. 100
B. 150
C. 200
D. 300
Correct Answer: D
Solution:
M30, 30 stand for compressive strength in N/mm^2.

75. Curing_____.
A. reduces the shrinkage of concrete
B. preserves the properties of concrete
C. prevents the loss of water by evaporation
D. All options are correct
Correct Answer: D
Solution :
All the things are related to currying of cement.

76. The maximum amount of dust which may be permitted in aggregates is
A. 5% of the total aggregates for low workability with a coarse grading
B. 10% of the total aggregates for low workability with a fine grading
C. 20% of the total aggregates for a mix having high workability with fine grading
D. All options are correct
Correct Answer: D
Solution:

5%, 10%, 20% are required for low, medium and high workability cement.

77. Proper proportioning of concrete, ensures_____.
A. desired strength and workability
B. desired durability
C. water tightness of the structure
D. All options are correct
Correct Answer: D
Solution:
Proper proportioning of concrete for strength , durability, workability and water tightness of the structure.

78. The bulk density of aggregates does not depend upon _____>
A. size and shape of aggregates
B. specific gravity of aggregates
C. grading of aggregates
D. size and shape of the container
Correct Answer: D
Solution:
Bulk density not related to size of container.

79. While compacting the concrete by a mechanical vibrator, the slump should not exceed._____ cm.
A. 2.5
B. 5.0
C. 7.5
D. 10
Correct Answer: B
Solution:
For mechanical vibrator slump limited to 5.0 if it more than then chances of segregation or bleeding takes place.

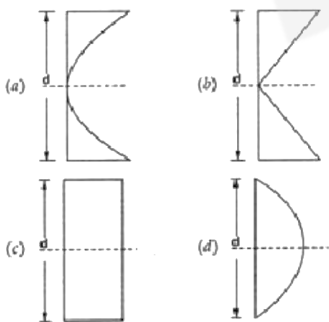80. An aggregate is said to be flaky if its least dimension is less than _____>
A. 1/5th of mean dimension
B. 2/5th of mean dimension
C. 3/5th of mean dimension
D. 4/5th of mean dimension
Correct Answer: C
Solution:
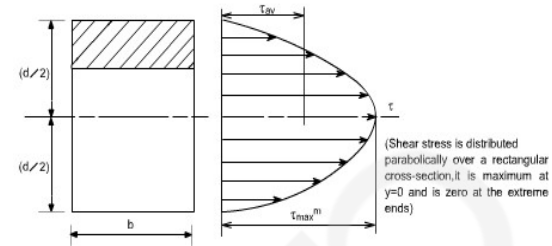For flakyness the dia is 3/5thof mean dia f aggregates

81. Shear stress distribution of a beam of rectangular cross-section, subjected to transverse loading will be :

A. (a)
B. (b)
C. (c)
D. (d)
Correct Answer: (d)
Sol:

In this case shear stress is maximum at neutral axis

82. If the stress in each cross-section of a pillar is just equal to its working stress, its form is called
A. Form of equal stress
B. Form of equal strength
C. Form of equal section
D. None of these
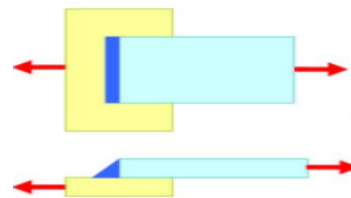Correct Answer: B
Sol: due to uniform cross section of pillar.
Stress in each cross section equals its working stress. So its form of equal strength

83. The transverse fillet welds are designed for
A. Tensile strength
B. Shear strength
C. Compressive strength
D. Bending strength
Correct Answer: A
Sol:

There is transverse fillet welds as shown in figure. Which is design for tensile strength

84. When a thin cylindrical shell is subjected to an internal pressure, there will be _____.
A. A decrease in diameter and length of the shell
B. An increase in diameter and decrease in length of the shell
C. a decrease in diameter and increase in length of the shell
D. None of these
Correct Answer: D
Sol: in case of thin cylinder
 The diameter & length of cylinder shell does not depend on internal pressure of cylinder

85. The compression members always tend to buckle in the direction of
A. Axis load

B. Perpendicular to the axis of load
C. Minimum cross-section
D. Least radius of gyration
Correct Answer: D
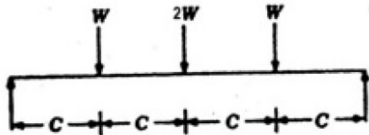Sol: When the body tends to buckling column only can fail by buckling (with a certain condition).
l/r > 97 (must for long column).
So least r required. The radius of gyration created.

86. A simply supported beam is loaded as shown in the figure below.
The maximum shear force in the beam will be _____.

A. 0
B. w
C. 2w
D. 4w
Correct Answer: C
Sol: Ra + Rb = W+2w+w
Ra+ Rb = 4W
& , moment at end support is equal to zero
So , Ra × 4C = (W×3C)+(2W×2C)+(W×C)
Ra = 2W , Rb = 2W
SF is maximum at support so, maximum shear force = 2w

87. A column with maximum equivalent length has
A. Both ends hinged
B. Both ends fixed
C. One end is fixed and the other end is hinged
D. One end fixed and the other end free
Correct Answer: C
Sol: maximum equivalent length of coloum = 2×actual length of coloum in case of one end is fixed and another is free

88. In case of eccentrically loaded struts _____ is preferred.
A. Solid section
B. Hollow section
C. Composite section
D. Reinforced section
Correct Answer: C
Sol:In case of composite section each section of composite section carries equal load

89. The design of a structure is
A. the planning of the structure
B. the calculation of straining actions at salient points
C. deciding the material and proportions of the various members of the structure
D. None of these
Correct Answer: C
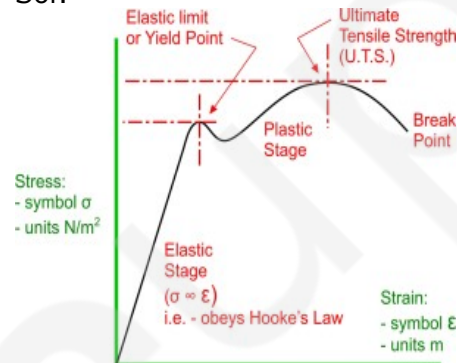Sol: A structural system is the combination of structural elements and their materials. It is important to classify a structure by either its form or its function, by recognizing the various elements composing that structure.

90. In a tensile test, when the material is stressed beyond elastic limit, the tensile strain _____as compared to the stress.
A. decreases slowly
B. increases slowly
C. decreases more quickly
D. increases more quickly
Correct Answer: D
Sol:

91. Factor of safety is defined as the ratio of
A. ultimate stress to working stress
B. working stress to ultimate stress
C. breaking stress to ultimate stress
D. ultimate stress to breaking stress
Correct Answer: D
sol: the factor of safety is how much stronger the system is than it usually needs to be for an intended load
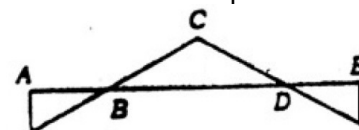
92. In compression test, the fracture in cast iron specimen would
A. occur along the axis of load
B. occur along an oblique plane
C. occur at right angles to the axis of specimen
D. not occur
Correct Answer: B
Sol: Cast iron is very strong in compression, but weak in shear. When a cast iron specimen is subjected to compression test, the perpendicular cross section bears the direct compressive stress. But a plane inclined at 45 deg to the normal plane has shear stresses due to resolved compression force. Thus this plane is subjected to shear stress. As said earlier, cast iron is weak in shear. So failure occurrs along this inclined plane.

93. Bending moment distribution in a built beam is shown in the figure below. The shear force distribution in the beam is represented by :

(A)

(B)

(C)

(D)

ANS. a
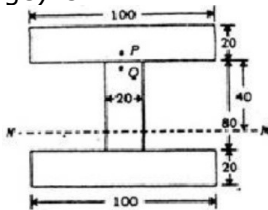Sol: dm/dx = F
So, F×(dx) = dm (a)
From the above equation (a)
If bending moment is minimum then shear force will be maximum

94. The figure (all dimensions are in mm) below shows an I-section of the beam. The shear stress at point P (very close to the bottom of the flange) is 12 MPa. The stress at point Q in the web (very close to the flange) is :

A. Indeterminable due to incomplete data
B. 60 MPa
C. 18 MPa
D. 12 MPa
Correct Answer: B
Sol: by the equation
$\sigma_1.a_1 = \sigma_2.a_2$
$12 \times 100 \times 20 = \sigma_2 \times 20 \times 20$
$\sigma_2 = 60$

95. The maximum frictional force, which comes into play, when a body just begins to slide over the surface of the other body, is known as
A. Static friction
B. Limiting friction
C. Dynamic friction
D. Coefficient of friction
Correct Answer: B
Sol: The maximum friction that can be generated between two static surfaces in contact with each other. Once a force applied to the two surfaces exceeds the limiting friction, motion will occur. For two dry surfaces, the limiting friction is a product of the normal reaction force and the coefficient of limiting friction.

96. A column of length 'L' with both ends fixed may be considered as equivalent to a column of length _____ with both ends hinged.
A. L/8
B. L/2
C. L/4
D. L

Correct Answer: B
Sol: for both end fixed ,
Equivalent length of coloum = ½(actual length of coloum)
& for both end hinged
Equalent length of coloum is equal to the actual length of coloum

97. According to Euler's column theory, the crippling load for a column of length (l) fixed at both ends is _____ the crippling load for a similar column
A. equal to
B. 4 times
C. 2 times
D. 8 times
Correct Answer: B
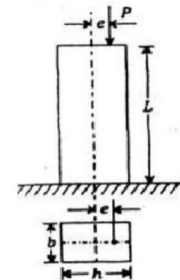 Sol: crippling load ,
$P = (\pi^2 EI)/ L^2$
SO $P \propto (1/ L^2)$
$P_1/P_2 = (L_2^2/L_1^2)$
For similar coloum $L_2 = L/2$
& $L_1 = L$
So $P_2 = 4P_1$ (FROM ABOVE EQUATION)

98. A short column of symmetric cross section made of a brittle material is subjected to an eccentric vertical load 'P' at an eccentricity 'e'. To avoid tensile stress in the short column, the eccentricity 'e' should be less than or equal to:

A. h/12
B. h/6
C. h/3
D. h/2
Correct Answer: B
Solution
To avoid tensile stress,
$\sigma_{min} \geq 0$

$$\frac{F_v}{h \times 1}\left[1 - \frac{6e}{h}\right] \geq 0$$

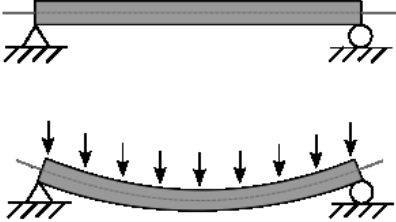$$\left[1 - \frac{6e}{h}\right] \geq 0$$

$$\frac{6e}{h} \leq 1$$

$$e \leq \frac{h}{6}$$

99. A beam is structural member predominantly subjected to

A. transverse loads
B. axial forces
C. twisting moment
D. None of these
Correct Answer: A
Sol: A beam is a structural element that primarily resists loads applied laterally to the beam's axis. Its mode of deflection is primarily by bending. The loads applied to the beam result in reaction forces at the beam's support points.

100. A truss is completely analysed, when
A. the direct stresses in all the members are found
B. all the external reactions components are determined
C. the equilibrium is satisfied
D. None of these
Correct Answer: A
Sol: we can analyze any truss by three methods to determine the force in each member
By method of joint.
By method of section.
& by method of graphical analysis

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