CIVIL ENGINEERING
WORDS IN BOLD ARE THE ANSWERS

1.If 'p' is the standard consistency of cement, the amount of water used in conducting the initial setting time test on cement is
a. 0.65p
b.0.85p
c. 0.6p
d.0.8p

2. For compete hydration of cement the water- cement ratio needed is
a. less than .25
b. more than 0.25 but less than 0.35
c. more than 0.35 but less than 0.45
d. more than 0.45 but less than 0.60

3. High alumina cement is produced by fusing together a mixture of
a. limestone and bauxite
b. limestone, bauxite and gypsum
c. limestone, gypsum and clay
d. limestone gypsum, bauxite, clay and chalk

4. Before testing setting time of cement, one should test for
a. soundness
b. strength
c. fineness
d. consistency

5.The fineness of cement is tested by:
a. air- content method
b. air- permeability method
c.le-chalelier apparatus
d. vicats apparatus

6. The proper size of mould for testing compressive strength of cement is
a. 7.05cm cube
b. 10.5cm cube
c. 15cm cube
d. 12.05cm cube

7. A quick- setting cement has an initial setting time of about
a. 50 minutes
b. 40 minutes

c. 15 minutes
d. 5 minutes

8. For marine works, the best suited cement is
a. low heat Portland cement
b. rapid hardening cement
c. ordinary Portland cement
d. blast furnace slag cement

9. Ultimate strength of cement is influence by which one of the following?
a. Tricalcium silicate
b.Dicalcium silicate
c.Tricalcum alumunate
d. Tetracalcium alumina- ferrite

10. In cement generally the increase in strength during a period of 14 days to 28 days is primarily due to
a.C_3A
b.C_2S
c.C_3S
d.C_4AF

11. Which compound of cement is responsible for strength of cement?
a. Magnesium oxide
b. silica
c. alumina
d. calcium sulphate

12. A cement bag contains 0.035 cubic meter of cement by volume. How many bags will one tone of cement compress?
a.16
b. 17
c. 18
d.20

13. The approximate proportion of dry cement mortar required for brickwork is
a. 60%
b. 45%
c. 30%
d. 10%

14. A mortar for which both cement and lime are mixed is called
a. gauged mortar
b. cement mortar
c. lime mortar
d. light weight mortar

15. The maximum bulking of sand is likely to occur at a moisture content of
a. 5%
b. 8%
c. 11%
d. 14%

16.What is the quantity of cement (in kg) and of dry sand (in cubic meter) respectively required for preparing 1 cube meter of wet cement mortar of 1:5 proportion?
a. 270 and 1:00
b. 290 and 0:05
c.290 and 1:00
d.310 and 1:05

17. Which of the following is the correct range of fineness modulus sand and usable in preparing cement mortar?
a. 1.5 to 2.2
b.2.6 to 2.9
c. 2.9 to 3.2
d. 5.5 to 6.5

18. Lime mortar is generally made with
a. quick lime
b. fat lime
c. hydraulic lime
d. white lime

19. Blast furnace stag has approximately
a.45% calcium oxide and about 35% silica
b.50% calcium and 20% calcium oxide
c. 25% magnesia and 15% silica
d. 25% calcium sulphate and 15% alumina

20. One of the main demerits in using the lime mortar is that it
a. is not durable
b. does not set quickly
c. swells
d. is plastic

21.Why is lime added to cement slurry for the topcoat of plastering?
a. to improve the strength of plaster
b. to stiffen the plaster
c. to smoothen the plaster for ease of speed
d. to make the plaster non- shrinkable

22. The approximate ratio of strength of 15cm × 30 cm concrete cylinder to that of 15cm cube of the same concrete is
a. 1.25
b. 1.00
c.0.85
d. 0.50

23. The approximate ratio between the strength of cement concrete at 7 days and at and at 28 days is
a. 3/4
b. 2/3
c. 1/2
d. 1/3

24. The optimum number of revolutions over which concrete required to be mixed in a mixture machine is
a. 10
b. 20
c. 50
d. 100

25. As per IS code of practice concrete should be cured at
a. 5°c
b. 10°c
c. 27°c
d. 40°c

26. The ratio of direct tensile strength to that of modulus of rupture of concrete is
a. 0.25

b. 0.5
c. 0.75
d. 1.0

27. Which one of the following aggregates gives maximum strength in concrete?
a. Rounded aggregate
b. Elongated aggregate
c. Flaky aggregate
d. Cubical aggregate

28. What is the range of fineness modulus of sand which is least suitable for making a good concrete?
a. 3.5 – 4.5
b. 2.9 – 3.2
c. 2.6 – 2.9
d. 2.2 – 2.6

29. On which one of the following factors, does strength of concrete depend primarily?
a. Quality of coarse aggregate
b. Quality of fine aggregate
c. Fineness of cement
d. Water – cement ratio

30. On which one of the following is the working principle of concrete hammer for non-destructive test based?
a. Rebound deflections
b. Radioactive waves
c. Ultrasonic pulse
d. creep-recovery

31. What is the approximate ratio of cement concrete at 7 days to that at 28 days curing?
a. 0.40
b. 0.65
c. 0.90
d. 1.15

32. In what context is the slump test performed?
a. Strength of concrete

b. Workability of concrete
c. Water-cement ratio
d. Durability of concrete

33. What is the ratio of flexural strength (fer) to the characteristic compressive strength of concrete (fer) for M25 grade concrete?
a. 0.08
b. 0.11
c. 0.14
d. 0.17

34. According to that Indian standard specifications, concrete should be cured under a humidity of
a. 90%
b. 80%
c. 70%
d. 60%

35. If aggregate size of 50-40mm is to be tested for determining the proportion of elongated aggregates, the slot of length of the gauge should be
a. 45mm
b. 53mm
c. 81mm
d. 90mm

36. A good brick should not absorb water by weight more than
a. 10%
b. 20%
c. 25%
d. 30%

37. The texture of sandstone is
a. Perphyritic
b. Conglomerate
c. Vesicular
d. Granular of crystalline

38. For one cubic meter of brick masonry, the number of modular bricks needed is

a. 400 or less
b. 400 to 450
c. 500 to 550
d. 600 to 650

39. Bricks are burnt at a temperature range of
a. 500° to 700°c
b. 700° to 900°c
c. 900° to 1200°c
d. 1200° to 1500°c

40. The slenderness ratio for masonry walls should not be more than
a. 50
b. 50
c. 30
d. 20

41. The temperature range in a cement kiln is
a. 500° to 1000°c
b. 1000° to 1200°c
c. 1300° to 1500°c
d. 1600° to 2000°c

42. An arrangement for temporarily supporting a structure from beneath for safety is known as
a. jacking
b. underpinning
c. supporting
d. hauling

43. The bricks which are extensively used for basic refractoriness in furnaces are
a. chrome bricks
b. sillimanite bricks
c. Magnesite bricks
d. Fosterite bricks

44. The maximum compressive strength of first class bricks should be
a. 5 N/mm²
b. 7.5 N/mm²

c. 9 N/mm²
d. 10 N/mm²

45. Which type of brick masonry bond is provided for heavy loads on masonry?
a. English bond
b. Zigzag bond

c. Single Flemish bond
d. Double Flemish bond

46. The strength of timber is maximum when load applied is
a. Parallel to grain
b. Perpendicular to grain
c. inclined to 45° to grain
d. inclined at 60° to grain

47. The modulus of elasticity of timber is about
a. 0.5 to 1.0 × 10⁴ N/mm²
b. 1.0 to 1.5 × 10⁴ N/mm²
c. 1.5 to 2.0 × 10⁴ N/mm²
d. 2.0 to 2.5 × 10⁴ N/mm²

48. Radial splits in timber originating from 'bark' and narrowing towards the 'pith' are known as
a. Heart shakes
b. Star shakes
c. Cup shakes
d. Knots

49. Woods is impregnated with creosote oil in order to
a. Change its color
b. Protect against fungi
c. Protect the annular layers
d. Fill up the pores

50. Timber can be made reasonably fire-resistant by
a. soaking it in ammonium sulphate
b. coating with tar paint
c. pumping creosote oil under high pressure
d. none of the above

CIVIL ENGINEERING
WORDS IN BOLD ARE THE ANSWERS

51. The timber preservative 'creosote' belongs to the group?
a. water soluble salts
b. organic solvent type
c. tar oil type
d. inorganic solvent type.

52. As a natural material, timber is which of the following?
a. Isotropic
b. Anisotropic
c. Homogenous
d. Heterogeneous

53. What is the modulus of elasticity of standard timber (Group B) in (MN Km²)?
a. 0.5 to 1.0
b. 1.0 to 1.25
c. 1.25 to 1.5
d. 1.5 to 1.75

54. The carbon content of structural steel is
a. less than 0.1%
b. 0.10% to 0.25%
c. 0.25 to 0.60%
d. 0.60 to 1.00%

55. In paint, linseed oil is used as
a. a thinner
b. a drier
c. a vehicle
d. water proofing base

56. The ratio of Young's modulus of high tensile steel to that of mild steel is about
a. 0.5
b. 1.0
c. 1.5
d. 2.0

57. Shear span is defined as the zone where
a. bending moment is zero
b. shear force is zero

c. shear force is constant
d. bending moment is constant

58. What is the angle between principle strain axis and maximum shear strain axis?
a. 0°
b. 30°

c. 45°
d. 90°

59. All the failure theories gives nearly the same result?
a. when one of the principal stresses at a point is larger in comparison to other
b. when shear stresses act
c. when both the principal stresses are numerically equal
d. for all situation of stress.

60. In the Mohr's circle for strains, radius of Mohr's circle gives the
a. minimum value of normal strain
b. maximum value of normal strain
c. maximum value of shear strain
d. half of maximum value of shear strain

61. If shear force diagram of a simply supported beam is parabolic then the load on the beam is
a. uniformly distributed load
b. concentrated load at mid span
c. external moment acting at mid span
d. linearly varying distributed load

62. A simply supported beam AB is subjected to a concentrated load at C, the centre of the span. The area of the 3F diagram from A to C will give
a. BM at C
b. load at S
c. difference between BM values at A and C
d. both (a) and (c)

63. For the design of a cost iron member, the most appropriate theory of failure is.
a. Mohr's theory
b. Rankine's theory
c. maximum stress theory
d. maximum shear energy theory

64. A simply supported beam AB of span α carries two concentrated loads W each at points $\alpha/3$ from A and B. what is the SF in the middle one –third portion of the beam?
a. w/2
b. 2N
c. w
d.zero

65. The principal stress at a point in a bar are 160 N/mm² (tensile) and 80 N/mm² (compressive). The accompanying maximum shear stress intensity is
a. 100 N/mm²
b. 110 N/mm²
c. 120 N/mm²
d.140 N/mm²

66. The radius of Mohr's circle is zero when the state of stress is such that
a. shear stress is zero
b. there is pure shear
c. there is no shear stress but identical direct stresses in two mutually perpendicular directions
d. there is no shear stress but equal direct stresses, opposite in nature, in two mutually perpendicular directions.

67. For shear force to be uniform throughout the span of a simply supported beam, which of the following loads should be applied on the beam?

a. two equally spaced concentric loads
b. a couple at mid span only
c. a couple anywhere in the span
d. UDL over the entire span

68. According to maximum shear stress failure criterion yielding in material occurs when
a. maximum shear stress = $\frac{1}{2}$ yield stress
b. maximum shear stress = $\sqrt{2} \times$ yield stress

c. maximum shear stress = $\sqrt{3}\times$ yield stress
d. maximum shear stress = $2\times$ yield stress

69. The maximum deflection of a fixed beam carrying a control load 'w' is equal to
a. $\frac{wl^3}{48EI}$

b. $\frac{wl^3}{90EI}$

c. $\frac{wl^3}{192EI}$

d. $\frac{wl^3}{EI} \frac{5}{384}$

70. The maximum deflection of simply supported beam occurs at zero
a. bending moment location
b. shear force location
c. slope location
d. shear force location and also zero bending moment location

71. A unique relation between bending moment (m) and intensity of load (x) acting continuously on a beam of span (l) al a distance (x) along the axis (the rigidity of beam is EI) is given by
a. $M = \frac{wL^2}{48EI}$

b. $W = \frac{d^2M}{dx^2}$

c. $M = EI \frac{d^2w}{dx^2}$

d. $M = \frac{wl^2}{12}$

72. The compatibility conditions in terms of strain in a two- dimensional problem are associated with
a. stresses
b. forces
c. properties of materials
d. deformations

73. If a cantilever beam of span L and flexural rigidity EI carries a moment M at the free end, the deflection at that end is
a. $\frac{ML}{24EI}$

b. $\frac{ML^2}{12EI}$

c. $\frac{ML}{6EI}$

d. $\frac{ML^2}{2EI}$

74. A hinged support in a real beam
a. becomes an internal hinge in a conjugate beam
b. changes to be free support in a conjugate beam
c. changes to be fixed support in a conjugate beam
d. remains as a hinged support in a conjugate beam

75. A rectangular timber beam is cut out of a cylindrical log of diameter D. the depth of the strongest timber beam will be
a. $\sqrt{\frac{1}{2}}D$

b. $\sqrt{\frac{2}{3}}D$

c. $\sqrt{\frac{5}{8}}D$

d. $\sqrt{\frac{3}{4}}D$

76. A ratio of moment carrying capacity of a circular beam of diameter D and square beam of size D is
a. $x/4$

b. $3x/8$

c. $x/3$

d. $3x/16$

77. A rectangular beam of width 200mm and depth 300mm is subjected to a shear force of 200 KN. The maximum shear stress produced in the beam is
a. 10.0 MPa
b. 7.5 MPa
c. 5.0 MPa
d. 3.33 MPa

78. What is the ratio of maximum shear stress to average shear stress for a circular section?
a. 2
b. 2/3
c. 4/3
d. 3/4

79. A cantilever beam of T cross- section carries uniformly distributed load. Where does the maximum magnitude of the bending stress occur?
a. at the top of cross- section
b. at the junction of flange and web
c. at the mid- depth point
d. at the bottom of the section.

80. A square beam laid flat is then rotated in such a way that one of its diagonal becomes horizontal. How is its moment capacity affected?
a. Increases by 41.4%
b. Increases by 29.27%
c. decreases by 29.27%
d. decreases by 41.4%

81. The variation of the hoop stress across the thickness of a thick cylinder is
a. Linear
b. Uniform
c. Parabolic
d. Hyperbolic

82. The ratio of tensile stress developed in the wall of a boiler in the longitudinal direction to the tensile stress in the circumferential direction due to an internal pressure is
a. 4
b. 2
c. 1/4
d. 1/2

83. Which of the following test compares the dynamic modulus of elasticity of samples of concrete?
a. Compression test
b. Ultrasonic pulse velocity test
c. Split test
d. Tension test

84.For the analysis of thick cylinder, the theory applicable is
a. Lame's theory
b. Rankine's theory
c. Poisson's theory
d. Courben's theory

85. If three close-coiled and two open-coiled helical springs, each having the stiffness 'x' are connected in series than the overall stiffness is
a.5K

b.K/5

c. K/√5

d. 6K/5

86. If two springs of stiffness k_1 and k_2 are connected in series, the stiffness of the combined spring is
a. $\dfrac{k_1\,k_2}{k_1+k_2}$

b. $\dfrac{k_1+k_2}{k_1 k_2}$

c. k_1+k_2

d. $k_1\,k_2$

87. If the diameter of the shaft subjected to torque alone is doubled, then the horse power P can be increased to
a. 16P
b. 8P
c. 4p
d. 2P

88. If a circular shaft is subjected to a torque T and a bending moment M, the ratio of the maximum shear stress to the maximum bending stress is given by
a. $\dfrac{2M}{T}$

b. $\dfrac{T}{2M}$

c. $\dfrac{2T}{M}$

d. $\dfrac{M}{27}$

89. For a circular column having its end hinged the slenderness ratio is 160. The L/d ratio of the column is
a. 80
b. 57
c. 40
d. 20

90. The polar modulus of a circular shaft of diameter d is
a. $\dfrac{\chi}{16}\,d^2$

b. $\frac{\chi}{32}$ d²

c. $\frac{\chi}{64}$. d²

d. $\frac{\chi}{36}$ d²

91. Which one of the following pairs is not correctly matched?
a. Lame's constants: Thick cylinder
b. Macaulay's method: Deflection of beam
c. Euler's method: Theory of column
d. Eddy's theorem: Torsion of shafts.

92. The number of fundamental motions involved in micro-motion study is
a. 12
b. 16
c. 17
d. 24

93. A correct solution of a statically indeterminate structure as per the energy method
a. is statically admissible
b. is kinetically constant
c. makes the strain energy of the structure a minimum
d. can be given by (a) (b) and (c) of the question

94. A statically indeterminate building of a frame may be converted to statically determinate one by assuming
a. hinges at mid-height of columns
b. hinges at mid-span of the beams
c. hinges at both mid-height of columns and mid-span of beams
d. none of the above

95. Which of the following is true example of statically determinate beam?
a. One end is fixed and other end is simply supported
b. Both ends are fixed

c. The beam overhangs over two supports
d. The beam is supported on three supports

96. The number of unknowns to be determine in the stiffness method is equal to
a. The static indeterminacy
b. The kinematic indeterminacy
c. The sum of (a) and (b)
d. Two times the number of support

97. A statically determinate structure
a.cannot be analyzed without correct knowledge of modulus of elasticity
b.must necessarily have roller support at one of its end

c. requires only statical equilibrium equations for its analysis
d. will have zero deflection at its ends.

98. A statically indeterminate structure is the one which
a. cannot be analyzed at all
b. can be analyzed using the equation of static only
c. can be analyzed using equation of statics and compatibility equations
d.can be analyzed using equation of compatibility only

99. If the axial deformation is neglected, what is the kinematic indeterminacy of a single bay portal frame fixed at base?
a. 2
b. 3
c. 4
d. 6

100. The number of independent equations to be satisfied for static equilibrium in space structure is
a. 3
b. 6
c. 4
d. 2

101. A suspension bridge with a two hinged stiffening girder is statically
a. determinate
b. indeterminate to 1 degree
c. indeterminate to 2 degree
d. indeterminate to 3 degrees

102.The maximum number of unknown forces that can be determined in a concurrent coplanar force system under equilibrium is
a. 2
b. 3
c. 6
d. 1

103.The are of influence diagram for reaction at hinged end of a uniform propped cantilever beam of span 'ι' is
a. $\frac{3l}{8}$

b. $\frac{l}{2}$

c. $\frac{l}{4}$

d. $\frac{l}{8}$

104. What are the uses of influence lines?
a. To study effects of moving loads on the structure
b. To calculate the value of stress
c. To find position of live load for a maximum value of particular stress function
d. Toward all the above purposes

105.Muller Brestau principle is applicable to get influence line for which of the following?
a. Reaction at the ends of a simple beam
b. Bending moment at a section
c. Shear force at a section
d. Forces and moment at any section

106. Due to some point load anywhere on a fixed bean, the maximum free bending moment is M. The sum of fixed end moment is
a. M
b. 1.5 M
c. 2.0 M
d. 3.0 M

107. A fixed beam of uniform section is carrying a point load at its mid-span. If the moment of inertia of the middle half length is now reduced to half its previous value, then the fixed end moments will
a. increase
b. decrease
c. remain constant

d. change their direction

108. The moment at the indeterminate support of a two-span continuous beam of 6m each with simple support at the ends carrying UDL of 20 KN/m over only the left span is (flexural rigidity is the same for both the span)
a. 90 KN – m hogging
b. 45 KN – m hogging
c. 45 KN – m sagging
d. zero

109. A uniform beam of span L is rigidly fixed at both supports, it carries a UDL 'w'per unit length. The bending moment at mid span is
a. $\frac{wl^2}{8}$

b. $\frac{wl^2}{12}$

c. $\frac{wl^2}{16}$

d. $\frac{wl^2}{24}$

110. Clapeyron's theorem is applicable to

a. simply supported beam
b. propped cantilever beam
c. fixed and continuous beam
d. continuous beam only

111. Which of the following statements is correct?
a. In slope-deflection method, the force are taken as unknowns
b. In slope-deflection method, the joint rotations are taken as unknowns
c. slope-deflection method is not applicable for beans an frames having settlement supports
d. slope deflection method is also known as force method

112. A beam is hinged at end A and fixed at B. A moment M is applied at end A. What is the moment developed at end B?
a. –M
b. M
c. M/2
d. –M/2

113. The displacement method is also referred to as which one of the following?
a. minimum strain energy method
b. Maxwell-Mohr method
c. consistent deformation method
d. slope-deflection method

114. A beam carrier UDL throughout its length. In which of the following configuration will strain energy be maximum?
a. Cantilever
b. simply supported beam
c. propped cantilever
d. Fixed

115.By which one of the following methods an approximate quick solution

possible for frames subjected to transverse loads?
a. By cantilever or portal method
b. By strain energy method
c. By moment distribution method
d. By matrix method

116. An increase in temperature on the top fiber of a simply supported beam will cause
a. Downward deflection
b. Upward deflection
c. No deflection
d. Angular rotation

117. The moment distribution method in structural analysis falls in the category
a. Displacement method
b. Force method
c. Flexibility method
d. First order approximate method

118. Force method in structural analysis always ensures
a. Compatability of deformation
b. Equilibrium of forces
c. Kinematically admissible strain
d. Overall safety

119. What is the correct sequence of the following steps in the graphical determination of stresses in the members of a loaded plane truss?
1. Victor diagram to determine the end reactions
2. space diagram
3. Stress diagram
select the correct answer using the codes given below
a. 1,2,3
b. 1,3,2
c. 2,1,3
d. 2,3,1

120. When a load crosses a through type pratt truss in the direction left to right, the nature of force in any diagonal

member in the left half of the span would

a. change from compression to tension

b. change from tension to compression

c. always in compression

d. always in tension

121. Consider the following statements:
Williot –Mohr diagram is used to determine the deflection in

1. an arch 2. A truss 3. A rigid frame

Which of these is correct?

a. only 1

b. only 2

c. only 3

d. 1,2,3

122. What does Williot-Mohr diagram yield?

a. Forces in members of a truss

b. Moments in fixed beam

c. Reactions at the support

d. Joint displacement of a pin jointed plane frame

123. In a fillet weld, the weakest section is

a. Smaller size of fillet

b. Throat of the fillet

c. Side perpendicular to force

d. Side parallel to force

124. A ductile structure is defined as one for which the plastic deformation before fracture

a. is smaller than elastic deformation

b. vanishes

c. is equal to elastic deformation

d. is much larger than elastic deformation

125. Which one of the following method is not suited for structure subjected to impact and fatigue?

a. Simple design

b. Semi-rigid design

c. Rigid design

d. Plastic design

126. Upper yield point in a stress-strain curve in structural steel can be avoided by

a. cold working

b. hot working

c. quenching

d. galvanizing

127. The effective length of the fillet weld is

a. Total length$-2 \times$ throat size

b. Total length$-2 \times$ weld size

c. $0.7 \times$ total length

d. Total length- (weld size$\sqrt{2}$)

128. In a diamond riveting for a plate of width 'b' and rivet diameter 'd', the efficiency of the joint is given by

a. $\frac{(b-d)}{b}$

b. $\frac{(b-2d)}{b}$

c. $\frac{(b-d)}{d}$

d. $\frac{(b-2d)}{d}$

129. The permissible stresses in rivets under wind load conditions as per IS:800 can be exceeded by about

a. 15%

b. 25%

c. 33%

d. 50%

130. Which one of the following is the mode of failure in a fillet weld material?

a. Tension

b. shear

c. bearing

d. Crushing

131. Load on connection is not eccentric for

a. lap joint

b. Single cover butt joint

c. Double cover butt joint

d. All the above

132. The order of elongation which a specimen of mild steel undergoes before fracture is
a. 0.1%
b. 1%
c. 10%
d. 100%

133. The type of stress induced in the foundation belts fixing a column to its footing are
a. pure compression
b. bearing
c. pure tension
d. bending

134. A plate used to connect two or more structural members intersecting each other is termed as
a. Template
b. Base plate
c. Gusset plate
d. Shoe plate

135.For field rivets, the permissible stresses are reduced by what percentage?
a. 10%
b. 15%
c. 25%
d. 33%

136. A steel plate 300mm wide and 10mm thick. A rivet of nominal diameter of 16mm is driven into it. What is the net sectional area of the plate?
a. 2600 mm^2
b. 2760 mm^2
c. 2830 mm^2
d. 2840 mm^2

137. A bolt designed as Hex bolt M16 × 70 will have
a. diameter of 16mm
b. diameter of 70mm
c. length of 16mm
d. area of 16×70 cm^2

138. The effective throat thickness of a fillet weld depends upon
a. angle between fusion faces
b. length of weld
c. permissible shear stress
d. type of weld

139. When the load line coincides with the centroid of the rivet group, the rivets are subjected to
a. shear only
b. tension only
c. bending only
d. shear as well as tension

140. The working stress for structural steel in tension is of the order of
a. 15 N/mm^2
b. 75 N/mm^2
c. 150 N/mm^2
d. 750 N/mm^2

141. As per the elastic theory of design, the factor of safety is the ratio of
a.working stress to stress limit of proportionality
b. yield stress to working stress
c. ultimate stress to working stress
d. ultimate load to load at yield

142. The centre to centre maximum distance between bolts in tension member of thickness 10 mn is
a. 200 mn
b. 160 mn
c. 120 mn
d. 100 mn

143. What is the allowable direct tensile stress in structural steel?
a. $0.45 fy$
b. $0.6\, fy$
c. $0.66\, fy$
d. $0.80\, fy$

144. How are structural members composed of two angles back to back connected throughout their length?
a. By locking rivets
b. By spacing rivets
c. By gripping rivets
d. By tacking rivets

145. M60 structural steel tube has a radius of gyration 20 mn. The length upto which the tube can be used as a compression member is
a. 3.6 m
b. 5.0 m
c. 6.0 m
d. 7.2 m

146. The elements that are normally subjected to combined bending and axial forces are
a. Struts in Reinforced concrete members
b. The members of long span bridges
c. Columns in framed structures
d. Space truss member

147. The slenderness ratio (as per IS:800) of a member carrying compressive loads arising from combined dead loads and imposed loads, should not exceed
a. 180
b. 250
c. 350
d. 380

148. Localized bearing stress caused by transmission of compression from the wide flange to narrow web causes a failure called?
a. Web buckling
b. Web shear flow
c. Web bearing
d. Web crippling

149. Lacing of compound steel column
a. Increases the load carrying capacity
b. Decreases the chances of local buckling
c. Decreases the overall buckling of the column

d. Assures unified behavior

150. Battens provided for compression member shall be designed to carry a transverse equal to
a. 2.5% of axial force in member
b. 5% of axial force in member
c. 10% of axial force in member
d. 20% of axial force in member

151. The batten plates used to connect the components of a built-up column are designed to resist
a. Longitudinal shear only
b. Transverse shear only
c. Longitudinal shear and moment arising from transverse shear
d. Vertical shear only

152. For an I-beam, the shape factor 1.12, the FOS in bending stress is 1.5. If the allowable stress is increased by 20% for wind or earthquake loads, then the load factor is
a. 1.10
b. 1.25
c. 1.35
d. 1.40

153. The allowable shear stress in stiffened web of mid-steel beams decreases with
a. Decrease in the spacing of the stiffness
b. Increase in the spacing of the stiffness
c. Decrease in the effective Depth
d. Increase in the effective Depth

154. The allowable shear stress in the web of mid steel beams decreases with
a. Decrease in h/t ratio
b. Increase in h/t ratio
c. Decrease in thickness
d. Increase in height

155. according to IS: 875 part 3, design wind speed is obtained by multiplying the basic wind speed by factors k_1, K2 and k_3, where k_3 is
a. terrain height factor
b. topography factor
c. structure size factor

d. risk coefficient

156. In a plate grinder, the web is primarily designed to resist
a. torsional moment
b. shear force
c. bending moment
d. diagonal buckling

157. A welded plate girder, consisting of two flange plates of 350mm✕16mm each and a web plate of 1000mm ✕ 6mm requires
a. no stiffness
b. horizontal stiffness
c. intermediate vertical stiffness
d. vertical and horizontal stiffness

158. Horizontal stiffness in a plate girder is provided to safeguard against web buckling due to
a. shear
b. compressive force in buckling
c. tensile force in bending
d. heavy concentrated load

159. The serviceability criterion for a plate girder design is based upon
a. width of flange
b. depth of web
c. minimum thickness of web
d. stiffness of web

160. A building with a gabled roof will experience pressure on its leeward slope which is
a. always positive
b. always negative
c. sometimes positive otherwise negative
d. zero

161. The thickness of web for unstiffined plate girder with clear distance 'd' between the flanges shall be not less than
a. $\dfrac{d}{200}$

b. $\dfrac{d}{85}$

c. $\dfrac{d}{100}$

d. $\dfrac{d}{160}$

162. The mechanism method and statical method guide in estimating
a. the lower and upper bound respectively on the strength
b. the upper and lower bound respectively on the strength of the structure
c. the lower bound on strength of structure
d. the upper bound on strength of structure

163. If the shape factor of a section is 1.5 and the FOS to be adopted is 2, then the load factor will be
a. 3
b. 4
c. 1.5
d. 2

164. The number of plastic hinges required in a structure of indeterminate status for a mechanism to develop is
a. i
b. $i+1$
c. $i+2$
d. $i-l$

165. In limit state approach, spacing of main reinforcement controls primarily
a. Cracking
b. Deflection
c. Durability
d. Collapse

166. In a R.C section under flexure, the assumption that "a plane section before bending remains plane after bending" leads to
a. Strain distribution being linear across the depth
b. Stress distribution being linear across the depth
c. Both stress and strain distribution being linear across the depth
d. Shear stress distribution being uniform along the depth

167. Grade of steel is designated a Fe 415, if
a. The upper yield stress is 415 N/mm²
b. The ultimate stress is 415 N/mm²
c. The primary FOS is 1.15
d. The characteristics strength is 415 N/mm²

168. The minimum grade of RCC in sea water as per IS 456-2000 is
a. M15
b. M20
c. M30
d. M40

169. Which one of the following state falls under the 'limit state of serviceability' as per IS-456?
a. Stability under load
b. Loss for equilibrium
c. Floor vibration
d. Formation of mechanism

170. Which one of the following sections performs better on ductility criterion?
a. balanced section
b. Over-reinforced section
c. Under-reinforced section
d. Non-prismatic section

171. What is the value of flexural strength of M25 concrete?
a. 4.0 MPa
b. 3.5 MPa
c. 3.0 MPa
d. 1.75 MPa

172. 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.

173. How can shear strength be ensured in a beam?
a. By providing Bending wire on main bars
b.By providing HYSD bars instead of mild steel bars
c. By providing rounded aggregate
d. By providing stirrups

174. When is an RCC roof slab designed as a two way slab?
a. If the slab is continuous over two opposite edges only
b. If the slab is unsupported at one edge only
c. If the ratio of spans in two directions is >2
d. If the ratio of spans in two directions is<2

175. Torsion reinforcement provided at the corners of two-way slab
a. distributes bending moment uniformly
b. prevents corners from lifting
c. controls cracking at corners
d. both (b) and (c)

176. As per IS-456P:2000, side face reinforcement in a beam is provided where depth of the web exceeds
a. 750 mm
b. 250 mm
c. 500 mm
d. 1000mm

177. Critical section for shear in case of flat slabs is
a. at a distance of effective depth of slab from the periphery of the column the drop panel
b. at a distance of d/2 from the periphery of the column/the capital/the drop panel
c. at the drop panel of the slab
d. at the periphery of the column

178. A reinforced concrete slab is 75mm thick. The maximum size of reinforcement bar that can be used is
a. 6mm diameter
b. 8mm diameter

c. 10mm diameter

d. 12mm diameter

179. What is the anchorage value of standard hook of a reinforcement bar of diameter D?

a.4D

b. 3D

c. 12D

d. 16 D

180. Lap length of reinforcement in compression shall not be less than

a. 30ϕ

b.24 ϕ

c. 20 ϕ

d. 15 ϕ

181. What is the minimum number of longitudinal bar provided in a reinforced concrete column of circulars?

a.4

b.5

c.6

d.8

182. What is the effective height of free standing masonry wall for the purpose of computing slenderness ratio?

a. 0.5 L

b.1.0 L

c. 2.0 L

d. 2.5 l

183. Minimum clear cover (in mm) to the main steel bars in slab beam, column and footing respectively are

a. 10,15, 40 & 25

b. 15, 25, 40 & 75

c.20, 25, 30 & 40

d. 20, 30, 40 & 75

184. According to IS 456:2000, minimum slenderness ratio for a short concrete column is

a. less than 12

b. between 12 and 18

c. between 18 and 24

d. more than 24

185. Spalling stress are produced in post tensioned pre- stressed concrete members because of

a. bursting force

b. highly concentrated tendon force

c. inadequate anchor block

d. maximum shear zone

186. A concordant cable profile in pre-stressed concrete is

a. parallel to the beam axis

b. one which coincides with the centroidal axis of beam

c. one which does not cause secondary stresses

d. one which eliminates primary stresses

187. Spalling stress are produced in post tensioned pre- stressed concrete members at

a. locations of maximum bending moment

b. locations of maximum shear zone

c. anchorage zone

d. bond developing zone

188. In a pre- stressed member, it is advisable to use

a. low-strength concrete

b. high- strength concrete

c. high- strength concrete and high tension steel

d. . high- strength concrete and low- tension steel

189. In case of pre stressed concrete members, the bursting stress develops at

a. bond zone

b. maximum bending moment zone

c. maximum shear stress zone
d. anchorage zone

190. A pre-stressed concrete section is said to have failed in strength at the moment when all the material in the section has exhausted its
a. stress limitations
b. strain limitations
c. stress as well as strain limitations
d. local limitations

191. The transmission length requirement is to be satisfied in the design of
a. pre- tensioned concrete beam
b. post- tensioned concrete beam
c. unbounded pre- tensioned concrete beams
d. post- tensioned continuous concrete beam

192. What is the allowable upward deflection in a pre-stressed concrete member under serviceability limit state condition?
a, span/250
b. span/300
c. span/ 350
d. span/ 500

193. What is the limiting principle tensile stress in pre-stressed uncracked concrete member of M25 grade?
a. 1 MPa
b. 1.5 MPa
c. 2 MPa
d. 2.5 MPa

194. At the time of initial tensioning, the maximum tensile stress immediately behind the anchorage should not exceed which one of the following
a. o.50× ultimate tensile stress
b. 0.60× ultimate tensile stress

c.0.70× ultimate tensile stress
d. 0.80× ultimate tensile stress

195. High strength steel used in pre-stressed concrete can take how much maximum strain?
a.2%
b.3%
c.4%
d.6%

196. Functional organization system of working was introduced by
a. F. W Taylor
b. Henery Gnatt
c. N. R Walker
d. J. E Kelly

197 Gnatt chart indicate
a. Comparison of actual progress with the scheduled progress
b. balance of work to be done
c. progressive cost of project
d. inventory costs

198. For a given the optimistic time, pessimistic time and the most probable estimates are 5,17 and 8 days respectively. The expected time is
a. 8 days
b. 9 days
c.10 days
d. 15 days

199. In PERT analysis, the time estimates of activities and probability of their occurrence follow
a. normal distribution curve
b. B- distribution curve

c. Poisson's distribution curve
d. Binomial distribution curve

200. The optimistic, the most likely time
and the pessimistic time estimates in
network are 4,5,8 month respectively
the expected time is
a. 4 months
b.5.33 months
c. 5.67 months
d. 7 months