(1) સરદાર પ્રજનુસિરખત 100 અનુંચય પ્રેસ આહેલ. ઉદ્યોગસર્વો પ્રતાંચા ઉપર લિખિતા સુધીવાત કરનારાં પૂર્વ પ્રેસે આહેલ કિમબા નાહી યાંથી ખાશે કરનાર ગ્રાંથી. અસા તથા અન્ય કાઢા દ્વારા આદિત્યાપ મો પ્રજનુસિરખતા સમગ્ર સેટ્સ હું લિખી બદલાય ગ્રાંથી.

(2) આપણ પ્રીતિ-પ્રજનુસિરખત હાં ચીનકોચાને ન વિવિષતા બોલેલાં શિકારાય.

(3) આ છાપણાં પ્રજનુસિરખતા કિમબા તમચા ઉતરપ્રીંબાર વષલાં જાગી ઉતરપ્રીંબાર સુખનીંપ્રાણ ન વિસ્તાર નમૂદ કરાય.

(4) યા પ્રજનુસિરખતલી પ્રયોજન 4 પાઠદરી ઉને સુખનિંદલી અમન્ત લાઇન 1, 2, 3 આસે ક્રમે ઘરલે આહેલ. લાય ચાર ઉદ્યોગીય સ્વાભાવિક યોગ ઉતાલા કિમબા ઉતરપ્રીંબાર સુખનીંપ્રાણ સુખનિંદલી ઉતરપ્રીંબાર નમૂદ કરાય. અસા પ્રકૃતે ઉતરપ્રીંબાર ઉતરપ્રીંબાર નમૂદ કરાયા તો સમર્થિતણ પ્રજનુસિરખતલી હાં કરનાર દર્શિલા જાઇ યાંથી કાઢાય ગ્રાંથી. હાં. આતિ વિવિષત કાયદા શિકારે બોલેલાં વાપરાયે, પોશાક વા શિકારે પણ વાપર ને વાપર ને.

(5) સરદાર પ્રોંસીઝ શીખવા આહેલ. એકસર સર પ્રજનુસિરખત સર દ્વારા. શાયી પુસલ શીખવા આહેલ યાંથી દ્રાક્ષા લેનાર શિક્ષણ તપાસ વેચી યાં સુખનીંપ્રાણ પ્રજનુસિરખતલી જાઇ. અના પ્રકૃતે શીખવા પ્રજનુસિરખત સોઝીઝનો પ્રયોજન ચાર ચૂકીયા ઉતરપ્રીંબાર એકા પ્રયોજન શીખવા કરવા હેઠળે ઇનકલિયામણ માને \\

\begin{tikzpicture}
\node at (0,0) {\textbf{પુસ્તકના પ્રજનુસિરખતાની અંતમ પૃષ્ઠાવર પહા}};
\end{tikzpicture}
1. Consider the following statements:
   (a) The melting point of mild steel is 1400°C
   (b) The ultimate compressive strength of mild steel is 80 to 120 KN/cm²
   Now state whether:
   (1) (a) True, (b) False  (2) (a) False, (b) False
   (3) (a) True, (b) True  (4) (a) False, (b) True

2. The bearing capacity of soil can be determined by:
   (1) method of loading  (2) plate load test
   (3) both (1) and (2)  (4) none of the above

3. For what span is the Queen Post roof truss suitable?
   (1) 5 to 9 m  (2) 9 to 14 m
   (3) 14 to 18 m  (4) none of the above

4. What is a Header as seen in elevation of wall?
   (1) Longer face of brick
   (2) Horizontal distance between vertical joints of successive brick courses
   (3) Lower surface of brick when laid flat
   (4) Shorter face of brick

5. What is the temperature range in the low temperature tempering process?
   (1) 150°C to 200°C  (2) 200°C to 250°C
   (3) 160°C to 150°C  (4) 250°C to 300°C

6. In site exploration, method of open trial pits is adopted up to a depth of:
   (1) 3 m  (2) 6 m  (3) 10 m  (4) 15 m

SPACE FOR ROUGH WORK

P.T.O.
7. A distemper is composed of a base with:
   (1) Chalk       (2) Water       (3) Casein       (4) Glue

8. What causes Bulking of sand?
   (1) Surface moisture     (2) Clay content
   (3) Air voids            (4) Viscosity

9. For what span is the king post roof truss suitable:
   (1) 5 to 9 m           (2) 9 to 14 m
   (3) 14 to 18 m         (4) none of the above

10. The reflected sound concentrated at one point creates a spot which is known as:
   (1) Dead spot         (2) Sound foci    (3) Sound echo
   (4) Acoustics

11. The common criterion for size of doors used in India is:
   (1) Width = [0.40 to 0.60] height
   (2) Height = [width + 1.2 meter]
   (3) Both (1) and (2)
   (4) None of the above

12. What is the recommended slump value for rigid pavement construction?
    (1) 40 to 50 mm         (2) 10 to 25 mm
    (3) 25 to 50 mm         (4) 20 to 40 mm

13. What is strengthening the shallow foundations of an existing building called?
    (1) Scaffolding       (2) Staging
    (3) Underpinning      (4) Bracing

14. What is the average thickness of first coat of cement mortar plaster on brick masonry?
    (1) 10 mm            (2) 8 mm
    (3) 20 mm            (4) 12 mm

SPACE FOR ROUGH WORK
15. What is the Diamond bit used as cutting tool in core drilling called?
   (1) Shot  (2) Bort  (3) Port  (4) Bortz

16. How is the Zone between parallels of latitude 23° 27' N and 23° 27'S known as?
   (1) Torrid Zone  (2) North Temperate Zone
   (3) South Temperate Zone  (4) North Frigid Zone

17. In a flitchted beam, one section is reinforced with another section. The purpose of such a composite beam is to improve
   (1) Shear force over the section  (2) Moment of Resistance over the section
   (3) Appearance of the section  (4) All of these

18. A column of length 'L' is fixed at bottom and hinged at top then the equivalent length of column is taken as:
   (1) L  (2) 2L  (3) L/2  (4) L/√2

19. A circular rod of length 1m is fixed at the top and a collar is provided at the bottom. An instantaneous stress developed in the rod due to releasing load is 400 MPa. If the diameter of rod is 10 mm. Find the strain energy stored in the rod. (E=200 GPa).
   (1) 5π  (2) 10π  (3) 12π  (4) 15π

20. If a cantilever beam is subjected to a point load at its free end, then the shear force under the point load is:
   (1) zero  (2) less than the load
   (3) equal to the load  (4) more than the load

SPACE FOR ROUGH WORK

P.T.O.
21. The bulk modulus of an elastic body subjected to normal tensile stresses in all directions
(x, y and z) is ________.

Where \( \mu \) - poisson’s ratio and E - young’s modulus.

\[
\begin{align*}
(1) & \quad \frac{\mu E}{3(\mu - 2)} \\
(2) & \quad \frac{\mu E}{3(\mu + 2)} \\
(3) & \quad \frac{E}{3(1 - 2\mu)} \\
(4) & \quad \frac{E}{2(1 + \mu)}
\end{align*}
\]

22. Two bars of the same size but of different materials are subjected to the same tensile force.
If the bars have their axial elongation in the ratio of 2 : 3, the ratio of modulus of elasticity
of the two materials will be:

\[
\begin{align*}
(1) & \quad 2 : 3 \\
(2) & \quad 3 : 2 \\
(3) & \quad 6 : 4 \\
(4) & \quad 4 : 10
\end{align*}
\]

23. If a metal bar fixed at either ends is cooled by reducing the temperature by 30°C, the
nature of the stresses developed in the bar will be:

\[
\begin{align*}
(1) & \quad \text{Tensile} \\
(2) & \quad \text{Compressive} \\
(3) & \quad \text{Zero} \\
(4) & \quad \text{None of the above}
\end{align*}
\]

24. A beam of span ‘L’ is simply supported at ends A and B carries a point load at C at a
distance ‘a’ from A and ‘b’ from B. If a < b then the maximum deflection will occur:

\[
\begin{align*}
(1) & \quad \text{at C} \\
(2) & \quad \text{Between A and C} \\
(3) & \quad \text{Between B and C} \\
(4) & \quad \text{Any where along the span}
\end{align*}
\]

25. A circular bar of length (l) uniformly tapers from diameter \( d_1 \) at one end to diameter \( d_2 \)
at the other end. If the bar is subjected to axial tensile force (p) then its elongation is equal
to ________ (\( d_1 > d_2 \))

\[
\begin{align*}
(1) & \quad \frac{PL}{AE} \\
(2) & \quad \frac{PL}{A_1A_2E} \\
(3) & \quad \frac{4PL}{\pi Ed_1d_2} \\
(4) & \quad \frac{PL}{4\pi Ed_1d_2}
\end{align*}
\]

SPACE FOR ROUGH WORK
26. When a body is subjected to the mutually perpendicular stresses \((\sigma_x\) and \(\sigma_y\)) then the centre of the mohr's circle from \(y\)-axis is taken as:

\[
\begin{align*}
(1) \quad & \frac{\sigma_x + \sigma_y}{2} \\
(2) \quad & \frac{\sigma_x - \sigma_y}{2} \\
(3) \quad & \frac{\sigma_x - \sigma_y}{2} + \tau_{XY} \\
(4) \quad & \frac{\sigma_x - \sigma_y}{2} - \tau_{XY}
\end{align*}
\]

27. What does moment area method find?

- (1) Bending moment of beam
- (2) Deflection of beam
- (3) Moment of Inertia
- (4) Reactions of beam

28. If a body is subjected to a direct normal stress of intensity \('\delta'\) along 'X' direction, then the intensity of maximum shear stress developed on the plane inclined at 45° to line of action of applied stress will be ________.

- (1) \(\delta\)
- (2) \(\frac{\delta}{2}\)
- (3) \(2\delta\)
- (4) \(0\)

29. If a circular shaft of diameter \((D)\) is fixed at one end and subjected to torsional moment \((T)\) at other end, then shear stress developed in shaft is:

- (1) \(16T/\pi D^3\)
- (2) \(\tau T/16D^3\)
- (3) \(32T/\pi D^4\)
- (4) \(16T/\pi D^4\)

30. Elongation of a circular rod tapering from zero at one end and diameter \('D'\) at the other end with \('\gamma'\) as the density and \('L'\) as the Length due to self weight is ________.

- (1) \(\frac{\gamma L^2}{2E}\)
- (2) \(\frac{L^2}{2\gamma E}\)
- (3) \(\frac{\sigma L}{\gamma E}\)
- (4) \(\frac{\gamma L^2}{\sigma E}\)

SPACE FOR ROUGH WORK

P.T.O.
31. The reaction for the support 'B' of a beam loaded as shown in fig. is:

\[ \begin{align*}
\text{(1)} & \quad 5000 \text{ N} \\
\text{(2)} & \quad 10000 \text{ N} \\
\text{(3)} & \quad 1250 \text{ N} \\
\text{(4)} & \quad 15000 \text{ N}
\end{align*} \]

32. In the cable shown in fig the minimum tension occurs at:

\[ \begin{align*}
\text{(1)} & \quad A \\
\text{(2)} & \quad B \\
\text{(3)} & \quad C \\
\text{(4)} & \quad \text{Between (A) and (C)}
\end{align*} \]

33. A beam AB of length 'L' is hinged at its ends and carries a transverse external loading such that the end 'B' is sunk by an amount 'S'. The fundamental slope-deflection equation is:

\[ \begin{align*}
\text{(1)} & \quad M_{AB} = \frac{2EI}{L} \left( \theta_A + 2\theta_B - \frac{3S}{L} \right) + M_{FAB} \\
\text{(2)} & \quad M_{AB} = \frac{3EI}{L} \left( 2\theta_A + \theta_B - \frac{3S}{L} \right) - M_{FAB} \\
\text{(3)} & \quad M_{AB} = \frac{3EI}{L} \left( 2\theta_A + \theta_B + \frac{3S}{L} \right) - M_{FAB} \\
\text{(4)} & \quad M_{AB} = \frac{2EI}{L} \left( 2\theta_A + \theta_B - \frac{3S}{L} \right) + M_{FAB}
\end{align*} \]
34. The degree of static indeterminancy in the frame shown in fig. is:

(1) 1  (2) 2  (3) 3  (4) Zero

35. A steel frame is shown in the figure. If joint 'O' of the frame is rigid, the rotational stiffness of the frame at point 'O' is given by:

\[ \frac{11EI}{l} \]  
(1) \( \frac{11EI}{l} \)  (2) \( \frac{10EI}{l} \)  (3) \( \frac{8EI}{l} \)  (4) \( \frac{6EI}{l} \)

36. Horizontal stiffness coefficient \( k_{11} \) of bar 'AB' is given by:

\[ \frac{AE}{l\sqrt{2}} \]  
(1) \( \frac{AE}{l\sqrt{2}} \)  (2) \( \frac{AE}{2l} \)  (3) \( \frac{AE}{l} \)  (4) \( \frac{2AE}{l} \)

SPACE FOR ROUGH WORK

P.T.O.
37. For a three hinged parabolic arch (span \( l \), rise \( h \)) carrying a uniformly distributed load \( w/\text{unit length} \) covering the entire span pick up the correct statement from the following:

(1) horizontal thrust is \( \frac{w{l}^2}{8h} \)
(2) S.F. will be zero throughout
(3) B.M will be zero throughout
(4) all the above

38. In moment distribution method of analysis, the following statement is true:

(1) The absolute stiffness of a prismatic bar with far end being fixed is \( \frac{4EI}{L} \)
(2) The absolute stiffness of a prismatic bar with far end being simply supported is \( \frac{3EI}{4L} \)
(3) The absolute stiffness of a prismatic bar with far end being pin-jointed is \( \frac{3EI}{L} \)
(4) All the above

39. Rotational stiffness coefficient \( K_{11} \) for the frame having two members of equal \( EI/l \) is given by:

![Diagram of a frame with rotational stiffness coefficient \( K_{11} \)]

(1) \( 5EI/l \)
(2) \( 6EI/l \)
(3) \( 7EI/l \)
(4) \( 8EI/l \)

SPACE FOR ROUGH WORK
40. A three hinged arch of span 20 m and rise 5 m is loaded as shown in fig. The horizontal thrust ‘H’ is:

![Arch Diagram]

(1) 75 t  (2) 100 t  (3) 125 t  (4) 50 t

41. For which structures influence lines are drawn?

(1) of any type  (2) statically determinate
(3) pin-jointed stress  (4) none of the above

42. The force in member AC of the truss shown in fig. is:

![Truss Diagram]

(1) 5t tension  (2) 4t compression
(3) 4t tension  (4) 5t compression

SPACE FOR ROUGH WORK

P.T.O.
43. A simply supported beam with an overhang is traversed by a unit concentrated moment from left to the right as shown below:

```
M=1
L/2

Direction of motion
```

The influence line for reaction at 'B' is given by

(1) \(-\frac{1}{2} \frac{1}{L}\)

(2) \(\frac{1}{L}\)

(3) \(\frac{1}{L}\)

(4) Zero everywhere

44. A two hinged parabolic arch of span 'l' and rise 'h' carries a load varying from zero at the left end and 'w' per unit run at the right end. The horizontal thrust is:

(1) \(wl^2/4h\)  (2) \(wl^2/8h\)  (3) \(wl^2/12h\)  (4) \(wl^2/16h\)

45. A cross section which can develop plastic moment of resistance but have inadequate plastic hinge rotation capacity for formation of plastic mechanism is called as:

(1) class 1 - plastic section  (2) class 2 - compact section
(3) class 3 - semi compact section  (4) class 4 - slender section

46. In plate girder, the web plate is connected to the flange plates by fillet weld. The size of fillet weld is designed to resist:

(1) The vertical shear force at the section
(2) The force causing buckling in the web
(3) The horizontal shear force between flange and web plate
(4) The bending stress in the flange

SPACE FOR ROUGH WORK
47. As per IS 800-2007, Tensile strength of a tension member is:
   (1) Strength corresponding to yielding of gross area
   (2) Strength corresponding to rupture at critical/net section
   (3) Strength corresponding to block shear failure
   (4) Minimum of all of the above

48. As per IS 800-2007 design strength of a fillet weld is given by \( f_{wd} = \frac{f_u}{\sqrt{3} \gamma_{mw}} \) where:
   (1) \( f_u \) is ultimate strength of weld and \( \gamma_{mw} \) is partial safety factor of weld
   (2) \( f_u \) is ultimate strength of parent material and \( \gamma_{mw} \) is partial safety factor of weld
   (3) \( f_u \) is smaller of ultimate strength of weld or parent material and \( \gamma_{mw} \) is smaller of partial safety factor of weld or parent material
   (4) \( f_u \) is smaller of ultimate strength of weld or parent material and \( \gamma_{mw} \) is partial safety factor of weld

49. On what basis is the thickness of base plate in a column base decided?
   (1) Flexure in base plate
   (2) Axial compression in base plate
   (3) Axial tension in base plate
   (4) Shear in base plate

50. As per IS 875-1984, if \( V_b = K_1 \cdot K_2 \cdot K_3 \). \( V_b \) represents design wind velocity then \( K_3 \) is
   (1) Risk co-efficient
   (2) Terrain, height and size co-efficient
   (3) Topography coefficient
   (4) None of the above

51. What is the intensity of imposed load on the plan area of a roof truss with \( 20^\circ \) slope? Consider that access is not provided except for maintenance:
   (1) 0.55 kN/m\(^2\)
   (2) 0.75 kN/m\(^2\)
   (3) 0.45 kN/m\(^2\)
   (4) 0.4 kN/m\(^2\)
52. A secondary beam ISMB 500 transmits end reaction to the web of main beam ISMB 500. Which of the following types of connection is advisable?

(1) Frame connection  (2) Unstiffened seat connection
(3) Stiffened seat connection  (4) Bracket connection

53. Maximum resultant shear force acting in a critical rivet/bolt for the following arrangement is:

\[ \text{AB} = 120 \text{ mm} \]
\[ \text{and BC} = 160 \text{ mm} \]

(1) 4P  (2) P  (3) 2P  (4) P/4

54. Match Group - I with Group - II

**Group - I**
(a) IS 800 - 2007
(b) IS 1893 - 2002
(c) IS 875 - 1987
(d) IS 456 - 2000

**Group - II**
(i) General constructions in steel - code of practice
(ii) Code of practice for design loads (other than earthquake) for building structures
(iii) Criteria for earthquake resistance design of structure
(iv) Plain and reinforced concrete - code of practice

Answer options:
(1) (i) (ii) (iii) (iv)
(2) (i) (iii) (ii) (iv)
(3) (i) (iii) (iv) (ii)
(4) (iv) (iii) (ii) (i)

**SPACE FOR ROUGH WORK**
55. A column section is built using two channels keeping back to back at such a spacing that it is equally strong with reference to both the axes. One Engineer suggests lacing while other suggests battens to connect two channels together. Keeping all other parameters same, which of the following is true:

(1) Laced column will carry more load than battened column
(2) Battened column will carry more load than laced column
(3) Capacity of a column is independent of lacing or batten
(4) None of above statements is true

56. What is the maximum permissible bearing pressure on concrete below the base plate in a column?

(1) $0.7 \sqrt{f_{ck}}$  (2) 0.446 $f_{ck}$  (3) 0.67 $f_{ck}$  (4) 0.6 $f_{ck}$

57. Which of the following is not a solution to limit the web crippling stresses within their permissible value?

(1) Increasing bearing length  (2) Selecting a beam with thicker web
(3) Providing a bearing stiffener  (4) Selecting a beam with wide flange

58. As per IS800-2007, the minimum diameter of rivet/bolt for joining compression members composed of two components back to back of thickness 10 mm, upto and including 16 mm is:

(1) 16 mm  (2) 22 mm  (3) 12 mm  (4) 20 mm

59. For comfortable ascent on stairs, the number of steps in each flight should not be greater than:

(1) 19  (2) 12  (3) 10  (4) 11

SPACE FOR ROUGH WORK

P.T.O.
60. A RC column 45 cm × 45 cm in section and reinforced with longitudinal reinforcement having 20 sq. cm sectional area is 5 m high. It is fixed at the bottom and perfectly free at top. If the max. allowable stresses are 42.2 kg/cm² and 948 kg/cm² in concrete and steel determine max. load carrying capacity:

(1) 48.5 tonnes  (2) 58.5 tonnes  (3) 65.5 tonnes  (4) 85.3 tonnes

61. In simply supported slab the purpose of providing distribution reinforcement is:

(1) To distribute the loads  (2) To distribute the shrinkage stress
(3) To distribute the temp. stresses  (4) All of the above

62. A T-beam of a roof is 76 cm deep upto centre of tensile steel and has a 152 cm wide flange which is 10 cm thick the width of web is 30 cm. In order to resist a moment of $4.5 \times 10^6$ kg cm safely, the minimum area of steel required would be approximately:

(1) 10 sq.cm  (2) 25 sq.cm  (3) 50 sq.cm  (4) 100 sq.cm

63. For dog legged stair case floor to floor height is 3.2 m. Rise : 160 mm, tread : 250 mm Depth of waist slab : 200 mm, L.L. =3 kN/m² F.F. 1 kN/m² total working load on stair case is about:

(1) 18 kN/m²  (2) 12 kN/m²  (3) 16 kN/m²  (4) 20 kN/m²

64. For counterfort Retaining wall, if l is clear distance between the counterfort and P is the intensity of soil pressure. The slab is designed for Bending Moments:

(1) Maximum +ve Bm and −ve Bm is $\frac{PL^2}{16}$ and $\frac{PL^2}{12}$
(2) Maximum +ve Bm and −ve Bm $\frac{PL^2}{24}$ and $\frac{PL^2}{12}$
(3) Maximum +ve Bm and −ve Bm $\frac{PL^2}{16}$ and $\frac{PL^2}{8}$
(4) Maximum +ve Bm and −ve Bm $\frac{PL^2}{24}$ and $\frac{PL^2}{8}$
65. In water retaining structures upto 100 mm thickness the minimum reinforcement in walls, floors and roofs in each of the two directions at right angle shall have minimum area equal to:

(1) 0.03% of the concrete section  
(2) 0.3% of the concrete section  
(3) 0.2% of the concrete section  
(4) 0.12% of the concrete section

66. In a retaining wall, keyed expansion and contraction joints should be provided at an interval of:

(1) 15 m  
(2) 20 m  
(3) 30 m  
(4) 45 m

67. An overhead water tank of capacity 40,000 litres is considered as a:

(1) small tank  
(2) medium tank  
(3) large tank  
(4) very large tank

68. While designing the isolated square column, if \( p' \) is the net upward reaction, \( a \) is the length of one side of the square footing of column of side \( b \) and \( d \) is the effective depth of footing, then the punching shear is given by:

(1) \( p'(a^2 + b^2)/4ad \)  
(2) \( p'(a^2 - b^2)/4bd^2 \)  
(3) \( p'(a^2 - b^2)/4bd \)  
(4) \( p'(a - b)^2/4bd \)

69. A rectangular beam simply supported over a span of 6 m is provided with tensile reinforcement only. The beam 200 mm wide and 365 mm deep (effective) consists of 4 no. 16 \( \phi \), the beam carries a load of 8 kN/m inclusive of self weight and \( m=13 \). The maximum Bending moment:

(1) \( 36 \times 10^8 \) N mm  
(2) \( 36 \times 10^7 \) N mm  
(3) \( 36 \times 10^6 \) N mm  
(4) \( 36 \times 10^4 \) N mm

SPACE FOR ROUGH WORK
70. A RC beam 25 cm × 50 cm in section has a clear span of 5 m and carries a load of 3000 kg/m it is reinforced with 8 bars of 12 mm dia at the bottom and depth of N.A. below the top is 23 cm. The per bend stress is 10 kg/cm². The number of bars that should be bent to take the diagonal tension would be:

(1) 02  (2) 03  (3) 04  (4) 05

71. In case of RC footing on soils it is usual to keep a minimum overall depth at the edges equal to:

(1) 5 cm  (2) 10 cm  (3) 15 cm  (4) 25 cm

72. Critical section for shear in case of flat slab is at a distance of:

(1) effective depth of slab from periphery of column or drop panel
(2) d/2 from periphery of column or capital
(3) at the drop panel of slab
(4) at the preiphery of column

73. The approximate loss of prestress due to the slippage of anchorage in long span prestressed concrete is generally in the range of:

(1) 1 to 3 percent  (2) 3 to 5 percent
(3) 5 to 8 percent  (4) 8 to 12 percent

74. A pretensioned T-section has a flange of 1200 mm wide and 150 mm thick width of rib 300 mm and depth 1600 mm, fpu = 1392 N/mm² Apw = 3182 mm², xu = 896mm, fck = 40N/mm². Flexural strength of the T-section is about:

(1) 9125 kN m  (2) 8000 kN m  (3) 7000 kN m  (4) 8250 kN m

SPACE FOR ROUGH WORK
75. What is the purpose of reinforcement in prestressed concrete?
   (1) to provide adequate bond stress
   (2) to resist tensile stresses
   (3) to impart initial compressive stress in concrete
   (4) all of the above

76. Most common method of prestressing used for factory production is:
   (1) Long Line Method
   (2) Freyssinet system
   (3) Magnel Blaton system
   (4) Lee - Macall system

77. For small span girders with straight tendons approximate thickness of web is. If $v_u = 28 \times 10^5 \text{N}$, $f_t = 1.7 \text{N/mm}^2$ depth of girder = 320 mm
   (1) 44 mm
   (2) 60 mm
   (3) 75 mm
   (4) 30 mm

78. A pretensioned prestressed concrete beam having rectangular section $150 \text{ mm} \times 350 \text{ mm}$ deep has an effective cover of 50 mm $f_{ck} = 40 \text{N/mm}^2$, $f_{pu} = 1253 \text{ N/mm}^2$, $A_p = 461 \text{ mm}^2$, $x_u = 234.9$ ultimate strength of the section using IS code is:
   (1) 116 kN m
   (2) 140 kN m
   (3) 200 kN m
   (4) 190 kN m

79. For post tensioned member the minimum 28 day cube strength as per IS code is:
   (1) 20 N/mm$^2$
   (2) 30 N/mm$^2$
   (3) 40 N/mm$^2$
   (4) 50 N/mm$^2$

80. An eccentric tendon anchored perpendicular to the plane of concrete at the end section in prestressed beams introduces:
   (1) compression
   (2) bending and compression
   (3) compression, bending and shear
   (4) tension and shear

SPACE FOR ROUGH WORK
81. According to IS 1343-1980, the bearing stress shall not exceed:

1. \(0.48 \text{fci} \times \sqrt{\text{Abr/A punch}}\) or 0.8 fci
2. \(0.6 \text{fci} \times \sqrt{\text{Abr/A punch}}\) or 0.85 fci
3. \(0.7 \text{fci} \times \sqrt{\text{Abr/A punch}}\) or 0.8 fci
4. \(0.48 \text{fci} \times \sqrt{\text{Abr/A punch}}\) or 0.9 fci

82. In case of prestressed concrete beams (girder) the lever arm is:

1. Always constant
2. Negligibly small
3. Subject to change as the load on the girder changes
4. does not exist in the absence of live load

83. In High - tensile steel final stress after allowing for all losses of prestress (As per IS 1343 - 1980):

1. Not less than 50% of the characteristic tensile strength of tendons
2. Not less than 20% of the characteristic tensile strength of tendons
3. Not less than 45% of the characteristic tensile strength of tendons
4. Not less than 30% of the characteristic tensile strength of tendons

84. The approximate total percentage loss of prestressed in post-tensioned concrete beam is nearly in the range:

1. 5 to 10 percent
2. 10 to 15 percent
3. 15 to 20 percent
4. 20 to 25 percent

85. For long span girders with curved cables approximate thickness of web for the following data (\(V_u = 450 \text{kN}, \text{ft} = 1.7 \text{N/mm}^2\), depth of girder 1300 mm) is:

1. 170 mm
2. 200 mm
3. 120 mm
4. 300 mm

SPACE FOR ROUGH WORK
86. The bursting stresses in prestressed concrete members are developed at:

(1) Bond zone  (2) Maximum shear zone
(3) Anchorage zone  (4) Maximum bending moment zone

87. What are the main resources required for construction industry?

(1) manpower and material  (2) manpower and machinery
(3) machinery and material  (4) all the above

88. Which of the following control charts is suitable to control the defects per unit?

(1) $\bar{X}$ and R chart  (2) P chart  (3) np chart  (4) C chart

89. What does the direct cost of project include?

(1) labour cost  (2) material cost  (3) equipment cost  (4) all the above

90. Consider the following statements:

(a) Critical path is longest path in network

(b) Critical path is obtained by joining the event having zero or minimum slack. Now state whether

Answer options:

(1) (a) True, (b) True  (2) (a) False, (b) False
(3) (a) True, (b) False  (4) (a) False, (b) True

91. Which of the following is shown on site layout for allocation of site space?

(1) material storage  (2) working areas
(3) circulation areas  (4) all the above

SPACE FOR ROUGH WORK

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92. Consider the following statements:

(a) FERT is activity oriented network diagram
(b) CPM is event oriented network diagram

Now state whether:

Answer options:

(1) (a) true, (b) true
(2) (a) true, (b) false
(3) (a) false, (b) false
(4) (a) false, (b) true

93. What are the objectives of construction management:

(1) High Quality Workmanship
(2) Motivating people
(3) Taking sound decisions
(4) all of the above

94. Which of the following terms represents the settlement of disputes by unofficial persons chosen by the parties?

(1) Force Mojure
(2) Arbitration
(3) Indemnification
(4) contract

95. What is the formula for free float?

(1) F.F. = T^i_L - T^i_E - t_ij
(2) F.F. = T^i_E - T^i_L - t_ij
(3) F.F. = T^i_E - T^i_L - t_ij
(4) F.F. = T^i_L - T^i_E - t_ij

96. What type of a drill is the Jack hammer?

(1) Abrasion
(2) Churn
(3) Shot
(4) Percussion

SPACE FOR ROUGH WORK
97. Consider the following statements:

(a) Up to certain duration direct cost decreases, and there - after it starts increasing

(b) Total cost of the project is a sum of direct costs and indirect costs.

Now state whether:

(1) (a) true, (b) true  
(2) (a) true, (b) false

(3) (a) false, (b) false  
(4) (a) false, (b) true

98. The purpose of job layout is to facilitate the realisation of:

(1) reduction in completion time

(2) high productivity from labour and machinery

(3) both (1) and (2)

(4) none of the above

99. Well points operate satisfactorily if they are installed in:

(1) silt  
(2) clay  
(3) sand  
(4) rock

100. Which of the following effects is produced due to compaction by pneumatic tired rollers?

(1) Static weight  
(2) Impact  

(3) Kneading action  
(4) Vibration

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P.T.O.
शूचना — (पृष्ठ 1 वस्त्र पुढ़े....)

(8) प्रस्तुतपुस्तकेके मध्ये विहित केलेल्या विषयात जागीच कधी काम (रफ चर्क) करतात. प्रस्तुतपुस्तकेके विभिन्न उत्तरपत्रीकेचे वा इतर कागदात कधी काम केल्यास ते कांधी कारणाचा उदाहरण केला आहे, असे मानते जाईल व त्याच्या उदेश्याचा उदाहरण जारी केलेल्या "परिस्थितीमध्ये होणारा नैपर्कारणा प्रतिवेदन कारणात बाबुनारे अभिनयम-82" याचीही तरुणदीनुसार कारवाई कारणात येईल व दोघो व्यक्ती कामात एक वर्णाच्या कारणासाठी आणि/किंवा रूपात एक जहाज रकमेच्या दंडावय शिक्षक पात्र होईल.

(9) सदर प्रस्तुतपत्रीकेकांतीला आयोगाचे विहित केलेल्या वेळा संपत्त्यावर उळवावानं ही प्रस्तुतपुस्तका स्वतः-बोध वाढतात. परिस्थितीकासहरे प्रेक्षण जागीच परवाहात आहे. मात्र परिस्थिती काहे जाणणाऱ्यांची म्हणजेच प्रेक्षणाच्या भाग-1 समवेश्याकाळ के न विस्तार घट कणाचे आवश्यक आहे.

रमुणा प्रश्न

Pick out the correct word to fill in the blank:

Q. No. 201. I congratulate you _________ your grand success.

(1) for (2) at (3) on (4) about

हा प्रस्ताव योग्य उत्तर "(3) on" असे आहे. त्यामुळे या प्रश्नाचे उत्तर "(3) on" होईल. याने काही तरी प्रथमांगे प्रश्न क्र. 201 समर्थरूप उत्तर-क्रमांक "(3) on" हे वर्तुळ पूर्णपणे चालूक्यत करून दाखविले आवश्यक आहे.

प्र. क्र. 201. ① ② ③ ④

अशा पद्धतीने प्रस्तुत प्रस्तुतपुस्तकेके विभिन्न प्रश्नाचा तुम्हाचा उत्तरक्रमांक हा तुम्हाच्या स्वतंत्रतील तुळ्यातील पुर्विकेळ्यात उत्तरपत्रीकेची त्याच्या प्रभावकारक मोठी उत्तरपत्रीकेच्या संविद्यालयात वर्तुळ पूर्णपणे चालूक्यत करून दाखविले. हाकरतीचा फक्त काहीयो शाहीचे बोलून वापरायचे, पेनेस्कर वा शाहीचे पेन वापर नये.