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प्रश्नपुस्तिका क्रमांक
BOOKLET NO.

प्रश्नपुस्तिका

स्थापत्य अभियांत्रिकी

पेपर-I

वेळ : 2 (दोन) तास

एकूण प्रश्न : 100
एकूण गुण : 200

सूचना

(1) सदर प्रश्नपुस्तिकेत 100 अनिवार्य प्रश्न आहेत. उमेदवारांनी प्रश्नांची उत्तरे लिहिण्यास सुरुवात करण्यापूर्वी या प्रश्नपुस्तिकेत सर्व प्रश्न आहेत किंवा नाहीत याची खात्री करून घ्यावी. असा तसेच अन्य काही दोष आढळल्यास ही प्रश्नपुस्तिका समवेक्षकांकडून लगेच बदलून घ्यावी.

(2) आपला परीक्षा-क्रमांक ह्या चौकोनांत
न विसरता बॉलपेनने लिहावा.

परीक्षा-क्रमांक								

केंद्राची संकेताक्षरे

शेवटचा अंक

(3) वर छापलेला प्रश्नपुस्तिका क्रमांक तुमच्या उत्तरपत्रिकेवर विशिष्ट जागी उत्तरपत्रिकेवरील सूचनेप्रमाणे **न विसरता नमूद करावा.**

(4) या प्रश्नपुस्तिकेतील प्रत्येक प्रश्नाला 4 पर्यायी उत्तरे सुचविली असून त्यांना 1, 2, 3 आणि 4 असे क्रमांक दिलेले आहेत. त्या चार उत्तरांपैकी सर्वांत योग्य उत्तराचा क्रमांक उत्तरपत्रिकेवरील सूचनेप्रमाणे तुमच्या उत्तरपत्रिकेवर नमूद करावा. अशा प्रकारे उत्तरपत्रिकेवर उत्तरक्रमांक नमूद करताना तो संबंधित प्रश्नक्रमांकासमोर छायांकित करून दर्शविला जाईल याची काळजी घ्यावी. **ह्याकरिता फक्त काळ्या शाईचे बॉलपेन वापरावे, पेन्सिल वा शाईचे पेन वापरू नये.**

(5) सर्व प्रश्नांना समान गुण आहेत. यास्तव सर्व प्रश्नांची उत्तरे द्यावीत. घाईमुळे चुका होणार नाहीत याची दक्षता घेऊनच शक्य तितक्या वेगाने प्रश्न सोडवावेत. क्रमाने प्रश्न सोडविणे श्रेयस्कर आहे पण **एखादा प्रश्न कठीण वाटल्यास त्यावर वेळ न घालविता पुढील प्रश्नाकडे वळावे.** अशा प्रकारे शेवटच्या प्रश्नापर्यंत पोहोचल्यानंतर वेळ शिल्लक राहिल्यास कठीण म्हणून वगळलेल्या प्रश्नांकडे परतणे सोईस्कर ठरेल.

(6) उत्तरपत्रिकेत एकदा नमूद केलेले उत्तर खोडता येणार नाही. नमूद केलेले उत्तर खोडून नव्याने उत्तर दिल्यास ते तपासले जाणार नाही.

(7) प्रस्तुत परीक्षेच्या उत्तरपत्रिकांचे मूल्यांकन करताना उमेदवाराच्या उत्तरपत्रिकेतील योग्य उत्तरांनाच गुण दिले जातील. तसेच ''उमेदवाराने वस्तुनिष्ठ बहुपर्यायी स्वरूपाच्या प्रश्नांची दिलेल्या चार उत्तरापैकी सर्वांत योग्य उत्तरेच उत्तरपत्रिकेत नमूद करावीत. अन्यथा त्यांच्या उत्तरपत्रिकेत सोडविलेल्या प्रत्येक चार चुकीच्या उत्तरांसाठी एका प्रश्नाचे गुण वजा करण्यात येतील''.

ताकीद

ह्या प्रश्नपत्रिकेसाठी आयोगाने विहित केलेली वेळ संपेपर्यंत ही प्रश्नपुस्तिका आयोगाची मालमत्ता असून ती परीक्षाकक्षात उमेदवाराला परीक्षेसाठी वापरण्यास देण्यात येत आहे. ही वेळ संपेपर्यंत सदर प्रश्नपुस्तिकेची प्रत/प्रती, किंवा सदर प्रश्नपुस्तिकेतील काही आशय कोणत्याही स्वरूपात प्रत्यक्ष वा अप्रत्यक्षपणे कोणत्याही व्यक्तीस पुरविणे, तसेच प्रसिद्ध करणे हा गुन्हा असून अशी कृती करणाऱ्या व्यक्तीवर शासनाने जारी केलेल्या ''परीक्षांमध्ये होणाऱ्या गैरप्रकारांना प्रतिबंध करण्याबाबतचा अधिनियम-82'' यातील तरतुदीनुसार तसेच प्रचलित कायद्याच्या तरतुदीनुसार कारवाई करण्यात येईल व दोषी व्यक्ती कमाल एक वर्षाच्या कारावासाच्या आणि/किंवा रुपये एक हजार रकमेच्या दंडाच्या शिक्षेस पात्र होईल.

तसेच ह्या प्रश्नपत्रिकेसाठी विहित केलेली वेळ संपण्याआधी ही प्रश्नपुस्तिका अनधिकृतपणे बाळगणे हा सुद्धा गुन्हा असून तसे करणारी व्यक्ती आयोगाच्या कर्मचारीवृंदापैकी, तसेच परीक्षेच्या पर्यवेक्षकीयवृंदापैकी असली तरीही अशा व्यक्तीविरूद्ध उक्त अधिनियमानुसार कारवाई करण्यात येईल व दोषी व्यक्ती शिक्षेस पात्र होईल.

पुढील सूचना प्रश्नपुस्तिकेच्या अंतिम पृष्ठावर पहा

कच्च्या कामासाठी जागा /SPACE FOR ROUGH WORK

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/cm^2

   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 aobve

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) 100°C to 150°C

   (4) 250°C to 300°C

6. In site exploration, method of open trial pits is adopted upto 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

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8.   What causes Bulking of sand ?

   (1)   Surface moisture   (2)   Clay content

   (3)   Air voids   (4)   Viscosity

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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

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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)   Accostics

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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

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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

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13.   What is strengthening the shallow foundations of an existing building called ?

   (1)   Scaffolding   (2)   Staging   (3)   Underpinning   (4)   Bracing

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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

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16. How is the Zone between parallels of lattitude 23° 27'N and 23° 27'S known as ?

(1) Torrid Zone   (2) North Temperate Zone

(3) South Temperate Zone   (4) North Frigid Zone

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17. In a flitched 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 seciton   (4) All of these

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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) $L/\sqrt{2}$

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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

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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

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

   Where μ - poisson's ratio and E - young's modulus.

   (1) $\dfrac{\mu E}{3(\mu - 2)}$ (2) $\dfrac{\mu E}{3(\mu + 2)}$ (3) $\dfrac{E}{3(1 - 2\mu)}$ (4) $\dfrac{E}{2(1 + \mu)}$

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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 :

   (1) 2 : 3 (2) 3 : 2 (3) 6 : 4 (4) 4 : 10

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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 :

   (1) Tensile (2) Compressive

   (3) Zero (4) None of the above

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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 :

   (1) at C (2) Between A and C

   (3) Between B and C (4) Any where along the span

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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 _____ $(d_1 > d_2)$

   (1) $\dfrac{PL}{AE}$ (2) $\dfrac{PL}{A_1 A_2 E}$ (3) $\dfrac{4PL}{\pi E d_1 d_2}$ (4) $\dfrac{PL}{4\pi E d_1 d_2}$

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26. When a body is subjected to the mutually perpendicular stresses (σx and σy) then the centre of the mohr's circle from y-axis is taken as :

(1) $\dfrac{\sigma x + \sigma y}{2}$

(2) $\dfrac{\sigma x - \sigma y}{2}$

(3) $\dfrac{\sigma x - \sigma y}{2} + \tau XY$

(4) $\dfrac{\sigma x - \sigma y}{2} - \tau XY$

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 'δ' 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) δ

(2) $\dfrac{\delta}{2}$

(3) 2δ

(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) $\pi T/16D^3$

(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 'γ' as the density and 'L' as the Length due to self weight is _____.

(1) $\dfrac{\gamma L^2}{2E}$

(2) $\dfrac{L^2}{2\gamma E}$

(3) $\dfrac{\sigma L}{\gamma E}$

(4) $\dfrac{\gamma L^2}{\sigma E}$

SPACE FOR ROUGH WORK

P.T.O.

31. The reaction for the support 'B' of a beam loaded as shown in fig. is :
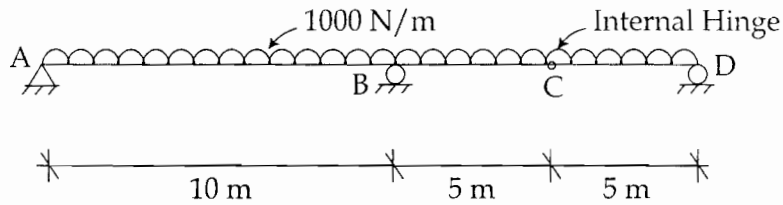
(1) 5000 N   (2) 10000 N   (3) 1250 N   (4) 15000 N

32. In the cable shown in fig the minimum tension occurs at :
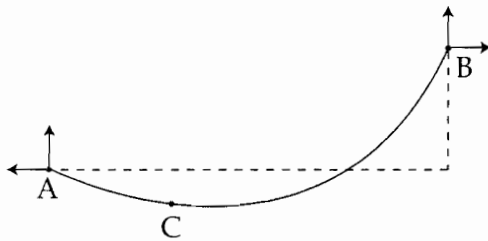
(1) A   (2) B

(3) C   (4) Between (A) and (C)

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 'δ'. The fundamental slope deflection equation is :

(1) $M_{AB} = \dfrac{2EI}{L} \left(\theta_A + 2\theta_B - \dfrac{3\delta}{L} \right) + M_{FAB}$

(2) $M_{AB} = \dfrac{3EI}{L} \left(2\theta_A + \theta_B - \dfrac{3\delta}{L} \right) - M_{FAB}$

(3) $M_{AB} = \dfrac{3EI}{L} \left(2\theta_A + \theta_B + \dfrac{3\delta}{L} \right) - M_{FAB}$

(4) $M_{AB} = \dfrac{2EI}{L} \left(2\theta_A + \theta_B - \dfrac{3\delta}{L} \right) + M_{FAB}$

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34. The degree of static indeterminancy in the frame shown in fig. is :
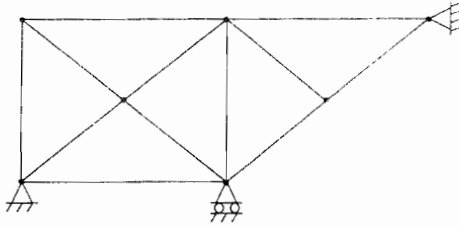
(1)   1   (2)   2   (3)   3   (4)   Zero

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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 :
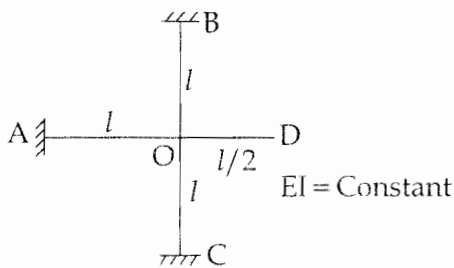
(1) $11EI/l$ (2) $10EI/l$ (3) $8EI/l$ (4) $6EI/l$

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36. Horizontal stiffness coefficient K_{11} of bar 'AB' is given by :
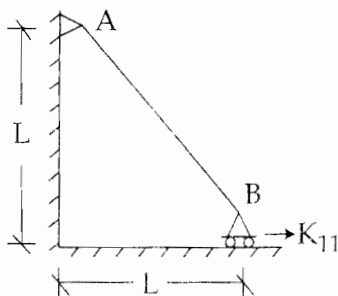
(1) $AE/l\sqrt{2}$ (2) $AE/2l$ (3) AE/l (4) $2AE/l$

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37. For a three hinged parabolic arch (span '*l*', rise h) carrying a uniformly distributed load w/unit length covering the entire span pick up the correct statement from the following :

   (1) horizontal thrust is $wl^2/8h$ (2) S.F. will be zero throughout

   (3) B.M will be zero throughout   (4) all the above

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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 4EI/L

   (2) The absolute stiffness of a prismatic bar with far end being simply supported is 3EI/4L

   (3) The absolute stiffness of a prismatic bar with far end being pin-jointed is 3EI/L

   (4) All the above

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39. Rotational stiffness coefficient K_{11} for the frame having two members of equal EI/*l* is given by :
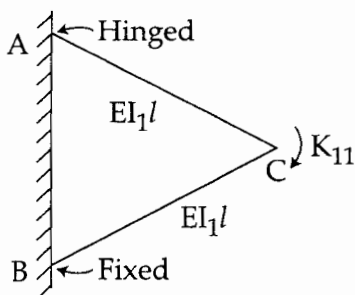
   (1) 5EI/*l*   (2) 6EI/*l*   (3) 7EI/*l*   (4) 8EI/*l*

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40. A three hinged arch of span 20 m and rise 5 m is loaded as shown in fig. The horizontal thrust 'H' is :
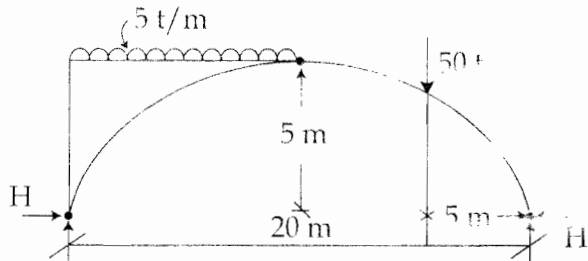
(1)   75 t   (2)   100 t   (3)   125 t   (4)   50 t

41. For which structures Influence lines are drawn ?

(1)   of any type   (2)   statically determinate

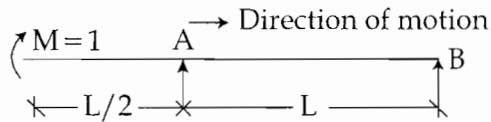(3)   pin - jointed stress   (4)   none of the above

42. The force in member AC of the truss shown in fig. is :
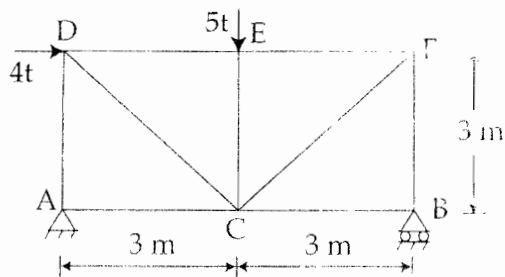
(1)   5t tension   (2)   4t compression

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

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

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

(1)

(2)

(3)

(4) Zero everywhere

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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) $wl^2/16h$

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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

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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

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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

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48. As per IS 800-2007 design strength of a fillet weld is given by $fwd = \dfrac{fu}{\sqrt{3}\ \gamma mw}$, where :

    (1) fu is ultimate strength of weld and γmw is partial safety factor of weld

    (2) fu is ultimate strength of parent material and γmw is partial safety factor of weld

    (3) fu is smaller of ultimate strength of weld or parent material and γmw is smaller of partial safety factor of weld or parent material

    (4) fu is smaller of ultimate strength of weld or parent material and γmw is partial safety factor of weld

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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

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50. As per IS 875-1984, If $V_z = K_1 . K_2 . K_3 . Vb$ represents design wind velocity then K_3 is _____.

    (1) Risk co-effecient   (2) Terrain, height and size co-effecient

    (3) Topography coefficient   (4) None of the above

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51. What is the intensity of imposed load on the plan area of a roof truss with 20° slope ? Consider that access is not provided except for maintenance :

    (1) 0.55 kN/m²   (2) 0.75 kN/m²

    (3) 0.45 kN/m²   (4) 0.4 kN/m²

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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 :

$AB = 120$ mm

and $BC = 160$ mm
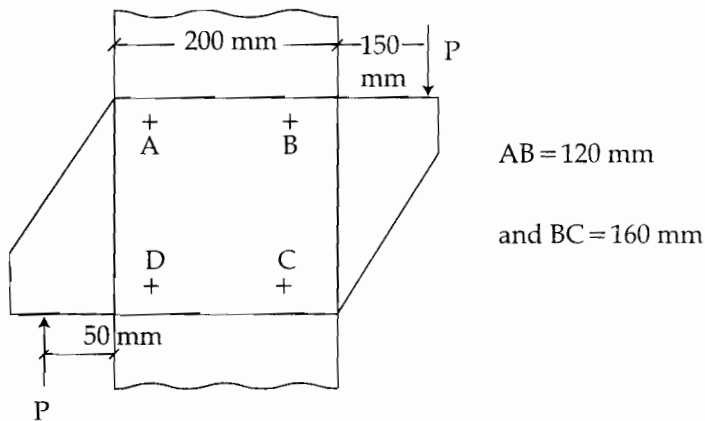
    (1) 4P   (2) p   (3) 2p   (4) p/4

54. Match **Group - I** with **Group - II**

Group - I		**Group - II**	
(a)	IS 800 - 2007	(i)	General constructions in steel - code of practice
(b)	IS 1893 - 2002	(ii)	Code of practice for design loads (other than earthquake) for building structures
(c)	IS 875 - 1987	(iii)	Criteria for earthquake resistance design of structure
(d)	IS 456 - 2000	(iv)	Plain and reinforced concrete - code of practice

Answer options :

	(a)	(b)	(c)	(d)
(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) $0.7\sqrt{fck}$ (2) 0.446 fck   (3) 0.67 fck   (4) 0.6 fck

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 ascend on stairs, the number of steps in each flight should not be greater than :

    (1) 09   (2) 12   (3) 10   (4) 11

SPACE FOR ROUGH WORK

P.T.O.

60. A RC column 45 cm × 45cm 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/ cm^2 and 948 kg/ cm^2 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 4.5×10^6 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/m^2 F.F. 1 kN/m^2 total working load on stair case is about :

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

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 $\dfrac{PL^2}{16}$ and $\dfrac{PL^2}{12}$

(2)   Maximum + ve Bm and − ve Bm $\dfrac{PL^2}{24}$ and $\dfrac{PL^2}{12}$

(3)   Maximum + ve Bm and − ve Bm $\dfrac{PL^2}{16}$ and $\dfrac{PL^2}{8}$

(4)   Maximum + ve Bm and − ve Bm $\dfrac{PL^2}{24}$ and $\dfrac{PL^2}{8}$

SPACE FOR ROUGH WORK

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 ϕ, the beam carries a load of 8 kN/m inclusive of self weight and m=13. The maximum Bending moment :

(1) 36×10^8N mm   (2) 36×10^7N mm

(3) 36×10^6N mm   (4) 36×10^4N 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 vu = 28×10^3N, ft = 1.7N/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 mm × 350 mm deep has an effective cover of 50 mm fck = 40N/mm^2 fpu = 1253 N/mm^2, Ap = 461 mm^2, xu=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) $0.48 \, fci \times \sqrt{Abr/A \, punch}$ or 0.8 fci

    (2) $0.6 \, fci \times \sqrt{Abr/A \, punch}$ or 0.85 fci

    (3) $0.7 \, fci \times \sqrt{Abr/A \, punch}$ or 0.8 fci

    (4) $0.48 \, fci \times \sqrt{Abr/A \, punch}$ 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 ($Vu = 450$ kN, $ft = 1.7 \, N/mm^2$, 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) $\overline{X}$ 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

92. Consider the following statements :

(a) PERT 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 unoffical persons chosen by the parties ?

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

95. What is the formula for free float ?

(1) $\text{F.F.} = T_L^j - T_E^i - t_{ij}$

(2) $\text{F.F.} = T_E^j - T_E^i - t_{ij}$

(3) $\text{F.F.} = T_E^j - T_L^i - t_{ij}$

(4) $\text{F.F.} = T_L^j - T_L^i - t_{ij}$

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

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

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97. Consider the following statements :

(a) Upto 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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सूचना — (पृष्ठ 1 वरून पुढे....)

(8) प्रश्नपुस्तिकेमध्ये विहित केलेल्या विशिष्ट जागीच कच्चे काम (रफ वर्क) करावे. प्रश्नपुस्तिकेव्यतिरिक्त उत्तरपत्रिकेवर वा इतर कागदावर कच्चे काम केल्यास ते कॉपी करण्याच्या उद्देशाने केले आहे, असे मानले जाईल व त्यानुसार उमेदवारावर शासनाने जारी केलेल्या ''परीक्षांमध्ये होणाऱ्या गैरप्रकारांना प्रतिबंध करण्याबाबतचे अधिनियम-82'' यातील तरतुदीनुसार कारवाई करण्यात येईल व दोषी व्यक्ती कमाल एक वर्षाच्या कारावासाच्या आणि/किंवा रुपये एक हजार रकमेच्या दंडाच्या शिक्षेस पात्र होईल.

(9) सदर प्रश्नपत्रिकेसाठी आयोगाने विहित केलेली वेळ संपल्यानंतर उमेदवाराला ही प्रश्नपुस्तिका स्वतःबरोबर परीक्षाकक्षाबाहेर घेऊन जाण्यास परवानगी आहे. **मात्र परीक्षा कक्षाबाहेर जाण्यापूर्वी उमेदवाराने आपल्या उत्तरपत्रिकेचा भाग-1 समवेक्षकाकडे न विसरता परत करणे आवश्यक आहे.**

नमुना 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

ह्या प्रश्नाचे योग्य उत्तर ''(3) on'' असे आहे. त्यामुळे या प्रश्नाचे उत्तर ''(3)'' होईल. यास्तव खालीलप्रमाणे प्रश्न क्र. 201 समोरील उत्तर-क्रमांक ''③'' हे वर्तुळ पूर्णपणे छायांकित करून दाखविणे आवश्यक आहे.

प्र. क्र. 201.　①　②　●　④

अशा पद्धतीने प्रस्तुत प्रश्नपुस्तिकेतील प्रत्येक प्रश्नाचा तुमचा उत्तरक्रमांक हा तुम्हाला स्वतंत्ररीत्या पुरविलेल्या उत्तरपत्रिकेवरील त्या त्या प्रश्नक्रमांकासमोरील संबंधित वर्तुळ पूर्णपणे छायांकित करून दाखवावा. **ह्याकरिता फक्त काळ्या शाईचे बॉलपेन वापरावे, पेन्सिल वा शाईचे पेन वापरू नये.**

कच्च्या कामासाठी जागा /SPACE FOR ROUGH WORK