पुस्तिका में पृष्ठों की संख्या : **16**
Number of Pages in Booklet : **16**
पुस्तिका में प्रश्नों की संख्या : **100**
No. of Questions in Booklet : **100**

परीक्षा दिनांक ५·११·१९ (अ)

प्रश्न-पत्र पुस्तिका संख्या /
Question Paper Booklet No.

Subject Code : 01

SVPC-91   3001809

विषय / SUBJECT :
CIVIL ENGINEERING

अभ्यर्थी/प्रिन्सिपल I.T.I. २०१८

समय : 2.00 घण्टे
Time : 2.00 Hours

अधिकतम अंक : **100**
Maximum Marks : 100

प्रश्न-पत्र पुस्तिका एवं उत्तर पत्रक के पेपर सील/पॉलिथीन बैग को खोलने पर परीक्षार्थी यह सुनिश्चित कर लें कि उसके प्रश्न-पत्र पुस्तिका पर वही प्रश्न-पत्र पुस्तिका संख्या अंकित है जो उत्तर पत्रक पर अंकित है । इसमें कोई भिन्नता हो तो वीक्षक से दूसरा प्रश्न-पत्र प्राप्त कर लें । ऐसा न करने पर जिम्मेदारी अभ्यर्थी की होगी ।

The candidate should ensure that Question Paper Booklet No. of the Question Paper Booklet and Answer Sheet must be same after opening the Paper Seal / Polythene bag. In case they are different, a candidate must obtain another Question Paper. Candidate himself shall be responsible for ensuring this.

परीक्षार्थियों के लिए निर्देश

1. सभी प्रश्नों के उत्तर दीजिए ।
2. सभी प्रश्नों के अंक समान हैं ।
3. प्रत्येक प्रश्न का केवल एक ही उत्तर दीजिए ।
4. एक से अधिक उत्तर देने की दशा में प्रश्न के उत्तर को गलत माना जाएगा ।
5. प्रत्येक प्रश्न के चार वैकल्पिक उत्तर दिये गये हैं, जिन्हें क्रमश: 1, 2, 3, 4 अंकित किया गया है । अभ्यर्थी को सही उत्तर निर्दिष्ट करते हुए उनमें से केवल एक गोले अथवा बबल को उत्तर पत्रक पर **नीले बॉल प्वाइंट पेन** से गहरा करना है ।
6. OMR उत्तर पत्रक इस परीक्षा पुस्तिका के अन्दर रखा है । जब आपको परीक्षा पुस्तिका खोलने को कहा जाए, तो उत्तर पत्र निकाल कर ध्यान से केवल **नीले बॉल प्वाइंट पेन** से विवरण भरें ।
7. प्रत्येक गलत उत्तर के लिए प्रश्न अंक का 1/3 भाग काटा जायेगा । गलत उत्तर से तात्पर्य अशुद्ध उत्तर अथवा किसी भी प्रश्न के एक से अधिक उत्तर से है । किसी भी प्रश्न से संबंधित गोले या बबल को खाली छोड़ना गलत उत्तर नहीं माना जायेगा ।
8. मोबाइल फोन अथवा इलेक्ट्रोनिक यंत्र का परीक्षा हॉल में प्रयोग पूर्णतया वर्जित है । यदि किसी अभ्यर्थी के पास ऐसी कोई वर्जित सामग्री मिलती है तो उसके विरुद्ध आयोग द्वारा नियमानुसार कार्यवाही की जायेगी ।
9. कृपया अपना रोल नम्बर ओ.एम.आर. पत्रक पर सावधानीपूर्वक सही भरें । गलत अथवा अपूर्ण रोल नम्बर भरने पर **5 अंक** कुल प्राप्तांकों में से काटे जा सकते हैं ।

चेतावनी : अगर कोई अभ्यर्थी नकल करते पकड़ा जाता है या उसके पास से कोई अनधिकृत सामग्री पाई जाती है, तो उस अभ्यर्थी के विरुद्ध पुलिस में प्राथमिकी दर्ज कराते हुए विविध नियमों-प्रावधानों के तहत कार्यवाही की जाएगी । साथ ही विभाग ऐसे अभ्यर्थी को भविष्य में होने वाली विभाग की समस्त परीक्षाओं से विवर्जित कर सकता है ।

INSTRUCTIONS FOR CANDIDATES

1. Answer all questions.
2. All questions carry equal marks.
3. Only **one** answer is to be given for each question.
4. If more than one answers are marked, it would be treated as wrong answer.
5. Each question has four alternative responses marked serially as **1, 2, 3, 4.** You have to darken only one circle or bubble indicating the correct answer on the Answer Sheet using **BLUE BALL POINT PEN.**
6. The **OMR** Answer Sheet is inside this Test Booklet. When you are directed to open the Test Booklet, take out the Answer Sheet and fill in the particulars carefully with **blue ball point pen only.**
7. **1/3 part of the mark(s) of each question will be deducted for each wrong answer.** A wrong answer means an incorrect answer or more than one answers for any question. Leaving all the relevant circles or bubbles of any question blank will not be considered as wrong answer.
8. Mobile Phone or any other electronic gadget in the examination hall is strictly prohibited. A candidate found with any of such objectionable material with him/her will be strictly dealt as per rules.
9. Please correctly fill your Roll Number in O.M.R. Sheet. **5 Marks** can be deducted for filling wrong or incomplete Roll Number.

Warning : If a candidate is found copying or if any unauthorized material is found in his/her possession, F.I.R. would be lodged against him/her in the Police Station and he/she would liable to be prosecuted. Department may also debar him/her permanently from all future examinations.

इस परीक्षा पुस्तिका को तब तक न खोलें जब तक कहा न जाए ।
Do not open this Test Booklet until you are asked to do so.

1. Which of the following errors can be eliminated by taking the mean of both face observations ?

   (1) Errors due to eccentricity of verniers

   (2) Error due to imperfect adjustment of plate levels

   (3) Error due to imperfect graduation

   (4) Error due to line of collimation not being perpendicular to the horizontal axis

2. Aerial photographs do not represents the true plan of ground because

   (1) Variation in speed of aircraft

   (2) Ground relief

   (3) Tilt displacement

   (4) Image displacement

3. In the spacing of stadia hairs in a stadia diaphragm of a tacheometer is 1.25 mm and the focal length of the object glass is 25 cm, then the multiplying constant of tacheometer is

   (1) 250   (2) 200

   (3) 150   (4) 100

4. True bearing of a line is 10° and the magnetic declination is 1° W, its magnetic bearing is

   (1) 20°   (2) 11°

   (3) 9°   (4) 1°

5. The area of a square plot of land was found to be 204.5 m². According to the scale mentioned in plan, it was also mentioned that the 20-m chain used for measurement for plotting was 0.015 m too long. The actual area of the plot of land is

   (1) 204.2 m²

   (2) 204.34 m²

   (3) 204.65 m²

   (4) 204.8 m²

6. If the viscosity of the pore liquid is halved, the coefficient of permeability of soil will become

   (1) ½ times

   (2) 2 times

   (3) 4 times

   (4) Remains same

7. For a sample of dry cohesionless soil with friction angle ϕ, the failure plane will be inclined to the major principal plane by an angle equal to

   (1) $45° + \phi$ (2) $45° - \phi$

   (3) $45° - \phi/2$ (4) $45° + \phi/2$

8. If the departure of a line is 134.8 m and its bearing is 138°45′ then its latitude is

   (1) −204.4 m   (2) −153.71 m

   (3) +153.71 m   (4) +204.4 m

9. The void ratio 'e' is defined as, when V_v = volume of the voids and V_s = volume of the solids

   (1) $e = \dfrac{V_s}{V_v}$

   (2) $e = \dfrac{V_v}{V_s}$

   (3) $e = \dfrac{V_v - V_s}{V_s}$

   (4) $e = \dfrac{1 - V_v}{V_s}$

10. According to IS classification, the range of silt size particles is

   (1) 0.075 mm to 0.002 mm

   (2) 0.425 mm to 0.075 mm

   (3) 2.0 mm to 0.425 mm

   (4) 4.75 mm to 2.0 mm

11. Terzaghi's one dimensional consolidation theory assumes that

   (1) Unique relationship between the void ratio and effective stress is independent of time

   (2) Unique relationship between the void ratio and effective stress is dependent on time

   (3) There is no assumption regarding relationship between the void ratio and effective stress is independent of time

   (4) None of the above

12. Laboratory vane shear test can also be used to determine

   (1) Shear parameter of silty sand

   (2) Shear parameter of sandy clay

   (3) Liquid limit of silty clay

   (4) Plastic limit of clayey silt

13. In a compaction test if the compacting effort is increased, it will result in

   (1) Increase in maximum dry density and OMC

   (2) Increase in maximum dry density but OMC remains unchanged

   (3) Increase in maximum dry density and decrease in OMC

   (4) No change in dry density but decrease in OMC

14. A soil sample having a void ratio of 1.3, water content of 50% and a specific gravity of 2.60, is a state of

   (1) Partial saturation

   (2) Full saturation

   (3) Over saturation

   (4) Under saturation

15. A sample of sand has the following properties : Moist mass = 625.2 gm, Dry mass = 589.9 gm, Absorption = 1.6%. Determine free moisture content.

   (1) 6%   (2) 4.4%

   (3) 7.6%   (4) 2.2%

16. The relationship between bending moment M, flexural rigidity EI and radius of curvature R is given by

(1) EI = MR

(2) EI = 1/MR

(3) EI = M/R

(4) EI = R/M

17. Prismatic cantilever beam of length L carries a uniformly distributed load throughout its length. If at the free end of the beam, vertical deflection is 18 mm and slope of the deflection curve is 0.02 rad, the length of beam is

(1) 0.8 m

(2) 1.0 m

(3) 1.2 m

(4) 1.5 m

18. The group efficiency of a pile group for closely spaced piles

(1) will always be less than 100%

(2) will always be more than 100%

(3) often greater than 100% for cohesion-less soils

(4) often greater than 100% for cohesive soils

19. Which of the following methods is not used for finding slopes and deflections in a statically determinate beam ?

(1) Dummy load method

(2) Three moment equation method

(3) Moment area method

(4) Conjugate beam method

20. Short column fails primarily by

(1) buckling or excessive lateral bending

(2) crushing without buckling

(3) buckling or crushing

(4) combination of crushing and buckling

21. Resilience of material is given by

(1) resultant stress on critical inclined planes

(2) strain energy per unit volume of material

(3) ratio of direct stress to volumetric strain

(4) ratio of yield stress to the factor of safety

22. Maximum bending moment in a beam occurs where

(1) Shear force is maximum

(2) Shear force is minimum

(3) Shear force changes sign

(4) Deflection is zero

01

23. The horizontal thrust due to rise in temperature in a semi-circular two hinged arch of radius R is proportional

(1) R   (2) R^2

(3) $1/R$ (4) $1/R^2$

24. For determining the force in a member AB of the truss shown in figure by method of section, the section is made to pass through AB, AD and ED and the moments are taken about
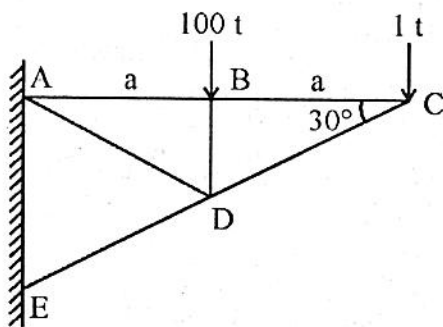
(1) Joint C   (2) Joint B

(3) Joint D   (4) Joint A

25. A sample of a metal is tested in tension, and it is found that there is a strain of 0.0080 at a corresponding stress of 450 N/mm². On the removal of the load a permanent strain of 0.0015 is found to be present. The value of modulus of elasticity for the metal

(1) 1.44×10^5 N/mm²

(2) 1.77×10^5 N/mm²

(3) 0.692×10^5 N/mm²

(4) 0.30×10^5 N/mm²

26. Minimum imposed load considered for sloping roof with slope greater than 10° should not be less than

(1) 1.5 kN/m²
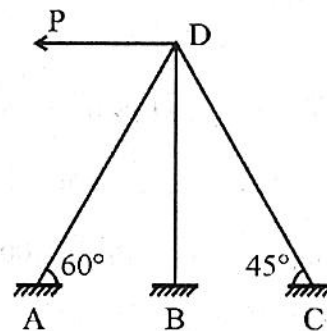
(2) 0.75 kN/m²

(3) 0.40 kN/m²

(4) 0.10 kN/m²

27. The vertical deflection of a gantry girder of span L with manually operated cranes should not exceed

(1) L/250   (2) L/500

(3) L/750   (4) L/1000

28. As per IS 800-2007, elastic modulus of steel is

(1) 1.5×10^9 N/mm²

(2) 2.0×10^5 N/mm²

(3) 2.0×10^6 N/mm²

(4) 1.5×10^5 N/mm²

29. The degree of indeterminacy of the frame fig. is

(1) Zero   (2) One

(3) Two   (4) Three

30. If the thickness of thinnest outside plate is 10 mm, then the maximum pitch of rivets in tension will be taken as

(1) 100 mm   (2) 120 mm

(3) 160 mm   (4) 200 mm

31. The effective length of a fillet weld should not be less than

(1) weld size

(2) two times the weld size

(3) three times the weld size

(4) four times the weld size

32. The thickness t of a single flat lacing should not be less than

(1) $1/30^{th}$ length between inner end rivets

(2) $1/40^{th}$ length between inner end rivets

(3) $1/50^{th}$ length between inner end rivets

(4) None of these ·

33. Indian Railway Board has specified impact factor (CDA) for single track broad gauge bridge for loaded length of span 'L' in meter

(1) $i = 0.15 + \dfrac{8}{(6 + L)} \leq 1.0$

(2) $i = \left(\dfrac{91.5}{91.5 + L}\right) \leq 0.99$

(3) $i = 0.60 \times \left(\dfrac{20}{14 + L}\right) \leq 0.60$

(4) $i = 0.45 \times \left(\dfrac{20}{14 + L}\right) \leq 0.45$

34. For rivets in tension with counter-sunk heads, the tensile value shall be

(1) Reduced by 25%

(2) Reduced by 33.33%

(3) Increased by 25%

(4) Increased by 33.33%

35. Economical depth of a plate girder corresponds to

(1) Minimum weight

(2) Minimum depth

(3) Maximum weight

(4) Minimum thickness of web

36. A steel section is subjected to a combination of shear and bending actions. The applied shear force is V and the shear capacity of the section is V_S. For such a section, high shear force as per IS:800-2007 is defined as

(1) $V > 0.45\ V_S$

(2) $V > 0.60\ V_S$

(3) $V > 0.75\ V_S$

(4) $V > 0.90\ V_S$

37. The pin of a rocker bearing in a bridge is design for

(1) Bearing and Shear

(2) Bending and Shear

(3) Bearing and Bending

(4) Bearing, Shear and Bending

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38. According to IS:456-2000, in the limit state method for design of beams, the limiting values of depth of neutral axis for steels with f_y = 250, 415 and 500 MPa are given by

(1) 0.43d, 0.48d and 0.56d respectively

(2) 0.46d, 0.48d and 0.53d respectively

(3) 0.56d, 0.48d and 0.43d respectively

(4) 0.53d, 0.48d and 0.46d respectively

(where d = effective depth of beam and f_y = yield stress of steel)

39. In the limit state design for flexure, IS:456-2000, assumes that maximum strain in tension reinforcement in the section at failure shall not be less than

(1) $\dfrac{f_y}{E_s} + 0.002$

(2) $\dfrac{f_y}{E_s} - 0.002$

(3) $\dfrac{f_y}{1.15\,E_s} + 0.002$

(4) $\dfrac{f_y}{1.15\,E_s} - 0.002$

(where f_y = characteristics strength of steel, Es = modulus of elasticity of steel)

40. The diameter of longitudinal bars for column should not be less than

(1) 8 mm

(2) 10 mm

(3) 12 mm

(4) 16 mm

41. The basic span to effective depth ratio of a simply supported slab spanning in one direction is

(1) 40   (2) 20

(3) 25   (4) 30

42. The minimum reinforcement using mild steel in slab should not be less than

(1) 0.10%   (2) 0.12%

(3) 0.15%   (4) 0.20%

43. For a pretensioned rectangular plank of length L, the uplift at centre on release of wires from anchorages due to pretensioning only will be

(1) $PL^2e/8EI$

(2) $PL^2e/10EI$

(3) $PL^2e/12EI$

(4) $PL^2e/16EI$

(where P = force, e = constant eccentricity and EI = flexural rigidity)

44. A beam curved in plan is designed for

(1) Bending moment and shear

(2) Bending moment and torsion

(3) Shear and torsion

(4) Bending moment, shear and torsion

45. In a prestressed member it is advisable to use

(1) High strength concrete only

(2) High strength concrete & high tensile steel

(3) Low strength concrete but high tensile steel

(4) High strength concrete but low tensile steel

46. If a beam fails in bond, then its bond strength can be increased most economically by

(1) Increasing the depth of beam

(2) Using thinner bars but more in number

(3) Using thicker bars but less in number

(4) Providing vertical stirrups

47. As per IS:456-2000, the flexural tensile strength of M-25 grade of concrete is

(1) 7.5 MPa   (2) 5.5 MPa

(3) 4.5 MPa   (4) 3.5 MPa

48. As per IS:456-2000, the minimum eccentricity for design of column should be

(1) $\dfrac{L}{300} + \dfrac{D}{50}$

(2) $\dfrac{L}{30} + \dfrac{D}{500}$

(3) $\dfrac{L}{500} + \dfrac{D}{30}$

(4) $\dfrac{L}{50} + \dfrac{D}{300}$

Subjected to a minimum of 20 mm (where L = unsupported length of column and D = lateral dimension)

49. The shape of the recession limb of a hydrograph depends upon

(1) Storm characteristics only

(2) Basin characteristics only

(3) Both (1) and (2)

(4) None of these

50. The side face reinforcement, if required in a T-beam will be

(1) 0.1% of the web area

(2) 0.15% of the web area

(3) 0.2% to 0.3% of the web area depending upon the breadth of the web

(4) Half the longitudinal reinforcement

■

51. The water hammer is caused due to

(1) Sudden closure of a valve

(2) Sudden opening of a valve

(3) Compressibility of water

(4) None of these

52. The ratio of quantity of water stored in the roots of the crops to the quantity of water actually applied in the field is known as

(1) water use efficiency

(2) water conveyance efficiency

(3) water application efficiency

(4) water distribution efficiency

53. The unit hydrograph due to a storm may be obtained by dividing the ordinates of the direct runoff hydrograph by

(1) direct runoff volume

(2) total rainfall

(3) rainfall intensity

(4) period of storm

54. For a flood control reservoir, the effective storage is equal to

(1) Useful storage – valley storage

(2) Useful storage + surcharge storage – valley storage

(3) Useful storage + surcharge storage

(4) Useful storage + surcharge storage + valley storage

55. A hydraulic turbine rotates at 'N' rpm operating under a net head 'H' and discharge 'Q' while developing an output power 'P'. The specific speed is given as

(1) $\dfrac{N\sqrt{Q}}{H^{5/4}}$

(2) $\dfrac{N\sqrt{P}}{H^{3/4}}$

(3) $\dfrac{N\sqrt{P}}{H^{5/4}}$

(4) $\dfrac{N\sqrt{Q}}{H^{3/4}}$

56. An open cubical tank was initially filled with water. When the tank was accelerated on a horizontal plane along one of its side, it was found that one-fourth of the volume of water spilled out. The acceleration was

(1) g   (2) g/2

(3) g/3   (4) 2g/3

57. The discharge over a triangular notch having angle 2θ is

(1) $\dfrac{8}{15} C_d \tan\theta \sqrt{2g}\ H^{2/5}$

(2) $\dfrac{8}{15} C_d \tan\theta \sqrt{2g}\ H^{5/2}$

(3) $\dfrac{15}{8} C_d \tan\theta \sqrt{2g}\ H^{5/2}$

(4) $\dfrac{15}{8} C_d \tan\theta \sqrt{2g}\ H^{2/5}$

58. An open circular cylindrical tank is filled with a liquid to its top level. It is rotated about its vertical axis at such a speed that half the liquid spills out. Then the pressure at the point of intersection of the axis and the bottom is

(1) One-fourth the value when the cylinder was full

(2) One-half the value when the cylinder was full

(3) Same as before rotation

(4) Equal to the atmospheric pressure

59. Eutrophication of water bodies occur due to excess washing of following fertilizer chemicals into water bodies along with runoff water

(1) Nitrogen and phosphorus

(2) Nitrogen and potassium

(3) Phosphorus and potassium

(4) Calcium and potassium

60. Choose the false statement

(1) Critical flow prevails when the Froude's number has a unit value.

(2) The depth of water at which the specific energy is maximum is called the critical depth.

(3) Conditions for maximum discharge and minimum specific energy are identical.

(4) For every value of specific energy other than the minimum, there are two possible depths of flow.

61. If treated water to be supplied is available at higher level than the distribution area, which water distribution system may be adopted ?

(1) Gravity system

(2) Pumping system

(3) Combined gravity and pumping system

(4) Intermittent system

62. Activated carbon is used in water treatment for

(1) disinfection

(2) removing hardness

(3) removing odour

(4) aeration

63. The population of a city at previous consecutive years was 400000, 520000, 680000 and 880000. Using arithmetic increase method, the anticipated population at the next census would be

(1) 1000000

(2) 1020000

(3) 1040000

(4) 1060000

64. The suitable layout of a water distribution system for irregularly growing city is

(1) grid iron system

(2) ring system

(3) radial system

(4) dead end system

65. For treating the sewage of a large city, you will recommend

(1) A sedimentation tank and an activated sludge treatment plant

(2) A plant consisting of Imhoff tanks with low rate trickling filter

(3) Sedimentation tanks with high rate trickling filter

(4) None of these

66. The uniformity coefficient (D_{60}/D_{10}) for the sand used in slow sand filters should be

(1) 6 to 7

(2) 3 to 5

(3) 1.5 to 3

(4) 1 to 1.5

67. Select the primary air pollutants among the following

(1) Sulphur dioxide and nitrogen oxides

(2) Ozone and carbon monoxide

(3) Sulphur dioxide and ozone

(4) Nitrogen oxide and ozone

68. In a water treatment plant, dissolved iron and manganese can be removed from the water by

(1) Aeration

(2) Aeration and coagulation

(3) Aeration and filtration

(4) Aeration and sedimentation

69. Mud pumping is associated with

(1) Bituminous concrete pavement on granular subgrade

(2) Cement concrete pavement on granular subgrade

(3) Bituminous concrete pavement on clayey subgrade

(4) Cement concrete pavement on clayey subgrade

70. Orthotolidine test is used for determination of

(1) Dissolved oxygen

(2) Residual chlorine

(3) Biochemical oxygen demand

(4) Dose of coagulant

71. The super-elevation needed on a horizontal circular curve of 120 m radius for full design speed of 60 kmph with 0.15 as coefficient of friction, is

(1) 7.5%

(2) 8.6%

(3) 9.2%

(4) 10.1%

72. The width of carriageway for two lane, with raised kerbs, standardised by Indian Road Congress is given by

(1) 7.5 m

(2) 7.0 m

(3) 5.5 m

(4) 6.0 m

73. The modulus of subgrade reaction is obtained from load-deformation curve corresponding to the settlement of

(1) 0.125 cm

(2) 0.25 cm

(3) 0.375 cm

(4) 0.5 cm

74. The road roughness is measured by

(1) Bump integrator

(2) Overlay vehicle

(3) Motor grader

(4) Forklift truck

75. The most inconvenient method for parking is

(1) 30 degree parking

(2) 45 degree parking

(3) 90 degree parking

(4) Parallel parking

76. The design of horizontal and vertical alignments, super-elevation is worst affected by

(1) Length of vehicle

(2) Width of vehicle

(3) Speed of vehicle

(4) Height of vehicle

77. A vehicle has a wheel base of 6 m, what is the off tracking while negotiating a curved path with a mean radius 30 m ?

(1) 0.2 m

(2) 1.66 m

(3) 0.4 m

(4) 0.6 m

78. No warping stress in pavements is developed if temperature

(1) Constant

(2) Less than normal

(3) More than normal

(4) Changes frequently

79. The rate of deterioration in the flexible pavement is

(1) Linear

(2) Parabolic

(3) Exponential

(4) Cubical

80. The optimistic time, the most likely time and the pessimistic time estimates in a network are 4, 6 and 14 months. The expected time is

(1) 7 months

(2) 8 months

(3) 9 months

(4) 10 months

81. Expressways should be constructed along

(1) Congested cities

(2) Major traffic corridors

(3) Along with highways

(4) Small cities

82. First party audit for project is conducted by

(1) customers of the organization

(2) organization itself

(3) external independent organization

(4) customers & organization

83. Indirect cost of project is

(1) project overheads + labour cost + equipment cost

(2) labour cost + sub-contractors cost

(3) common workmen cost + contingency

(4) project overheads + common workmen cost

84. The difference between the time available to do a job and the time required to do the job, is known as

(1) Event

(2) Float

(3) Duration

(4) Constraint

85. The balance sheet is

(1) a summary of what company owns and what the company owes

(2) the evaluation of effective cash flow characteristics of a project

(3) the cost for mobilization and demobilization of personnel, equipment, temporary facilities & other facilities

(4) performing cost optimization

86. The texture of sand stone is

   (1) Porphyritic

   (2) Conglomerate

   (3) Vesicular

   (4) Clastic

87. Radial splits in timber originating from bark and narrowing towards the pith · are known as

   (1) Heart shakes

   (2) Star shakes

   (3) Cup shakes

   (4) Knots

88. In portland cement Calcium choloride ($CaCl_2$) is most widely used for

   (1) reducing curing time.

   (2) increasing strength.

   (3) improving consistency.

   (4) reducing initial and final set times.

89. Dormer window is defined as

   (1) Windows provided in dormitories

   (2) Vertical window built in sloping side of a pitched roof

   (3) Window provided in the gable end of a pitched roof

   (4) Sloping window provided along the slope of a pitched roof

90. Which type of foundation is used for the construction of school building on black cotton soil ?

   (1) Well foundation

   (2) Stepped foundation

   (3) Mat foundation

   (4) Cantilever foundation

91. In stone masonry, stones are so placed that the direction of pressure is

   (1) Inclined to natural bed at 30°

   (2) Inclined to natural bed at 45°

   (3) Parallel to the natural bed

   (4) Perpendicular to the natural bed

92. Dolomite bricks are

   (1) Acid refractory bricks

   (2) Basic refractory bricks

   (3) Neutral refractory bricks

   (4) Ordinary bricks

93. In crushing test on coarse aggregates, what size particle is used for sample ?

   (1) Passing 12.5 mm IS sieve

   (2) Retained on 10 mm IS sieve

   (3) Passing 10 mm and retained on 4.75 mm IS sieve

   (4) Passing 12.5 mm and retained on 10 mm IS sieve

94. For construction of structure under water, the lime used is

(1) Pure lime

(2) Quick lime

(3) Fat lime

(4) Hydraulic lime

95. When a theodolite is in proper adjustment, which of the following conditions between fundamental lines are satisfied ?

(a) Axis of the plate level is perpendicular to the vertical axis

(b) The line of collimation is at right angles to the line of sight

(c) The axis of the altitude level is parallel to the line of collimation when it is horizontal and the vertical circle reads zero

Select the correct answer using the codes given below :

Codes :

(1) (a) and (b)

(2) (b) and (c)

(3) (a) and (c)

(4) (a), (b) and (c)

96. White cement should have least percentage of

(1) Aluminium oxide

(2) Iron oxide

(3) Silica

(4) Sodium oxide

97. The length of a chain is measured from

(1) Centre of one handle to centre of the other handle

(2) Outside of one handle to outside of the other handle

(3) Inside of one handle to inside of the other handle

(4) Outside of one handle to centre of the other handle

98. In triangulation, the best shape of the triangle should be

(1) Equilateral triangle

(2) Right angled isosceles triangle

(3) Isosceles triangle with two base angles of 56° 14′ each

(4) Isosceles triangle with two base angles of 65° 14′ each

99. The downhill end of a 30 m tape is held 80 cm too low. What is the horizontal distance measured ?

(1) 29.2 m   (2) 29.9733 m

(3) 29.9893 m   (4) 29.9866 m

100. The R.L. of the point A, which is on the floor, is 100 m and back-sight reading on A is 2.565 m. If the foresight reading on the point B which is on the ceiling with inverted staff is 2.445 m. The R.L. of the point B will be

(1) 97.435 m   (2) 100.120 m

(3) 102.445 m   (4) 105.010 m