Sl. No. : 10017377

CVE08

Register Number

2014
CIVIL ENGINEERING
(Degree Standard)

Time Allowed : 3 Hours] **[Maximum Marks : 300**

Read the following instructions carefully before you begin to answer the questions.

IMPORTANT INSTRUCTIONS

1. This Booklet has a cover (this page) which should not be opened till the invigilator gives signal to open it at the commencement of the examination. As soon as the signal is received you should tear the right side of the booklet cover carefully to open the booklet. Then proceed to answer the questions.
2. This Question Booklet contains **200** questions. Prior to attempting to answer the candidates are requested to check whether all the questions are there and ensure there are no blank pages in the question booklet. In case any defect in the Question Paper is noticed it shall be reported to the Invigilator within first 10 minutes.
3. Answer **all** questions. **All** questions carry equal marks.
4. You must write your Register Number in the space provided on the top right side of this page. Do not write anything else on the Question Booklet.
5. You will also encode your Register Number, Subject Code, Question Booklet Sl. No. etc. with Blue or Black ink Ball point pen in the space provided on the side 2 of the Answer Sheet. If you do not encode properly or fail to encode the above information, your Answer Sheet will not be evaluated.
6. Each question comprises *four* responses (A), (B), (C) and (D). You are to select ONLY ONE correct response and mark in your Answer Sheet. In case you feel that there are more than one correct response, mark the response which you consider the best. In any case, choose ONLY ONE response for each question. Your total marks will depend on the number of correct responses marked by you in the Answer Sheet.
7. In the Answer Sheet there are **four** circles Ⓐ, Ⓑ, Ⓒ and Ⓓ against each question. To answer the questions you are to mark with Ball point pen ONLY ONE circle of your choice for each question. Select one response for each question in the Question Booklet and mark in the Answer Sheet. If you mark more than one answer for one question, the answer will be treated as wrong. *e.g.* If for any item, Ⓑ is the correct answer, you have to mark as follows :

   Ⓐ ● Ⓒ Ⓓ

8. You should not remove or tear off any sheet from this Question Booklet. You are not allowed to take this Question Booklet and the Answer Sheet out of the Examination Hall during the examination. After the examination is concluded, you must hand over your Answer Sheet to the Invigilator. You are allowed to take the Question Booklet with you only after the Examination is over.
9. The sheet before the last page of the Question Booklet can be used for Rough Work.
10. Failure to comply with any of the above instructions will render you liable to such action or penalty as the Commission may decide at their discretion.
11. Do not tick-mark or mark the answers in the Question booklet.

SEAL

1. Match List-I with List-II

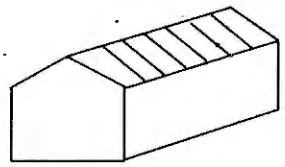
	List I (Type of cement)		List II (Compound in cement clinker)
(a)	high early strength of cement	1.	C_3A
(b)	initial setting time of cement	2.	C_2S
(c)	strength of cement at later age	3.	C_3S

	(a)	(b)	(c)
(A)	1	2	3
(B)	2	1	3
(C)	3	2	1
(D)	3	1	2

2. Flooring material that is supplied in the form of rolls

(A) Glass (B) Cork (C) Linoleum (D) Mosaic

3. The type of roof shown in figure is

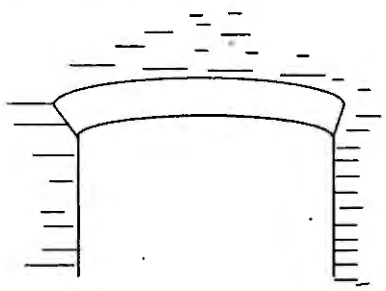


(A) Lean to roof (B) Gambrel roof (C) Gable roof (D) Deck roof

4. The exposed edges of stones are bevelled for a depth of 2.5 cm in a

(A) Ashlar rough tooled masonry (B) Ashlar rock faced masonry
(C) Ashlar changed masonry (D) Ashlar block in course

5. The arch indicated in the figure below is a



(A) Semicircular arch (B) Segmental arch
(C) Horse-Shoe arch (D) Stilted arch

6. The difference between the true value of a quantity and its observed value is

(A) most probable value
(B) true value
(C) true error
(D) most probable error

7. One of the following set of terms are related to curve setting in road network placing

(A) parabola, hyperbola, circle
(B) angle, chord, centre line
(C) apex distance, unit chord and tangent length
(D) cant, bitumen, tangent length

8. Mapping of spot heights in a terrain with (x, y) observation is possible with

(A) Total station
(B) EDM
(C) Photogrammetry
(D) Electronic theodolite

9. The substance bar has two vases for measurement of

(A) one inclinded angle
(B) one sighting
(C) two linear observation
(D) two vertical angles

10. The condition necessary for accurate assessment of vertical angles using theodolite is achieved through adjustment of

(A) plate bubbles
(B) tightening screws
(C) cross hair in diaphragm
(D) trunmois axis

11. Super elevation on a curved road cannot be provided at

(A) forward tangent
(B) point of equilibrium
(C) point of tangent
(D) point of reverse curvature

12. The allowable linear error of closure for minor theodolite traverse for detailing is

(A) 1:5,000 (B) 1:300 (C) 1:50 (D) 1:10,000

13. To measure the magnetic bearing of a line, the theodolite should have

(A) tape
(B) trough compass
(C) magnetic compass
(D) total station

14. In general engineering survey terminology, LS and CS survey means (w.r.t. leveling)

(A) long staff and cross staff survey
(B) longitudinal section and cross section surveying
(C) line of sight and cross sight
(D) leveling survey and contour survey

15. The maximum shear stress theory gives better results for

(A) brittle materials (B) ductile materials

(C) brittle and ductile materials (D) non-metallic materials

16. Moment area method is used for determining the

(A) shear force at a point (B) bending at a point

(C) deflection at a point (D) slope and deflection at a point

17. The strain energy due to sending is given by (where M-bending moment l-length of member, E-Young's modulus and I-moment of inertia)

(A) $\int_0^l \frac{M^2}{2EI}dx$ (B) $2\int_0^{l/2} \frac{M^2}{EI}dx$ (C) $\int_0^l \frac{M}{2EI}dx$ (D) $\int_0^l \frac{M}{EI}dx$

18. The maximum principal stress theory is also known as

(A) St. Vernant's theory (B) Beltrami's theory

(C) Von Mises theory (D) Rankine's theory

19. The maximum slope of a simply supported beam of length L carrying a uniformly distributed load of w per unit length is

(A) $wL^3/6EI$ (B) $wL^3/16EI$ (C) $wL^3/24EI$ (D) $wL^3/48EI$

20. The relation between, E, G and K is where E-Young's modulus, G-rigidity modulus, K-bulk modulus

(A) $E = \frac{G+3K}{3GK}$ (B) $E = \frac{3G+K}{9GK}$ (C) $E = \frac{G+3K}{9GK}$ (D) $E = \frac{9GK}{G+3K}$

21. The major and minor principal stress are σ_1 and σ_2, maximum shear stress is given as

(A) $\frac{\sigma_1+\sigma_2}{2}$ (B) $\frac{\sigma_1^2+\sigma_2^2}{2}$ (C) $\frac{\sigma_1-\sigma_2}{2}$ (D) $\left(\frac{\sigma_1-\sigma_2}{2}\right)^2$

22. Materials are generally classified as brittle if the percentage of elongation is less than

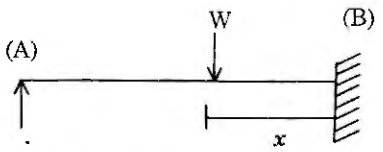
(A) 5% (B) 15% (C) 25% (D) 40%

23. Principal planes are separated by

(A) 180° (B) 45° (C) 90° (D) 60°

24. Consider the following statements.

In the beam shown in Fig. for all positions of load W (except $x = 0$)



1. bending moment is maximum at B
2. bending moment is maximum under load
3. deflection is zero at A
4. deflection is zero at B

Of these statements :

(A) 1 and 3 are correct
(B) 2 and 4 are correct
(C) 1 and 4 are correct
(D) 1, 3 and 4 are correct

25. In a spherical dome the hoop stress due to a concentrated load at crown is

(A) compressive everywhere
(B) tensile everywhere
(C) zero
(D) partly compressive and partly tensile

26. Consider the following statements.

I. In a two hinged semi-circular, the reaction locus is a straight line.

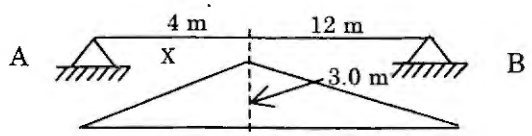
II. The distance of reaction locus from abutment is $\pi R/2$.

(A) Both I and II are true
(B) I is true but II is false
(C) I is false but II is true
(D) Both I and II are false

27. Euler buckling load can only represent column behaviour

(A) of higher values of slenderness ratio
(B) of lower values of slenderness ratio
(C) both high value and lower values of slenderness ratio
(D) is not based on slenderness ratio

28. The influence line for bending moment at section $X(M_x)$ at a distance of 4 m from the left support of simply supported girder AB is shown in Fig. A udl of intensity $2t/m$ longer than the span crosses the girder from left to right. The maximum bending moment at section X is equal to



(A) 12 t-m
(B) 24 t-m
(C) 48 t-m
(D) 96 t-m

29. The line of optimum generally corresponds to percentage air voids of about

(A) zero percent
(B) 5 percent
(C) 10 percent
(D) 20 percent

30. If c, γ and H_c are cohesion, unit weight of soil and critical height of slope, the stability number is given by

(A) $\frac{c}{\gamma H_c}$ (B) $\frac{H_c}{c\gamma}$ (C) $\frac{\gamma H_c}{c}$ (D) $\frac{c\gamma}{H_c}$

31. The following assumption is not made for the friction circle method of slope stability analysis

(A) friction is fully mobilised
(B) total stress analysis is applicable
(C) the resultant is tangential to the friction circle
(D) the resultant passes through the centre of friction circle

32. The pile designed to take care of uplift levels are called

(A) compression pile
(B) anchor pile
(C) end bearing pile
(D) screw pile

33. Pile cap in group pile is a

(A) structural member
(B) connecting member of pile
(C) member to transfer the column load uniformly for all piles
(D) member to reduce settlement of pile group

34. Two circular footing of diameters D_1 and D_2 are resting on the surface of the same purely cohesive soil. The ratio of their gross ultimate bearing capacities is

(A) $\frac{D_1}{D_2}$ (B) $\frac{D_2}{D_1}$ (C) 1.0 (D) $\left(\frac{D_1}{D_2}\right)^2$

35. The coefficient of subgrade reaction depends upon

(A) the size of footing
(B) the size, shape of footing
(C) the depth of footing
(D) the size, shape and depth of footing

36. Match the following pairs.

A	B
(a) Residual chlorine	1. Orthotolidine
(b) COD	2. Ferro in solution
(c) Chlorides	3. Potassium chromate
(d) Hardness	4. Eriochrome black T

	(a)	(b)	(c)	(d)
(A)	1	2	3	4
(B)	2	3	4	1
(C)	4	1	2	3
(D)	3	4	2	1

37. There are three samples X, Y and Z of water having pH value of 4.5, 5.5 and 6.5 respectively. Calculate how many times X is acidic than Z?

(A) 2 times
(B) 4 times
(C) 10 times
(D) 100 times

38. Air binding phenomena in rapid sand filters occur due to

(A) excessive negative head
(B) mud ball formation
(C) higher turbidity in the effluent
(D) low temperature

39. Which one of the following is the purpose of providing a surge tank in a pipeline carrying water?

(A) to store water
(B) to increase the pressure throughout the pipeline
(C) to store overflowing water
(D) to protect the pipeline against water hammer

40. As compared to the geometrical increase method of forecasting population, the arithmetical increase method gives

(A) lesser value
(B) higher value
(C) equal value
(D) may vary as it may depend on the population figures

41. Pyrolysis is suitable for

(A) inorganic material
(B) organic materials
(C) metal scraps
(D) radioactive wastes

42. Parshall flume is provided to control velocity of flow in

(A) trickling filter
(B) grit chamber
(C) activated sludge
(D) slow sand filter

43. As a result of a stabilization of sewage effluent, the most appropriate end product

(A) chloride
(B) plant nutrients
(C) alkalinity
(D) hardness

44. BOD exerted of waste water ———— with time, while BOD remaining ———— with time.

(A) decrease, decrease
(B) increase, decrease
(C) decrease, increase
(D) increase, increase

45. The population equivalent factor for BOD is

(A) 0.08 kg of BOD_5/day/person
(B) 0.06 kg of BOD_5/day/person
(C) 0.8 kg of BOD_5/day/person
(D) 0.6 kg of BOD_5/day/person

46. External heating devices are sometimes provided to control temperature in

(A) trickling filter
(B) activated sludge process
(C) sludge digestion tank
(D) oxidation ditch

47. The colour of sewage changes from Grey to dark indicates

(A) presence of oxygen and aerobic condition
(B) zero dissolved oxygen and anaerobic condition
(C) low strength sewage and aerobic condition
(D) fresh sewage with dissolved oxygen

48. In the design of storm sewers, 'Time of concentration' is relevant to determine the

(A) rainfall intensity
(B) velocity in the sewer
(C) time of travel
(D) area served by the sewer

49. The accuracy of the predicted strength of concrete using rebound hammer test is

(A) ± 5 percentage
(B) ± 10 percentage
(C) ± 25 percentage
(D) ± 35 percentage

50. An ultrasonic pulse is generated by

(A) an amplifier
(B) a pair of transducers
(C) an electronic timing device
(D) an electro – acoustical transducer

51. Anchorage value of standard 90° bend will be

(A) 8 times the diameter of the bar with a maximum of 16 times the diameter of the bar
(B) 16 times the diameter of the bar
(C) 4 times the diameter of the bar for each 45° bend, which should not exceed 16 times the diameter of the bar
(D) 4 times the diameter of the bar

52. If the depth of neutral axis is x_u, the depth of the rectangular portion of the stress block will be

(A) $0.416\ x_u$
(B) $0.43\ x_u$
(C) $0.57\ x_u$
(D) $0.62\ x_u$

53. The model adopted for shear reinforcement design by median standard code is

(A) compression force-path
(B) 45° truss
(C) modified compression field
(D) variable angle truss

54. Which of the following options gives the partial safety factors for dead load and wind load for limit state of collapse when stability against overloading is critical?

(A) 1.5 DL + 1.5 WL
(B) 1.2 DL + 1.2 WL
(C) 0.9 DL + 1.5 WL
(D) 1.4 DL + 1.6 WL

55. Consider the following statements.

Assertion (A) : To avoid brittle failures, an upper limit on τ_c is imposed by the codes

Reason (R) : Large shear forces in the beam will result in compressive stresses that may cause crushing of web concrete

(A) Both (A) and (R) are true, and (R) is the correct explanation of (A)
(B) Both (A) and (R) are true, but (R) is not the correct explanation of (A)
(C) (A) is true, but (R) is false
(D) (A) is false, but (R) is true

56. The most efficient and economical section used as a beam is

(A) I section (B) Circular section

(C) Angle section (D) H section

57. The maximum moment considered in a continuous purlin subjected to uniformly distributed load of intensity 'w' and distance between supports 'l' is

(A) $\frac{wl^2}{8}$ (B) $\frac{wl^2}{10}$ (C) $\frac{wl^2}{12}$ (D) $\frac{wl^2}{16}$

58. In designing prestressed concrete flexural members, the breadth of compression flange is determined on the basis of

(A) ultimate shear strength (B) ultimate flexural strength

(C) ultimate tensile strength (D) ultimate compressive strength

59. The compression member used in roof trusses and bracings are called as

(A) Rafters (B) Booms (C) Struts (D) Knee braces

60. The effective length of the fillet weld is

(A) Total length minus twice the throat size

(B) Total length minus twice the weld size

(C) 0.7 times total length

(D) Total length minus 0.7 times the weld size

61. The theoretical load carrying capacity of a long column with hinged ends is 100 kN. The load carrying capacity of the same column if its ends are fixed is

(A) 50 kN (B) 70 kN (C) 200 kN (D) 400 kN

62. Consider the following statements.

Assertion (A) : The engineering stress-strain curve does not give a true indication of the deformation characteristics of a metal in tension

Reason (R) : The engineering stress-strain curve of a metal in tension is based entirely on the original dimensions of the specimen and these dimensions change continuously as the load increases

(A) Both (A) and (R) are true, and (R) is the correct explanation of (A)

(B) Both (A) and (R) are true, but (R) is not a correct explanation of (A)

(C) (A) is true, but (R) is false

(D) (A) is false, but (R) is true

63. Unit hydrograph theory was first enunciated by

(A) Clark (B) Sherman (C) Nash (D) Bernard

64. Base period of a crop is the time between

(A) the instant of sowing to its harvesting

(B) first watering at the time of sowing to its last watering before harvesting

(C) sowing to last watering

(D) none of the above

65. A land is considered prone to water logging when water table is

(A) within 1.5 m of ground surface (B) within 2 m of ground surface

(C) within 3 m of ground surface (D) within 3.5 m of ground surface

66. The Exchangeable Sodium Percentage (ESP) of a saline soil is

(A) >15 (B) 15 (C) none of them (D) <15

67. In a Syphon-aqueduct, the most severe condition of uplift on the floor occurs when

(A) Canal runs full and drain is dry

(B) Canal is dry and drain is with high flood level

(C) Canal runs dry and drain is dry

(D) Both canal and drain run full

68. Irrigation potential of the country is about

(A) 87 M. ha (B) 100 M. ha (C) 113 M. ha (D) 125 M. ha

69. The optimum capacity of an irrigation tube well is

(A) 0.07 cumec (B) 0.08 cumec (C) 0.05 cumec (D) 0.10 cumec

70. The fall when flumed functioning satisfactorily as a meter is

(A) Sharp crested fall (B) Vertical fall

(C) Inglis fall (D) Broad crested weir

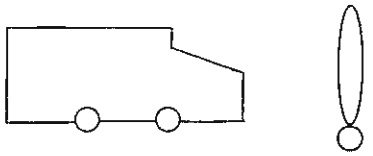
71. The co-efficient of Rugosity (N_a) for an earthen canal in excellant condition is

(A) 0.015 (B) 0.020 (C) 0.025 (D) 0.030

72. The water application efficiency of sprinkler irrigation method in moderate climate is

(A) 70% (B) 60% (C) 80% (D) 90%

73. The below figure indicates



(A) Informatory sign
(B) Regulatory sign
(C) Warning sign
(D) Route marker sign

74. Highway capacity is defined as the total number of vehicles
(A) that can pass a given point in a unit period of time
(B) that can pass a given point in a specified period of time
(C) that can be accommodated on a unit length of the road
(D) that can pass a given length of the road in km

75. As per Indian Roads Congress (IRC), traffic volume study is carried out for rural roads continuously during harvesting and urn season for
(A) 14 days (B) 28 days (C) 7 days (D) 21 days

76. The overall road density in the country should be increased to 82 km per 100 sq.km area by the year 2001 according to
(A) First twenty year road plan
(B) Second twenty year road plan
(C) Third twenty year road plan
(D) Fourth twenty year road plan

77. Arterial road come under category of which road
(A) Secondary rural
(B) Rural
(C) Urban
(D) Primary rural

78. If the stopping sight distance for a highway is 91.4 m, then its intermediate Sight Distance is
(A) 91.4 m (B) 182.8 m (C) 45.7 m (D) 274.2 m

79. If 'V' is the design speed of a overtaking vehicle, then speed of overtaken vehicle if not given shall be assumed as
(A) (V–13) kmph (B) (V–14) kmph (C) (V–15) kmph (D) (V–16) kmph

80. If the cross slope of a particular terrain is 15%, then it is classified as
(A) Plain (B) Rolling (C) Mountainous (D) Steep

81. Garbage dumping is not allowed around the areas closer to airport for the reason

(A) To avoid ugly views for passengers while entering the city

(B) To avoid foul smell affecting passengers waiting in terminals.

(C) To avoid rats and such menace to airport buildings that may come from garbage area

(D) To avoid BIRD menace – birds hitting the planes during takeoff and landing

82. The periodic rise and fall of sea water levels based on the influence of moon on earth is called as

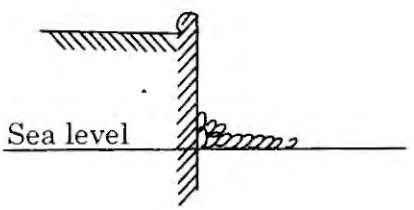
(A) Wave

(B) Tide

(C) Current

(D) Tsunami

83. The figure below illustrates the type of vertical wall adopted in



(A) Britain beach

(B) Scandinavia beach

(C) Miami beach

(D) U.S.A. beach

84. The part of an airport where planes are parked for repairs, maintenance, etc is called as

(A) Apron

(B) ATC

(C) Hangar

(D) Taxiway

85. When rails are welded, there is no need for expansion joint. Still the deformations of rails due to thermal stresses are avoided by.

(A) Locking effect on longitudinal thermal stresses due to resistance by sleepers, ballest, etc

(B) Welds absorb the thermal stresses

(C) Thermal stresses are lesser than the weld stress

(D) Thermal stresses are negligible compared to stresses from high speed trains

86. The Poisson's ratio is defined as

(A) Linear strain/Lateral strain

(B) Lateral strain/Linear strain

(C) Shear strain/Linear strain

(D) Linear strain/Shear strain

87. If the earliest finish time of activity is 18 days and its duration is 8 days, then its earliest start is

(A) 8 (B) 10

(C) 18 (D) 26

88. In PERT technique the critical path has slack equal to

(A) Zero or Positive (B) Negative

(C) Positive (D) Zero or Negative

89. When the float of an activity is positive then it is called as

(A) Super critical activity

(B) Critical activity

(C) Sub-critical activity

(D) Hyper-critical activity

90. Which one of the following is not an application of CPM?

(A) Crashing

(B) Resource levelling

(C) Resource allocation

(D) Linear scheduling

91. What key hardware item ties a CAD/CAM system together?

(A) Keyboard
(B) Graphics workstation
(C) Digitiser
(D) Plotter

92. The 'snap' command feature in both Auto CAD and versa CAD ensures that :

(A) template lines can be removed
(B) objects are entered at specific intervals
(C) definable center markers are entered
(D) identified data are automatically segmented

93. A technique for displaying applications where complex 3-D geometrics are required for the exterior shall of a product is called

(A) 2 – D modelling
(B) Solid modelling
(C) 3 – D modelling
(D) Surface modelling

94. What is the name of the system database that contains description of the data in the database?

(A) Metadata
(B) Data dictionary
(C) Table
(D) Name space

95. The method of solid modeling that defines the topology of faces, edges and vertices as well as data that defines the surface in which each face line is called

(A) Layering
(B) Constructive solid geometry
(C) Boundary representation
(D) Isometric

96. A means of storing large amounts of data outside the main memory is

(A) Magnetic memory
(B) Primary memory
(C) Auxiliary memory
(D) Cache memory

97. Increase in fineness of cement

(A) reduces the rate of strength development and leads to higher shrinkage

(B) increases the rate of strength development and reduces the rate of deterioration

(C) decreases the rate of strength development and increases the bleeding of cement

(D) increases the rate of strength development and leads to higher shrinkage

98. Moh's scale for stones is used to determine

(A) toughness (B) hardness (C) durability (D) specific gravity

99. Before testing setting time of cement one should test for

(A) soundness (B) strength

(C) fineness (D) consistency

100. Which of the following is used for making electrical switches?

(A) polyvinyl chloride (B) polypropylene

(C) bakelite (D) polyvinyl acetate

101. Trade name of polystryene is

(A) Thermocol (B) Asbestos

(C) Cork (D) Glass wool

102. Marble is quarried by

(A) heating (B) excavating

(C) wedging (D) blasting

103. Consider the following statements.

Assertion (A) : Finer the cement, more is the strength.

Reason (R) : Surface area for hydration is less for finer cements

(A) Both (A) and (R) are true and (R) is the correct explanation of (A)

(B) Both (A) and (R) are true, but (R) is not a correct explanation of (A)

(C) (A) is true, but (R) is false

(D) (A) is false, but (R) is true

104. The process of adding water to lime to convert it into hydrated lime is known as

(A) quenching (B) crystallisation (C) slaking (D) calcination

105. The specific gravity of most of the stones lie between

(A) 1.8 to 2.2 (B) 2.5 to 3.0 (C) 3.0 to 3.5 (D) 3.5 to 4.5

106. A sloping member which supports the steps in a stair

(A) Stringer (B) Carriage (C) Flight (D) Landing

107. Out of all the rules and specifications, choose the most important requirement with respect to brick masonry

(A) all bricks should be of uniform shape and size

(B) the mortal joints should be as thin as possible

(C) the vertical joints should not be contiguous and should be staggered in consecutive layers

(D) the entire wall height should be constructed without stoppage in between

108. Masons who went to ensure the best quality and best workmanship in brick masonry, will insist on using only

(A) single layer scaffolding with crea supports on the wall itself

(B) double layer scaffolding which does not require the wall for its support

(C) steel scaffolding instead of timber scaffold

(D) moving scaffold

109. A type of scaffolding that can be provided on side of a busy street without obstructing the traffic on road

(A) Single scaffolding (B) Mason's scaffolding

(C) Ladder scaffolding (D) Needle scaffolding

110. A semi tight material which forms an excellent impervious layer for damp-proofing is called

(A) bitumen (B) bituminous felt (C) aluminal (D) mastic asphalt

111. In Arches, the bottom most starting point at both ends is called as

(A) Springer (B) Crown (C) Closer (D) Bearing

112. SIMPSON'S rule to calculate area-to apply this rule, then the condition to divide the given overall area is that

(A) no special condition, the whole area can be divided any way

(B) divide the entire area into EVEN divisions so that there are ODD number of ORDINATES-boundaries

(C) divide the entire area into ODD divisions so that there are EVEN ordinates

(D) both ODD or EVEN number of divisions are acceptable

113. One cubic metre of mild steel weighs about

(A) 1000 kg (B) 3625 kg (C) 7850 kg (D) 12560 kg

114. The quantity of partition walls and honey comb walls are worked out in

(A) M (B) M^3 (C) M^2 (D) Lumpsum

115. The scheduled of rate is prepared on the basis of

(A) labour (B) material

(C) analysis of rates (D) rough estimate

116. The annual periodic payments made for the repayment of the capital invested is known as

(A) annuity (B) sinking fund

(C) out going (D) depreciation

117. The expected task for 12 mm plastering with cement mortar per mason is

(A) 3 cu.m (B) 3 sq.m (C) 6 sq.m (D) 8 sq.m

118. The brick work is not measured in cu.m in the case

(A) one or more than one brick wall (B) brick work in arches

(C) reinforced brick work (D) thin partition wall

119. The expected out turn for earth work in excavation in ordinary soil per mazdoor per day is

(A) 1.00 cu.m (B) 2.00 cu.m (C) 3.00 cu.m (D) 4.00 cu.m

120. The expected out turn of 2.5 cm cement concrete floor per mason per day

(A) 2.5 sq.m (B) 4.0 sq.m (C) 6.0 sq.m (D) 7.5 sq.m

121. In analysis of rates contractor profit is taken at the rate of

(A) 10 times of total cost of material and labour

(B) 5 times of total cost of material and labour

(C) 0.5 times of total cost of material and labour

(D) 0.1 times of total cost of material and labour

122. The amount required to be deposited by a contractor while submitting a tender is known as

(A) fixed deposit (B) caution deposit

(C) security deposit (D) earnest money deposit

123. Energy stored in a material during its deformation is known as

(A) elastic energy (B) plastic energy

(C) strain energy (D) potential energy

124. The moment required to rotate the near end of a prismatic beam through unit angle without translation, when the far end is fixed

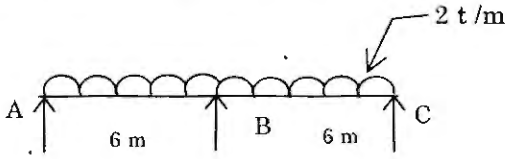
(A) $\frac{EI}{l}$ (B) $\frac{2EI}{l}$ (C) $\frac{3EI}{l}$ (D) $\frac{4EI}{l}$

125. The moment distribution method in structural analysis can be treated as

(A) force method (B) displacement method

(C) flexibility method (D) unit load method

126. A two span continuous beam ABC is simply supported at A & C is continuous over support B. Span AB = 6 m and span BC = 6 m. The beam carries a udl of 2 t/m over both the spans. EI is constant for the entire beam. The fixed end moment at B in span BA or BC would be



(A) 12 t m (B) 6 t-m (C) 8 t-m (D) 9 t-m

127. In a two hinged arch an increase in temperature induces

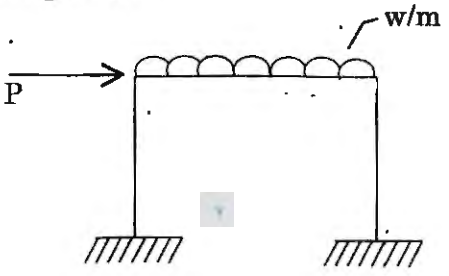
(A) no bending moment in the arch rib

(B) uniform bending moment in the arch rib

(C) maximum bending moment at the crown

(D) minimum bending moment at the crown

128. The frame shown in the figure has



(A) one unknown reaction component (B) two unknown reaction component

(C) three unknown reaction component (D) six unknown reaction component

129. Boussinesq's vertical stress at a point for a concentrated load is independent of

(A) depth of the point below the point of application of the load

(B) magnitude of the load

(C) modulus of elasticity and Poisson's ratio of the soil

(D) radial distance of the point from the line of action of the load

130. Vane shear test is applicable for

(A) dense sand (B) loose sand

(C) soft clay (D) stiff clay

131. Consider the following statements.

Assertion (A) : The quick sand leading to liquefaction is not a type of sand but a flow condition occuring within a cohensionless soil when its effective pressure is reduced to zero.

Reason (R) : Equal amounts of the upward water pressure and the downward pressure of the submerged soil mass are acting.

Select the answer to the above questions using the codes given below :

(A) Both (A) and (R) are true and (R) is the correct explanation of (A)

(B) Both (A) and (R) are true but (R) is not a correct explanation of (A)

(C) (A) is true but (R) is false

(D) (A) is false but (R) is true

132. The maximum vertical stress on a vertical line at a constant radial distance 'r' from the axis of vertical load is induced at the point of intersection of the vertical line with a radial line at an angle of ———————— from the point of application of the concentrated load.

(A) 0° 13' (B) 39° 13' (C) 45° (D) 60°

133. The void ratio and discharge velocity of a soil are 1.0 and 1×10^{-5} cm/s respectively. Its seepage velocity in cm/s is

(A) 4×10^{-5} (B) 2×10^{-5} (C) 1×10^{-5} (D) 0.5×10^{-5}

134. In a CU test, the diameter of Mohr circle for total stresses at incipient failure condition is 200 KPa to a scale. If the pore pressure at failure is 50 KPa, the diameter of Mohr circle for effective stresses at failure drawn to the same scale is equal to

(A) 150 KPa (B) 200 KPa (C) 250 KPa (D) 300 KPa

135. The least count of dial gauge to be used in the laboratory consolidation test is

(A) 0.01 mm (B) 0.002 mm (C) 0.02 mm (D) 0.1 mm

136. Minimum centre to centre spacing of friction piles of diameter (D) as per BIS code is

(A) 1.5 D (B) 2.5 D (C) 2.0 D (D) 3 D

137. Consider the following statements.

1. Coulombs earth pressure theory does not take the roughness of soil into conservation
2. In case of non-cohesive soils, the coefficients of active earth pressure and earth pressure at rest are equal
3. Any movement of retaining wall away from the full corresponds to active earth pressure correction

Of these statements :

(A) only 1 is correct (B) 1 and 2 are correct

(C) only 2 is correct (D) only 3 is correct

138. The bearing capacity of footing size 3 m × 3 m will not be affected by the presence of water table located at a depth below the base of footing of

(A) 1.0 m (B) 3.0 m (C) 1.5 m (D) 6.2 m

139. Which of the following pile will have high level carrying capacity, for ideal conditions?

(A) driven pile (B) bored piles

(C) driven and cost-in-situ piles (D) bored and cost-in-situ piles

140. For the design of strap footing, the following assumption is not made

(A) the strap is perfectly rapid

(B) the interior footing is centrally located

(C) the strap is not subjected to any direct soil pressure

(D) the soil pressure varies linearly

141. Settlement of foundation can be minimized if

(A) bearing capacity is improved (B) void ratio is increased

(C) water content is added (D) external load is increased

142. The devices which are installed for drawing water from the sources are called

(A) aquifers (B) aquiclude (C) filters (D) intakes

143. Which of the following causes a decrease in per capita consumption?

(A) use of metering system

(B) good quality of water

(C) better standard of living of the people

(D) hotter climate

144. The ratio of the yield of water from a rapid sand filter to that from a slow sand filter is

(A) 5 (B) 20 (C) 100 (D) 30

145. The permissible limit of Iron and Chlorides in drinking water are _____ mg/l, _____ mg/l respectively.

(A) 0.8, 800 (B) 1.3, 600 (C) 0.03, 1200 (D) 0.3, 250

146. A rapid test to indicate the intensity of pollution in river water is

(A) Biochemical oxygen demand (B) Dissolved oxygen

(C) MPN (D) Total dissolved solids

147. The role of algae is significant in _____ treatment unit for treating sewage or biodegradable industrial waste.

(A) aerated lagoon (B) oxidation ditch

(C) trickling filter (D) stabilization pond

148. Match the following.

	A		B
(a)	Acid water	1.	Volcanoes
(b)	SO_2	2.	Automobiles
(c)	CO	3.	Thermal power station
(d)	Fly ash	4.	Mining

	(a)	(b)	(c)	(d)
(A)	1	2	3	4
(B)	2	3	4	1
(C)	4	1	2	3
(D)	3	4	1	2

149. LVDT is a

(A) Linear Variable Differential Transducer

(B) Linear Velocity Doppler Transmitter

(C) Low Velocity Differential Transformer

(D) Linear Variable Damping Tester

150. The property of fresh cement concrete, in which the water in the mix tends to rise to the surface while placing and compacting is called

(A) segregation (B) bleeding (C) creep (D) bulking

151. The slump (in mm) required in the trench fill-in situ piling will be

(A) 25 – 75 (B) 50 – 100 (C) 75 – 100 (D) 100 – 150

152. In the standard central point loading test on concrete prism, the maximum fibre stress will occur at

(A) the left end support (B) the right end support

(C) one-third point (D) the loading point

153. The quantity of water required for setting time test of cement is ———— times the quantity of water required for normal consistency test

(A) 0.85 (B) 0.78 (C) 0.65 (D) 0.52

154. The volume of standard gauge box used for volume batching of concrete is

(A) 25 litres (B) 35 litres (C) 42 litres (D) 50 litres

155. The standard rate of application of loading to be adopted in the concrete cube testing is

(A) 14 N/mm^2 per minute (B) 10 N/mm^2 per minute

(C) 7 N/mm^2 per minute (D) 5 N/mm^2 per minute

156. Surfaces of members in tidal zones will come under which category of environmental exposure condition?

(A) moderate (B) severe (C) very severe (D) extreme

157. A square slab panel is supported on only two parallel sides. It will act as

(A) One – way slab
(B) One – way continuous slab
(C) Two – way slab
(D) Two – way continuous slab

158. The total area of side face reinforcement provided along the two faces of a beam should not be less than

(A) 0.3 percent of the web area
(B) 0.3 percent of gross area
(C) 0.1 percent of the web area
(D) 0.1 percent of gross area

159. The ultimate strain in concrete in bending will be taken as

(A) 0.002 (B) 0.003 (C) 0.0035 (D) 0.004

160. If the strain in the extreme layer of tensile steel in a column is greater than or equal to 0.0005, it denotes the

(A) on set of cracking in column
(B) compression – controlled failure
(C) balanced failure
(D) tension – controlled ductile failure

161. When the isolated footing is loaded, the clayey soil under the footing

(A) will be subjected to uniform soil pressure
(B) relieves the pressure near the middle of the footing
(C) will have minimum pressure near the edges
(D) will be subjected to a trapezoidal non–uniform pressure

162. Two plates 16 mm and 14 mm are jointed by the fillet weld. the maximum size of the fillet weld is

(A) 18.5 mm (B) 17.5 mm (C) 15.5 mm (D) 12.5 mm

163. The proof stress of high tensile wires are measured at

(A) 0.7% residual strain
(B) 0.4% residual strain
(C) 0.2% residual strain
(D) 0.1% residual strain

164. The economic spacing of roof trusses depends on

(A) cost of purlins and cost of root covering
(B) cost of roofing and dead loads
(C) live loads and dead loads
(D) cost of purlins and live loads

165. An agricultural land is known as water logged when

(A) gravity drainage has ceased

(B) permanent wilting point is reached

(C) the soil become completely saturated

(D) capillary fringe reaches the root zone of the plants

166. The total water resources available in India is

(A) 1850 cubic km (B) 1580 cubic km

(C) 1350 cubic km (D) 1530 cubic km

167. The standard project flood is

(A) the same as the maximum probable flood

(B) the same as the design flood

(C) larger than the maximum probable flood

(D) about 50% of the maximum probable flood

168. Out of the total water present on the globe the saline water of oceans accounts for

(A) 95.2% (B) 97.2% (C) 96.2% (D) 98.2%

169. The live storage requirement for a reservoir is to be determined by

(A) topographical survey (B) double mass curve analysis

(C) annual demand (D) mass curve analysis

170. Ombrometer is used to measure

(A) soil moisture state of a plant (B) rainfall depth

(C) root zone depth (D) leaf area

171. What is the distance to the centroid of Nash's instantaneous unit Hydrograph from the origin?

(A) n/K (B) n/K^2 (C) nK (D) nK^2

172. A catchment is made of 60% area with run off coefficient 0.4 and remaining 40% area with run off coefficient 0.6. What is the weighted run off coefficient to be used in rational formula?

(A) 0.24 (B) 0.48 (C) 0.5 (D) 0.6

173. The net head under which the turbine reaches its peak efficiency at synchronous speed is called

(A) rated head (B) gross head

(C) operating head (D) design head

174. The common method of irrigating row crops is

(A) Contour farming (B) Furrow method

(C) Flooding method (D) Sprinkler irrigation

175. Traffic density is

(A) Number of vehicles passing in one hour

(B) Number of vehicles per unit length

(C) Number of vehicles in specific direction per hour

(D) Number of vehicles per lane in specific direction

176. An instrument used to study 'spot speeds' in Traffic Engineering is

(A) Enoscope (B) Speed recorder (C) Lux meter (D) Sound level meter

177. Major reason for high level of road accidents in India is due to

(A) Lack of knowledge with people

(B) Lack of fund availability

(C) Lack of proper enforcement of traffic rules

(D) Lack of traffic control devices

178. The basic root cause of today's traffic problem is

(A) Lack of commitments of professionals

(B) Lack of fund availability

(C) Lack of land use transport interaction in planning urban areas

(D) Lack of time availability

179. The volume of traffic, that would immediately use a new or an improved road when opened to traffic is known as

(A) Current traffic (B) Generated traffic

(C) Development traffic (D) Future traffic

180. The instantaneous speed of a vehicle as it passes a point on a highway is known as

(A) Journey speed (B) Running speed (C) Design speed (D) Spot speed

181. The theoretical capacity (C) of a highway is given by

(A) $C = \frac{1000\,S}{V}$ (B) $C = \frac{100\,V}{S}$ (C) $C = \frac{1000\,V}{S}$ (D) $C = \frac{1000\,V}{2S}$

182. The minimum width of shoulder recommended by the IRC is

(A) 2.2 m (B) 2.3 m (C) 2.4 m (D) 2.5 m

183. In highway geometric design, the desirable length of overtaking jone is kept at

(A) 5 times overtaking sight distance (B) 6 times overtaking sight distance

(C) 7 times overtaking sight distance (D) 8 times overtaking sight distance

184. Overtaking sight distance is also called as

(A) Stopping sight distance (B) Headlight sight distance

(C) Non passing sight distance (D) Passing sight distance

185. The primary road system classification comprises of

(A) Expressways and National Highways

(B) State Highways and Major District Roads

(C) Other District Roads and Village Roads

(D) Major District Roads and Other District Roads

186. The first 20-year road development plan for India was called as

(A) Bombay Road Plan (B) Nagpur Road Plan

(C) Lucknow Road Plan (D) Delhi Road Plan

187. A runway is aligned such that it is exactly laid along EAST-WEST direction. Then for that runway, choose the correct pair of RUNWAY number

(A) 0 – 90 (B) 90 – 180 (C) 90 – 270 (D) 9 – 27

188. In curved portions of railway tracks, the gradient of track laying is

(A) slightly lesser (reduced) than the gradient in straight portions

(B) slightly HIGHER than the gradient in straight portions

(C) gradient in curves may be higher or lesser than the gradient in straight tracks

(D) gradient in curves should be same as the gradient in straights

189. Coning of wheels is done for the purpose of

(A) reducing contact area between wheel and rail

(B) to prevent SLIPPING or SKIDDING of wheels while rolling on the curved tracks

(C) reducing the noise due to wheel rolling vibration

(D) to reduce centrifugal force while travelling on curves

190. The type of rail piece which move left and right within the main rails and which are sharp ended are called as

(A) Stock Rail (B) Check Rail

(C) Tongue Rail (D) Stretcher Bar

191. With respect to transition curves, choose the odd one out

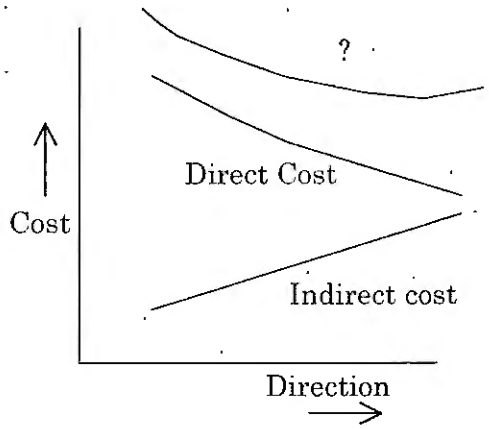
(A) Cubic parabola curve (B) Simple circular curve

(C) Spiral curve (D) Bernoulli's Lemniscate curve

192. Expected time of an activity is calculated in PERT using the formula

(A) $\frac{4a+4m+4b}{6}$ (B) $\frac{a+m+b}{6}$ (C) $\frac{a+4m+b}{6}$ (D) $\frac{a+6m+b}{4}$

193. In the figure, name the curve marked (?)



(A) Crash cost curve (B) Normal cost curve

(C) Total cost curve (D) Other cost curve

194. In a time scaled version of network, critical activities are shown along

(A) an inclined path (B) an oblique path

(C) a vertical straight path (D) a horizontal straight path

195. In PERT, the variance of an activity is determined by

(A) $\frac{b-a}{6}$

(B) $\frac{(b-a)^2}{6}$

(C) $\left(\frac{b-a}{6}\right)^2$

(D) $\frac{b^2-a^2}{6}$

196. The critical path duration of a project is 15 months with a standard deviation of 3 months. What is the probability of completing the project in 15 months?

(A) 25%

(B) 50%

(C) 75%

(D) 100%

197. RAM is used as a short memory because it

(A) is very expensive

(B) has small capacity

(C) is programmable

(D) is volatile

198. One of the major benefits of using CAD in tool design is that

(A) product design represents approximately one-half the engineering costs

(B) tool motions can be checked to see if there is interference between the tool and the object

(C) there is better coordination in the materials – handling area

(D) it simplifies the trial-and-error method

199. What kind of capability is required for one plane to interface with a plotter or printer?

(A) Graphics cable

(B) RGB monitor

(C) Graphics board

(D) Co-processor

200. Status indicators are located on the

(A) Vertical scroll bar

(B) Horizontal scroll bar

(C) Formula bar

(D) Standard tool bar