

APTITUDE

DIRECTIONS: (Question nos. 1 to 3) Read the following passage carefully and answer the questions given below.

A group of seven friends Anil, Vinod, Sumit, Dilip, Indra, Firoz and Gaurav work as Engineer, Accountant, IT Officer, Technician, Clerk, Physiotherapist and Research Analyst for companies L, M, N, P, Q, R and S but not necessarily in the same order. Sumit works for company 'N' and is neither a Research Analyst nor a clerk. Indra is an IT officer and works for company 'R' Anil work as Physiotherapist and does not work for company L or Q. The one who is an Accountant works for company M. The one who works for company L works as a technician. Firoz works for company Q. Gaurav works for company P as Research Analyst. Dilip is not an Accountant.

1. Who amongst the following works as accountant?

- A. Vinod B. Anil
C. Firoz D. Dilip

Ans. A

2. What is the profession of Sumit?

- A. Technician B. Clerk
C. Engineer D. None of these

Ans. C

3. Which of the following combinations of person, profession and company is correct?

- A. Anil –Physiotherapist –M
B. Firoz –Clerk – Q
C. Vinod –Accountant – R
D. None of these

Ans. B

4. In a group of 36 persons, a total of 16 take cold drink while 9 take cold drink but not ice-cream. How many persons in this group take ice-cream but not cold-drink?

- A. 27 B. 20
C. 11 D. 23

Ans. B

5. Match the pair correctly.

- | State | Hill-Station |
|----------------|----------------|
| A. Uttarakhand | 1. Chittangong |
| B. Assam | 2. Kalimpong |
| C. Tripura | 3. Mussoorie |
| D. West Bengal | 4. Haflong |
- A. A-3, B-4, C-2, D-1
B. A-4, B-2, C-1, D-3
C. A-3, B-2, C-1, D-4
D. A-3, B-4, C-1, D-2

Ans. D

6. Article 243 B(1) of the constitution provides for constitution of Panchayat in every state. The level of Panchayats referred under this is:

- A. Village and District level
B. Village, intermediate and District Level
C. Village level only
D. District level only

Ans. B

7. Jaggery is the main source of:

- A. Protein B. Carbohydrate
C. Fat D. None of these

Ans. B

8. The black hole theory was discovered by:

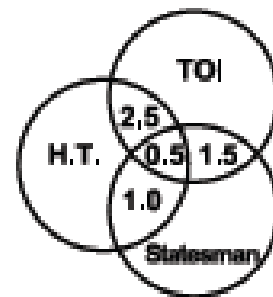
- A. Hargobind Khurana
B. C.V. Raman
C. S. Ramnijan
D. S. Chandrashekhar

Ans. D

DIRECTIONS: The Venn diagram given below shows the estimated readership of 3 daily newspapers (H.T, TOI & Statesman) in Delhi. The total readership and advertising cost for each of these papers is as below:

Newspaper	Readership (Lakhs)	Advertising cost (Rs per sq cm)
H.T.	8.7	6000
TOI	9.1	6500
Statesman	5.6	5000

The total population of the city is approximately 14 million. The common readership (in lakhs) indicated in the Venn diagram



9. The number of people (in lakhs) who read at least one newspaper is:

- A. 4.7 B. 23.4
C. 17.4 D. None of these

Ans. C

10. In a high flying aeroplane, the ink of the fountain pen leaks out because:

- A. Atmospheric pressure increases
B. Atmospheric pressure reduces
C. Atmospheric temperature increases
D. Atmospheric temperature reduces

Ans. B

11. Match the following:

Field Nobel	Prize winner 2015
A. Economics	1. Svetlana Alxievich
B. Peace	2. Angus Deaton
C. Literature	3. Takaaki Kajita & Arthur B. McDonald
D. Physics	4. Tunisian National Dialogue Quartet
A. A3, B4, C1, D2	B. A3, B1, C2, D4
C. A1, B4, C3, D2	D. A2, B4, C1, D3

Ans. D

12. During whose reign did Hiuen Tsang visit the Chalukya Kingdom?

- A. Pulakesin I B. Kirtivarman
C. Vinayaditya D. Pulakesin II

Ans. D

13. The capital of world youngest nation South Sudan is:

- A. Juba B. Rumbek
C. Malakal D. Wau

Ans. A

14. The equator does not pass through which of the following countries:

- A. Kenya B. Mexico
C. Indonesia D. Brazil

Ans. B

15. Number of diagonals in a 30 sided convex polygon will be:

- A. 405 B. 955
C. 818 D. 378

Ans. A

DIRECTIONS: In the following number series only one number is wrong. If the wrong number is corrected, the series get established following a certain logic. Below the series a number is given followed by (a), (b), (c), (d), (e) and (f). You have to complete the series following the same logic as in the given series after correcting the wrong number. Now answer the following questions giving the correct values for the letter in the questions.

16. 2 14 18 46 82 176 338

4 (a) (b) (c) (d) (e) (f)

What will come in place of (e)

- A. 238 B. 338
C. 218 D. None of these

Ans. A

17. What is the "Motto" of Olympics 2020:

- A. Live your passion
B. One world, One Dream
C. Inspire a Generation
D. Discover Tomorrow

Ans. D

18. 'C' is a place which is located 2 km away in the northwest direction from the capital Z. R is another place that is located 2 km away in the south-west direction from 'C'. 'M' is another place and that is located 2 km away in the north-west direction from 'R'. 'T' is yet another place that is located 2 km

away in the south-west direction from 'M'. In which direction is 'T' located in relation to 'Z'?

- A. South-West B. West
C. North D. None of these

Ans. B

19. Find the odd one out?

- A. FIFA World Cup B. Ryder Cup
C. Walker Cup D. Solheim cup

Ans. A

20. The grant of Diwani of Bengal, Bihar and Orrisa is associated with:

- A. Shah Alam II
B. Bahadur Shah
C. Nawab Asif-ud-Daula
D. Nawab Shuja-ud-Daula

Ans. A

21. Union Government appointed four brand Ambassadors for Digital India Programme recently. Who among these is an author and ethical hacker:

- A. Pranav Mistry B. Satwat Jagwani
C. Krati Tiwari D. Ankit Fadia

Ans. D

22. What is the chronological (first published first and so on) correct sequence of the following books?

1. Richard Attenborough – In search of Gandhi
2. Louis Fischer – The life of Mahatama Gandhi
3. E.H. Erikson – Gandhi's truth
4. J. Eaton – Gandhi, Fighter without a sword
Select the correct answers from the codes given below.

- A. 4, 2, 3, 1 B. 4, 3, 1, 2
C. 2, 4, 3, 1 D. 1, 2, 4, 3

Ans. A

23. In a code 'Mumbai' is written as 'Sostpk' and 'Chennai' is written as 'dcfmmpk', then "bench" will be written as:

- A. m f m d c B. t m f d c
C. t f m d c D. t f d m c

Ans. C

DIRECTIONS: To answer the following question, use the information given below.

- i. There are six persons A, B, C, D E and F in a family.
ii. There are two couples in the group.
iii. A is the father of C who is a doctor.
iv. E is the son of C.
v. F is the grand daughter of D.
vi. The father of F is B, who is a professor.
vii. E and F are unmarried.

24. Who is the grandmother of E?

- A. C B. D
C. B D. None of these

Ans. B

25. Arrange the following rational members in ascending order:

$$\frac{-7}{10}, \frac{5}{-8}, \frac{2}{-3}$$

- A. $\frac{2}{-3} < \frac{5}{-8} < \frac{-7}{10}$ B. $\frac{5}{-8} < \frac{2}{-3} < \frac{-7}{10}$
 C. $\frac{-7}{10} < \frac{2}{-3} < \frac{5}{-8}$ D. $\frac{-7}{10} < \frac{5}{-8} < \frac{2}{-3}$

Ans. C

26. Given that in a standard code pattern
 ABCD is coded as EFGH
 JKLM is coded as NOPQ
 then RSTU is coded as:

- A. W V Y X B. Q P U V
 C. V W X Y D. V W Y Y

Ans. C

27. In a certain code, 'TEAMWORK' is written as 'NBFUJQNV' and 'SOME' is written as 'PTDL'. How is 'PERSON' written in that code?

- A. SQFNMR B. SFQMNR
 C. SFQNMR D. SQMFNR

Ans. B

28. How many triangles are there in the following figure?



- A. 11 B. 13
 C. 10 D. 9

Ans. B

29. A sphere of radius x is melted and its volume is divided into two equal parts. One part is cast into a cylinder of height 10 cm. and second a cone of the same height. The ratio of the cylinder radius to the cone radius is:

- A. $1 : \sqrt{3}$ B. $1 : 3$
 C. $\sqrt{3} : 2$ D. None of these

Ans. A

30. Sukriti and Saloni are athletes. Sukriti covers a distance of 1 km in 5 minutes and 50 seconds, while saloni covers the same distance in 6 minutes and 4 seconds. If both them start together and run at uniform speed, by what approximate distance will sukriti win a 5 km mini marathon?

- A. 200 m B. 225 m
 C. 250 m D. 275 m

Ans. A

31. One side of a right-angled triangle is 126 cm. The difference between the hypotenuse and the other side is 42 cm. The length of the hypotenuse is:

- A. 168 cm B. 189 cm
 C. 210 cm D. None of these

Ans. C

32. Three wheels make 60, 36 and 24 revolutions per minute. Each has a red spot on its rim, which is at the lowest position at time zero. The red spot will all be at this position again after:

- A. 2 seconds B. 5 seconds
 C. 4 seconds D. None of these

Ans. B

33. A train can travel 50% faster than a car. Both start from point A at the same time and reach point B 75 kms away from A at the same time. On the way, however, the train lost about 12.5 minutes while stopping at the stations. The speed of the car is:

- A. 100 km/h. B. 110 km/h.
 C. 120 km/h. D. 130 km/h.

Ans. C

34. An empty tank is connected with pipes A, B and C. A and B are inlet pipes and they fill the tank in 6 hours and 8 hours respectively, while C is an outlet pipe and it empties the completely filled tank in 5 hours. Find the time in which the tank will be completely filled if all the pipes are opened together.

- A. $10\frac{9}{11}$ hours B. $9\frac{9}{11}$ hours
 C. $10\frac{10}{11}$ hours D. $9\frac{10}{11}$ hours

Ans. C

35. Probability of getting a multiple of 2 on one dice and a multiple of 3 on the other dice, when both dice are thrown simultaneously is:

- A. $\frac{1}{6}$ B. $\frac{5}{12}$
 C. $\frac{11}{36}$ D. $\frac{5}{36}$

Ans. C

36. Mid points of the side of an equilateral triangle of side 18 cm are joined to form another triangle, whose mid points are further joined to form a different triangle and this process is repeated indefinitely. The sum of the perimeters of all the triangles will be:

- A. 72 cm B. 108 cm
 C. 144 cm D. 172 cm

Ans. B

37. If the radius of a right circular cylinder is decreased by 50% and its height is increased by 60%, its volume will be decreased by:

- A. 30% B. 40%
 C. 60% D. 70%

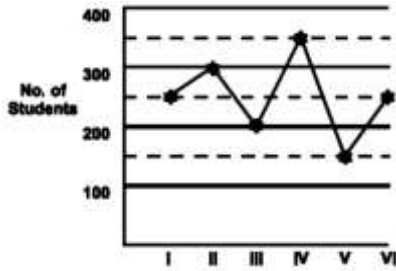
Ans. C

38. A hall 50 m long and 45 m broad is to be paved with square tiles. Find the largest tile as well as its number in the given options so that the tiles exactly fit in the hall?

- A. 36 sq m and 80 tiles
 B. 16 sq m and 80 tiles
 C. 25 sq m and 90 tiles
 D. 36 sq m and 90 tiles

Ans. C

39. Number of students in different specialisations in an institute



Number of students in specialisation II is what percent of the total number of students in the institute.

- A. $23\frac{2}{3}$ B. $23\frac{1}{3}$
C. $22\frac{1}{3}$ D. 20%

Ans. D

40. The perimeter of a rhombus is 40 cm and the measure of an angle is 60° , then the area of it is-

- A. $100\sqrt{3}$ cm² B. $75\sqrt{3}$ cm²
C. $180\sqrt{3}$ cm² D. $50\sqrt{3}$ cm²

Ans. D

41. The difference between the compound interest and the simple interest on a certain sum of money at 12% per annum for 2 years is ₹ 1800. Find the principal sum when the interest is compounded annually:

- A. ₹ 1,20,000 B. ₹ 1,25,000
C. ₹ 1,28,000 D. None of these

Ans. B

42. Ritu had 400 mangoes. She sold 60 mangoes at 25% gain, 80 mangoes 20% gain, 120 mangoes at 10% gain and 140 mangoes at 20% loss. Her net gain/loss percent is:

- A. $7\frac{1}{2}$ % gain B. $4\frac{3}{4}$ % gain
C. $3\frac{3}{4}$ % gain D. None of these

Ans. A

43. Match the personalities with the state to which they belong.

STATE	PERSONALITIES
A. Uttarakhand	1. Fakhruddin Ali Ahmad
B. West Bengal	2. S.D. Burman
C. Tripura	3. Pranab Mukherjee
D. Assam	4. Govind Ballabh Pant
A. A-1, B-3, C-4, D-2	
B. A-4, B-3, C-1, D-2	
C. A-1, B-3, C-2, D-4	
D. A-4, B-3, C-2, D-1	

Ans. D

44. A man buys milk at a certain price per Kg. and after mixing it with water sells it again at the same price. How many grams of water he mixes in every Kg. of milk if he makes a profit of 25%:

- A. 250g B. 200g
C. 150g D. 30g

Ans. A

45. When three coins are tossed together, the probability that all coins have the same face is:

- A. $\frac{1}{4}$ B. $\frac{1}{6}$
C. $\frac{1}{3}$ D. None of these

Ans. A

TECHNICAL (APTITUDE)

46. The allowable stress to which a structural member can be subjected, is called:

- A. Working stress
B. Permissible stress
C. Tensile stress
D. Either A. or B.

Ans. D

47. A flow in which the quantity of liquid flowing per second is constant, is called:

- A. Stream line flow
B. Turbulant flow
C. Steady flow
D. Laminar flow

Ans. D

48. The piles which do not support the load by themselves, but act as a medium to transmit the load from the foundation to the resisting sub-stratum are known as:

- A. Friction piles B. Bearing piles
C. Batter piles D. Compaction piles

Ans. A

49. A structural member subjected to compressive force in a direction parallel to its longitudinal axis is called:

- A. Column
B. Post
C. Stanchion
D. Any one of above

Ans. D

50. In a Tee-Beam the breadth of the rib is equal to the:

- A. Total thickness of slab including cover
B. Width of beam in compression zone
C. Width of beam in tensile zone
D. None of these

Ans. C

51. A tape of length ℓ and weight w kg/m is suspended at its ends with a pull of p kg, the sag correction is:

- A. $\frac{\ell^2 w^2}{24p^2}$ B. $\frac{\ell^2 w^3}{24p^2}$
C. $\frac{\ell w^2}{24p}$ D. $\frac{\ell^2 w^2}{24p^3}$

Ans. A

52. The rise and fall method of reduction of levels provides a check on:

- A. Back sights
- B. Fore sights
- C. Intermediate sights
- D. All of these

Ans. D

53. The process of mixing some mortar in the mixer at the beginning of the first batch concrete mixing is called:

- A. Buttering
- B. Borrowing
- C. Initiating
- D. None of these

Ans. A

54. In the design of purlins, depth of angle section should not be less than:

- A. L/45
- B. L/60
- C. L/50
- D. No relationship

Ans. A

55. The units of viscosity are:

- A. kg sec/m²
- B. n sec/m²
- C. N sec/m²
- D. m³ / sec

Ans. B

56. Hydraulic radius is equal to:

- A. Area divided by the square of the wetted perimeter
- B. Area divided by the wetted perimeter
- C. Wetted perimeter divided by area
- D. Square root of the area

Ans. B

57. The first stage of natural process of sludge digestion is:

- A. Acid fermentation
- B. Acid regression
- C. Alkaline fermentation
- D. None of these

Ans. A

58. On wetting, cohesive soils:

- A. Loose permeability
- B. Gain shear strength
- C. Loose elasticity
- D. Decrease their shear strength

Ans. D

59. Setting of Laminate transition curve is done with:

- A. Perpendicular offsets
- B. Radial offsets
- C. Deflection angles
- D. Polar deflection angles

Ans. D

60. A row of rivets parallel to the direction of force is called:

- A. Pitch
- B. Gauge distance
- C. Gauge
- D. Edge line

Ans. C

61. The effective depth of T-beam is the distance between the:

- A. Centre of flange to the top of tensile reinforcement
- B. Top of flange to the centre of tensile reinforcement
- C. Bottom of flange to centre of tensile reinforcement
- D. Top of flange to bottom tensile reinforcement

Ans. B

62. According to Rankine's formula the minimum depth of foundation should be:

- A. $\frac{W}{P} \left(\frac{1 + \sin \theta}{1 - \sin \theta} \right)^2$
- B. $\frac{W}{P} \left(\frac{1 - \sin \theta}{1 + \sin \theta} \right)^2$
- C. $\frac{W}{P} \left(\frac{1 + \sin \theta}{1 - \sin \theta} \right)^2$
- D. None of these

Ans. B

63. The most economical section of a trapezoidal channel is one which has hydraulic mean depth equal to:

- A. $\frac{1}{2}$ depth
- B. $\frac{1}{2}$ breadth
- C. $\frac{1}{2} \times \text{depth} \times \text{breadth}$
- D. $\frac{1}{2} (\text{depth and breadth})$

Ans. A

64. A line joining some fixed stations on main survey lines is:

- A. Check line
- B. Base line
- C. Tie line
- D. Cross line

Ans. B

65. Which of the following instruments is used for spot speed measurement of a vehicle?

- A. Microscope
- B. Enoscope
- C. Stethoscope
- D. Stereoscope

Ans. B

66. In which of the following, kerosene oil is used for its preparation?

- A. Emulsion
- B. Slow curing cutback
- C. Medium curing cutback
- D. Rapid curing cutback

Ans. C

67. Which of the followings is measured in a CBR test on soils:

- A. Flow value
- B. Shear strength
- C. Tensile strength
- D. Compressive strength

Ans. B

68. Match List I with II and select correct answer from the codes given below the Lists:

List I

- A. Abrasion test
- B. Crushing strength test
- C. Impact Test
- D. Soundness Test

List II

- 1. Durability
- 2. Toughness
- 3. Hardness
- 4. Compressive strength

Codes:

- A. A-3, B-4, C-2, D-1
- B. A-4, B-3, C-2, D-1
- C. A-3, B-2, C-4, D-1
- D. None of these

Ans. A

69. A short column 300 mm x 300 mm is reinforced with 4 bars of 20mm dia. (Fe-415 grade). If concrete is M-20 grade, the max. axial load P_u (kN) allowed on it is:

- A. 1059.0
- B. 1159.0
- C. 1173.0
- D. None of these

Ans. A

70. The height of instrument (HI) is equal to:

- A. R.L. of BM + BS
- B. R.L. of BM + FS
- C. R.L. of BM + IS
- D. BS + FS

Ans. A

71. A vertical member of frame, which is employed to subdivide a window or door vertically is:

- A. Jamb
- B. Panel
- C. Mullion
- D. Transoms

Ans. C

72. The modulus of elasticity (E) of concrete is given by:

- A. $E = 1000f_{ck}$
- B. $E = 5700\sqrt{f_{ck}}$
- C. $E = 5700m_g$
- D. $E = 1000\sqrt{f_{ck}}$

Ans. B

73. A given material has young's modulus E, modulus of rigidity G and poisson's ratio 0.25. The ratio of young's modulus to modulus of rigidity of this material is:

- A. 3.75
- B. 3
- C. 2.5
- D. 1.5

Ans. C

74. A block is subjected to normal stresses σ_x and σ_y and shear stresses τ along two planes at right angles. This principal Planes inclined θ° to σ_x axis will be such as:

- A. $\tan 2\phi = \frac{2\tau}{\sigma_y - \sigma_x}$
- B. $\tan 2\phi = \frac{-2\tau}{\sigma_x - \sigma_y}$

$$C. \tan 2\phi = \frac{-2\tau}{\sigma_y - \sigma_x}$$

- D. None of these

Ans. B

75. The greatest eccentricity which a load can have without producing tension in a short hollow circular column producing of outside diameter 'D' and inside diameter 'd' is:

- A. $\frac{D^2 - d^2}{8D}$
- B. $\frac{D^2 + d^2}{8D}$
- C. $\frac{D^2 + d^2}{4D}$
- D. $\frac{D^2 - d^2}{4D}$

Ans. B

76. Mostly used coagulant in treatment of water is:

- A. Chlorine
- B. Alum
- C. Lime
- D. Bleaching powder

Ans. B

77. Match List I with List II and select the correct answer using the codes Given below the lists:

List I

- A. Plain sedimentation test
- B. Ion-exchange
- C. Flocculator
- D. Rapid sand filter

List II

- 1. Hydraulic loading rate
- 2. Exhaust of bed
- 3. Settling velocity
- 4. Velocity gradient

Codes:

- A. A-1, B-4, C-2, D-3
- B. A-2, B-1, C-3, D-4
- C. A-3, B-2, C-4, D-1
- D. None of these

Ans. C

78. The main object of providing a camber is:

- A. To make the road surface impervious
- B. To make the road surface durable
- C. To make the road free of stagnant water
- D. All of these

Ans. C

79. The ratio of ultimate creep strain to elastic strain is known as:

- A. Creep modulus
- B. Creep coefficient
- C. Creep-strain ratio
- D. Tertiary creep

Ans. B

80. The settlement of coarse aggregate towards bottom with scum rising towards the surface is known as:

- A. Bleeding
- B. Capillarity
- C. Laitance
- D. Permeability

Ans. C

81. The forces which meet at one point, but their line of action do not lie in a plane, are called:

- A. Coplaner non-concurrent forces
- B. Non-coplaner concurrent forces
- C. Non-coplaner non-concurrent forces
- D. Intersecting forces

Ans. B

82. Chromatic aberration in a telescope is reduced by using:

- A. A convex lens
- B. Compound lens convex and concave lenses
- C. A concave lenses
- D. Two convex lenses

Ans. B

83. The outer axis of a theodolite is:

- A. The axis of the altitude level
- B. The trunnion axis
- C. The axis passing through the centre of the horizontal graduated circle
- D. The line of collimation of the theodolite

Ans. C

84. To determine the whole volume formed by given sections over a given length, the prismoidal formula can be applied:

- A. Only when the number of sectional areas is odd
- B. Only when the number of sectional areas is even
- C. Irrespective of the number of sectional areas being odd or even
- D. Only for three sections at a time

Ans. A

85. A unit working purely on anaerobiosis is:

- A. Septic tanks
- B. Trickling filter
- C. Contact bed
- D. Activated sludge process

Ans. A

86. A contour line:

- A. Can not split and continue in different directions.
- B. Can split and continue in different directions.
- C. Can split but continue in two directions only.
- D. Can split but has to return to meet again.

Ans. A

87. A pile is embedded quite deep in a clay stratum. The clay has a cohesion of 3.5 t/m^2 . The ultimate point resistance of the pile will be:

- A. 19.6 t/m^2
- B. 24.5 t/m^2
- C. 21.0 t/m^2
- D. None of these

Ans. D

88. Match List I with List II and select the correct answer using the codes given below the:

- | (Organism) | (Disease Transmitted) |
|-------------|------------------------|
| A. Bacteria | 1. Infection hepatitis |
| B. Viruses | 2. Amoebic dysentery |

- | | |
|--------------|---------------------------|
| C. Protozoa | 3. Paratyphoid |
| D. Helminths | 4. Guinea-worm infections |

Codes:

- A. A-1, A-2, C-4, D-3
- B. A-3, B-1, C-2, D-4
- C. A-2, B-4, C-3, D-1
- D. None of these

Ans. B

89. Bearings are provided in bridges, in order to:

- 1. Distribute the load from superstructure on a large areas and to transfer to piers
- 2. Allow the grid order of the bridge to taken a free angular movement at the ends when loaded
- 3. Allow free movement of girders due to temperature variations.
- 4. Prevent excessive damage to the bridge if any pier sink slightly

Of these the correct utilities are

- A. 2, 3 and 4
- B. 1, 2 and 3
- C. 1, 2 and 4
- D. 1, 2, 3 and 4

Ans. D

90. A CPM network is to be drawn considering:

- A. Activity sequencing without resource availability
- B. Least direct cost durations for activities
- C. Least total cost duration for activities
- D. Activities sequencing considered resources availability for each individual activity separately

Ans. D

91. The minimum ratio of thickness of elements in compression, in terms of their outstanding length has been specified to prevent:

- A. Fracture
- B. Bearing failure
- C. Tension failure
- D. Local buckling

Ans. D

92. The weight of a rail and its section is decided on the basis of:

- A. Heaviest axle load
- B. Maximum permissible speed
- C. Depth of Ballast
- D. All of these

Ans. D

93. Concentration of fluorides desirable in water is:

- A. 1 to 2 mg/litre
- B. Not more than 1 mg/litre
- C. 10 to 20 mg/litre
- D. Not more than 250 mg/litre

Ans. B

94. The water content in the soil is:

- A. Ratio of volume of water to volume of soil
- B. Ratio of volume of water to volume of solids
- C. Ratio of weight of water to volume of soil
- D. Ratio of weight of water to weight of solids

Ans. D

95. Moment Distribution method of Structural analysis is applicable to:

- A. Stable but statically indeterminate structures
- B. Stable but statically determinate structures
- C. Unstable but statically indeterminate structures
- D. Unstable but statically determinate structures

Ans. A

96. In a CBR test, If the CBR value at 5 mm is greater than that at 2.5 mm:

- A. The higher value should be chosen
- B. The test should be repeated
- C. Average value of the two should be used
- D. None of these

Ans. B

97. The ratio of the total elongation of a bar of uniform circular cross-section produced under its own weight to the elongation produced by an external load equal to the weight of the bar is:

- A. 2
- B. 1
- C. 0.5
- D. None of these

Ans. C

98. The ratio of the total elongation of a bar of uniform cross-section produced under its own weight to the elongation produced by an external load equal to the weight of the bar is:

- A. 2
- B. 1
- C. $\frac{1}{2}$
- D. $\frac{1}{4}$

Ans. C

99. In a restrained rectangular slab subjected to a uniformly distributed load, the yield lines form first:

- A. Along the shorter span on the loaded face of the slab
- B. Along the longer span on the loaded face of the slab
- C. At the intersection of shorter and longer side
- D. Along the centre line of the unloaded face of the slab

Ans. D

100. The propagation of a shear crack is a prestressed concrete member depends on:

- A. Tensile reinforcement
- B. Compression reinforcement
- C. Shear reinforcement
- D. Shape of the cross section of beam

Ans. B

101. In a plate girder design, the rivets connecting the flange angles and the flange plates have to be designed for:

- A. Bending stress
- B. Single shear
- C. Double shear
- D. Bending and shear

Ans. B

102. Plain cement concrete is strong in taking:

- A. Tensile stresses
- B. Compressive stresses

C. Shear stresses

D. Tear stresses

Ans. B

103. The type of surveying in which the curvature of the earth is taken into account is called:

- A. Geodetic surveying
- B. Plane surveying
- C. Preliminary surveying
- D. Topographical surveying

Ans. A

104. A simply supported beam of span 'L' carries a concentrated load 'W' at mid-span. If the width 'b' of the beam is constant and its depth is varying through out the span, then what would be its mid-span depth when design stress is 'f'?

- A. $\sqrt{\frac{6WL}{bf}}$
- B. $\frac{6WL}{bf}$
- C. $\sqrt{\frac{3WL}{2bf}}$
- D. $\frac{3WL}{2bf}$

Ans. C

105. A column hinged at both ends has a crippling load P. If the central deflection is made zero by providing suitable support, the crippling load will be:

- A. 16 P
- B. 4 P
- C. $\frac{1}{4} P$
- D. $\frac{1}{6} P$

Ans. B

106. The thixotropy of soil is the phenomenon of:

- A. Thickening of soil particles with water
- B. Cohesion of soil particles in optimum moisture
- C. Rotation of soil particles into a more stable state which occurs in the remoulding process
- D. None of these

Ans. C

107. The impact of a sewage outfall into a river can be assessed by monitoring:

- A. Ammonical nitrogen, phosphorus, fluoride & hardness
- B. DO, BOD, Coliform MPN & nitrate – N
- C. Chloride, alkalinity, hardness & sulphate
- D. pH, turbidity, conductivity and colour

Ans. B

108. In a broad-crested weir, the discharge is maximum if the head of water on the downstream side of weir is the head of water on the upstream side of weir:

- A. Equal to
- B. One third
- C. Two third
- D. Three- fourth

Ans. C

109. A beam of length (l+2a) has supports 'l'aparts with an overhang 'a' on each side. The beam carries a concentrated load 'W' at each end. The shear force between the two supports is given by:

- A. Zero
- B. 0.5W
- C. W
- D. 2W

Ans. A

110. A point load of 20 kN acting at the quarter span point of a simply supported beam produces a central deflection of 2 mm. For a central load of 40 kN, the deflection at the quarter span point will be:
- A. 4 mm B. 8 mm
C. 2 mm D. 1 mm

Ans. A

111. Mohr's circle for a direct shear test could be drawn:
- A. At the beginning of the test
B. At the intermediate state of test
C. At the failure state of test
D. At no stage of test

Ans. C

112. If levelling staff is held inclined at a staff station, the reduced level calculated from observation would be:
- A. True R.L.
B. More than true R. L.
C. Less than true R. L.
D. Equal to R. L. of Bench mark

Ans. C

113. A steel beam supporting load from the floor slab as well as from wall is termed as:
- A. Stringer beam
B. Lintel beam
C. Spandrel beam
D. Header beam

Ans. C

114. Rivet value is equal to:
- A. Strength of a rivet in shearing
B. Strength of a rivet in bearing
C. Minimum of A. and B.
D. Maximum of A. and B.

Ans. C

115. A foundation consisting of thick R.C.C. slab covering the entire area of the bottom of structure is known as:
- A. Pile foundation
B. Pier foundation
C. Raft foundation
D. Machine foundation

Ans. C

116. In singly reinforced beams, steel reinforcement is provided in:

- A. Tensile zone
B. Compressive zone
C. Neutral zone
D. Both tensile and compressive zone

Ans. A

117. In roof trusses, the most frequently used section is:
- A. Two-angle sections placed back to back
B. Two-channel sections placed back to back
C. Two channel sections placed wide apart
D. Four-angle sections

Ans. A

118. A hydraulic jump in a controlled water will be formed above the control, if its original:
- A. Depth is more than critical depth
B. Depth is less than critical depth
C. Depth is equal to critical depth
D. None of these

Ans. A

119. Consider, during compaction:
1. A constant value of air voids is reached at optimum water content and hence the density is maximum at that water content
 2. The air voids increase due to any further increase of water content and hence the density decreases there after
- Of these statement
- A. 1 is true and 2 is false
B. 1 is false and 2 is true
C. Both are true
D. Both are false

Ans. B

120. In the theory of bending, the assumptions that plane sections before bending will remain plane after bending is made to ensure that:
- A. Strain is proportional to the distance from the neutral axis
B. Stress is proportional to the distance from the neutral axis
C. Moment is proportional to the distance from the neutral axis
D. Strain is zero across the cross-section.

Ans. A
