A

ASK1
Civil Engineering

Duration of Test : 2 Hours   **Max. Marks : 100**

Hall Ticket No.

Name of the Candidate :

INSTRUCTIONS

1. This Question Booklet consists of **100** multiple choice objective type questions to be answered in **2** hours.

2. Every question in this booklet has 4 choices marked (A), (B), (C) and (D) for its answer.

3. Each question carries **one** mark. There are no negative marks for wrong answers.

4. This Booklet consists of **16** pages. Any discrepancy or any defect is found, the same may be informed to the Invigilator for replacement of Booklet.

5. Answer all the questions on the OMR Answer Sheet using **Blue/Black ball point pen only.**

6. Before answering the questions on the OMR Answer Sheet, please read the instructions printed on the OMR sheet carefully.

7. OMR Answer Sheet should be handed over to the Invigilator before leaving the Examination Hall.

8. Calculators, Pagers, Mobile Phones, etc., are not allowed into the Examination Hall.

9. No part of the Booklet should be detached under any circumstances.

10. The seal of the Booklet should be opened only after signal/bell is given.


ASK1-A

CIVIL ENGINEERING (CE)
PART – A

1. The slenderness ratio of a column with length $'L'$ and radius of gyration $'r'$ is defined as

   (A) $\dfrac{2L}{r}$　　　(B) $\dfrac{r}{L}$　　　(C) $\dfrac{L}{r}$　　　(D) $\dfrac{r}{2L}$

2. A 60 mm diameter shaft is subjected to a torque of 6 kN-m, $C = 8 \times 10^4$ N/mm^2. The maximum shear stress induced in the shaft will be

   (A) $\dfrac{8000}{9\pi}$　　(B) $\dfrac{4000}{9\pi}$　　(C) $\dfrac{12000}{9\pi}$　　(D) $\dfrac{16000}{9\pi}$

3. Which of the following loads should be applied on a simply supported beam, so that the shear force is constant throughout its span ?
   (A) U.D.L over the entire span
   (B) Two concentrated loads equally spaced in the span.
   (C) A central concentrated load and a U.D.L over the entire span
   (D) A couple anywhere in the span

4. If Poisson's ratio of a material is 0.3, then the ratio of Young's Modulus to bulk modulus is
   (A) 0.6　　　　(B) 0.8　　　　(C) 1.2　　　　(D) 1.4

5. A rectangular bar of cross sectional area A is subjected to an axial tensile load of P. The maximum shear stress will occur on a plane at X° to any normal cross-section. Where X°
   (A) 90°　　　　(B) 270°　　　　(C) 180°　　　　(D) 45°

6. A metal bar of 10 mm diameter when subjected to a pull of 23.5 kN gave an elongation of 0.3 mm on a gauge length of 200 mm. The Young's modulus of elasticity of the metal will nearly be
   (A) 200 kN/mm^2　(B) 300 kN/mm^2　(C) 360 kN/mm^2　(D) 400 kN/mm^2

7. A member *ABCD* is subjected to a force system as shown in the figure. The resistive force in the part *BC* is
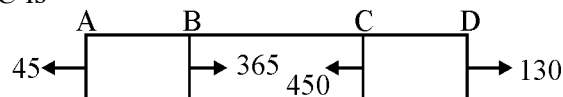
   (A) 365 (compressive)　　　　　　(B) 450 (tensile)
   (C) 85 (compressive)　　　　　　(D) 320 (compressive)

8. Consider the following statements :
   If the planes at right angle carry only shear stress of magnitude q in a certain instance, then the
   (1) Diameter of Mohr's circle would be equal to $2q$
   (2) Center of Mohr's circle would lie at the origin
   (3) Principal stresses are unlike and are of magnitude q each
   (4) Angle between the principal plane and the plane of maximum shear would be 45°
   (A) 1, 2 and 3 only　　　　　　(B) 1, 2, and 4 only
   (C) 3 and 4 only　　　　　　　(D) 1, 2, 3 and 4

9. The principal stresses at a point in a bar are 160 N/mm² (tensile) and 80 N/mm² (compressive) the accompanying maximum shear stress intensity is
(A) 100 N/mm² (B) 110 N/mm² (C) 120 N/mm² (D) 140 N/mm²

10. Fixed end moments at A and B for the fixed beam shown in the figure, subjected to the indicated uniformly varying load, are respectively
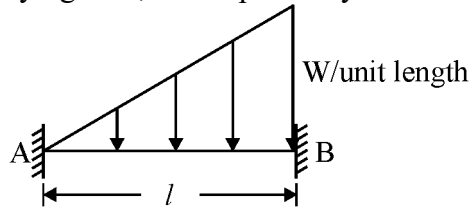
(A) $Wl^2/30$ and $Wl^2/20$ (B) $Wl^2/20$ and $Wl^2/30$
(C) $Wl^2/12$ and $Wl^2/8$ (D) $Wl^2/8$ and $Wl^2/12$

11. A specimen is subjected to pure shear stress regime of intensity τ. The resulting tensile and compressive stresses σ, which occur on planes inclined at 45° to the direction of shear stress would be

(A) τ (B) $\dfrac{\tau}{2}$ (C) $\tau\sqrt{2}$ (D) $\dfrac{\tau}{\sqrt{2}}$

12. The center of the Mohr's Circle for pure shear case lies in
(A) at τ distance from origin (B) at $\dfrac{\tau}{2}$ distance from origin
(C) at origin (D) at $\dfrac{\tau}{\sqrt{2}}$ distance from origin

13. A circular shaft of diameter 'D' is made of a material for which Young's Modulus of Elasticity is 'E' and Poisson's ratio is 'μ'. The ratio of flexural rigidity to torsional rigidity for the shaft is
(A) $(1 + 2\mu)$ (B) $(1 + \mu)$ (C) $(1 - \mu)$ (D) $(1 - 2\mu)$

14. A metal bar of length 90mm and area of cross section 78.5mm² is subjected to a temperature rise of 70 °C. If the bar is fixed at the two ends, then the stress induced in the bar is
(A) 0.55 (B) 0.5 (C) 0.4 (D) 0.45

15. The moment at the free end of a cantilever beam of length 'L' subjected to point load 'P' kN at the end is
(A) PL (B) 0 (C) $(PL)/2$ (D) P

16. The critical section for maximum bending moment in the footing under masonry wall is located at
(A) The middle of wall
(B) The face of the wall
(C) Mid-way between the face and the middle of the wall
(D) A distance equal to the effective depth of footing

17. Consider the following statements for prediction of yield lines in a reinforced concrete slab :

  i.   They represent the axis of rotation.
  ii. They will propagate outward from a point load.
  iii. They are straight lines between two intersecting planes.
  iv. They end at the boundary of the slab or at another yield line.

  Which of the following are correct ?
  (A) i, ii, iii and iv
  (B) i, ii and iii only
  (C) i, ii and iv only
  (D) ii, iii and iv only

18. Which one of the following states falls under the 'Limit state of Serviceability' as per IS-456 ?
  (A) Stability under load
  (B) Loss of equilibrium of a structure
  (C) Floor vibration
  (D) Formation of mechanism

19. According to the concept of Limit State Design as per IS 456 : 2000, the probability of failure of a structure is
  (A) 0.09 to 0.10
  (B) 0.9 to 0.01
  (C) 0.10 to 0.20
  (D) 0.01 to 0.02

20. A column of size 450 mm × 600 mm has unsupported length of 3.0 m and is braced against side sway in both directions. According to IS 456 : 2000, the minimum eccentricities (in mm) with respect to major and minor principal axes are
  (A) 20.0 and 20.0
  (B) 26.0 and 21.0
  (C) 26.0 and 20.0
  (D) 21.0 and 15.0

21. As per IS 456-2000, for the design of reinforced concrete beams, the maximum allowable shear stress (τ_{cmax}) depends on the
  (A) grade of concrete and grade of steel
  (B) grade of steel only
  (C) grade of concrete and percentage of reinforcement
  (D) grade of concrete only

22. The target mean strength f_{cm} for concrete mix design obtained from the characteristic strength f_{ck} and standard deviation σ, as defined in IS:456-2000, is
  (A) $f_{ck} + 1.35\,\sigma$
  (B) $f_{ck} + 1.45\,\sigma$
  (C) $f_{ck} + 1.55\,\sigma$
  (D) $f_{ck} + 1.65\,\sigma$

23. The modulus of elasticity, $E = 5000\,\sqrt{f_{ck}}$ where f_{ck} is the characteristic compressive strength of concrete, specified in IS:456-2000 is based on
  (A) Tangent modulus
  (B) Initial tangent modulus
  (C) Secant modulus
  (D) Chord modulus

24. Group I contains representative stress-strain curves as shown in the figure, while Group II gives the list of materials. Match the stress-strain curves with the corresponding materials.

Group I	Group II
P. Curve J	1. Cement paste
Q. Curve K	2. Coarse aggregate
R. Curve L	3. Concrete

(A) P - 1; Q - 3; R – 2
(B) P - 2; Q - 3; R – 1
(C) P - 3; Q - 1; R – 2
(D) P - 3; Q - 2; R – 1

25. Consider the singly reinforced beam shown in figure below :

At the cross-section *XX,* which of the following statement is TRUE at the limit state ?
(A) The variation of stress is linear and that of strain is non-linear.
(B) The variation of strain is linear and that of stress is non-linear.
(C) The variation of both stress and strain is linear.
(D) The variation of both stress and strain is non-linear.

26. Which one of the following is not used in concrete mix design ?
(A) Degree of quality control of concrete
(B) Workability of concrete
(C) Characteristic compressive strength of concrete at 28 days
(D) Initial setting time of cement

27. The load carrying capacity of a column designed by working stress method is 500 kN. The ultimate collapse load of the column is
(A) 500 kN
(B) 662.5 kN
(C) 750 kN
(D) 1100 kN

28. The maximum percent of moment redistribution allowed in RCC beams is
(A) 10 % (B) 20 % (C) 30 % (D) 40 %

29. Prying forces are
(A) Shearing forces on the bolts because of the joints
(B) Tensile forces due to the flexibility of connected parts
(C) Bending forces on the bolts because of the joints
(D) Forces due to the friction between connected parts

30. A propped cantilever of span L carries a vertical concentrated load at the mid-span. If the plastic moment capacity of the section is M_P, the magnitude of the collapse load is
(A) $\dfrac{8M_P}{L}$ (B) $\dfrac{6M_P}{L}$ (C) $\dfrac{4M_P}{L}$ (D) $\dfrac{2M_P}{L}$

31. Two bolted plates under tension with alternative arrangement of bolt holes are shown in figures 1 and 2. The hole diameter, pitch, and gauge length are d, p and g, respectively.
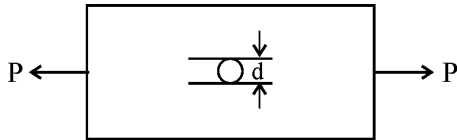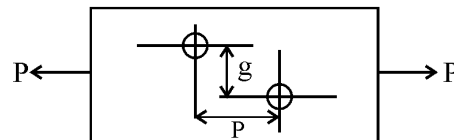

Figure 1   Figure 2

Which one of the following conditions must be ensured to have higher net tensile capacity of configuration shown in Figure 2 than that shown in Figure 1 ?
(A) $p^2 > 2gd$ (B) $p^2 < \sqrt{4gd}$ (C) $p^2 > 4gd$ (D) $p > 4gd$

32. 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 is defined as
(A) $V > 0.6\, V_S$ (B) $V > 0.7\, V_S$ (C) $V > 0.8\, V_S$ (D) $V > 0.9\, V_S$

**33.** Match the information given in Group-I with those in Group-II :

	Group-I		Group-II
P.	Factor to decrease ultimate strength to design strength	1.	Upper bound on ultimate load
Q.	Factor to increase working load to ultimate load for design	2.	Lower bound on ultimate load
R.	Statical method of ultimate load analysis	3.	Material partial safety factor
S.	Kinematical mechanism method of ultimate load analysis	4.	Load factor

(A) P-1; Q-2; R-3; S-4 (B) P-2; Q-1; R-4; S-3
(C) P-3; Q-4; R-2; S-1 (D) P-4; Q-3; R-2; S-1

34. The possible location of the shear centre of the channel section, shown below :
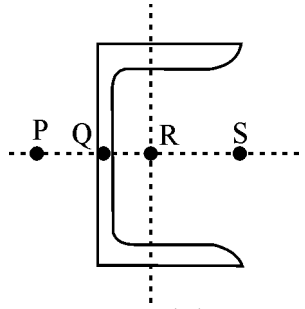
(A) P   (B) Q   (C) R   (D) S

35. At the location of a plastic hinge,
(A) Radius of curvature is infinite.   (B) Curvature is infinite.
(C) Moment is infinite.   (D) Flexural stress is infinite.

36. Consider the following stipulations in designing a laced column :
i. Single lacing systems on opposite planes shall preferably be in the same direction so that one is the shadow of the other.
ii. Lacing bar should be a flat section.
iii. The slenderness ratio of the lacing bars for compression shall not exceed 180.
iv. Laced compression members are to be provided with tie plates at ends.
Which of the following observations is/are correct ?
(A) i only   (B) i and iii   (C) ii and iv   (D) i and iv

37. At a section along the span of a welded plate girder, in which the web is spliced, the bending moment at a section is M. The girder is comprised of top flange, web and bottom flange plates all of equal areas. The share of the bending moment taken by the spliced plates would be
(A) M   (B) M/3   (C) M/7   (D) M/13

38. In an industrial steel building, which of the following elements of a pitched roof primarily resist loads parallel to the ridge ?
(A) Bracings   (B) Purlins   (C) Columns   (D) Trusses

39. If the Euler load for a steel column is 1000 kN and crushing load is 1500 kN, the Rankine load is equal to
(A) 2500 kN   (B) 1500 kN   (C) 1000 kN   (D) 600 kN

40. The effective length of a battened strut of actual length L, effectively held in position at both ends but not restrained in direction, is taken as
(A) L (B) $1.1L$ (C) $1.5L$ (D) $1.8L$

41. The slenderness ratio (as per IS : 800) of a member, carrying compressive loads arising from combined dead loads and imposed loads, should not exceed
(A) 180   (B) 250   (C) 350   (D) 380

42. Localized bearing stress caused by the transmission of compression from the wide flange to the narrow web causes a failure called
(A) Web buckling   (B) Web shear flow
(C) Web bearing   (D) Web crippling

43. Which of the flowing fluids can be classified as non-Newtonian ?
1. Kerosene oil 2. Diesel oil
3. Human blood 4. Toothpaste
5. Water
(A) 1 and 2 (B) 3 and 4 (C) 2 and 5 (D) 1 and 5

44. The space between two parallel plates kept 3mm apart is filled with an oil of dynamic viscosity 0.2 Pa.s. What is the shear stress on the lower fixed plate, if the upper one is moved with a velocity of 1.5m/s ?
(A) 1 (B) 10 (C) 100 (D) 1000

45. What is the ratio of pressure exerted by 10cm of water column to 5cm of oil (relative density = 0.75) ?
(A) 0.75 (B) 2 (C) 2.67 (D) 0.375

46. An equilateral triangle of height h is immersed in water with vertex down (base at water surface). The center of pressure below the water surface is at a depth of
(A) $3h/4$ (B) $h/3$ (C) $2h/3$ (D) $h/2$

47. A steady incompressible, two-dimensional velocity field is given by, $u = x + y + 1$; $v = x - y - 2$. The ratio of the co-ordinates (x, y) at the stagnation point is
(A) 0.33 (B) -0.33 (C) 0.5 (D) -0.5

48. If for a flow, a stream function ψ exists and satisfied Laplace equation, then
(A) the flow is rotational.
(B) the flow is irrotational but does not necessarily satisfy continuity equation.
(C) the flow satisfies continuity equation but not necessarily satisfy the condition for irrotational flow.
(D) the continuity is satisfied and flow is irrotational.

49. A nozzle directs a liquid jet at an angle of elevation of 45°. The hydraulic grade line for the jet
(A) will be horizontal with the centre line of jet.
(B) will be horizontal at the level of energy line.
(C) coincides with the centre line of the jet.
(D) coincides with the energy line.

50. When a steady two-dimensional jet of water impinges on a stationary inclined plate and if the fluid friction is neglected, the resultant force on the plate is
(A) tangential to the surface.
(B) normal to the surface.
(C) in the direction of jet flow.
(D) normal to the direction of jet flow.

51. The relation between Coefficient of contraction (C_c), Coefficient of velocity (C_v) and Coefficient of discharge (C_d) of an orifice is
(A) $C_d = C_v/C_c$ (B) $C_d = C_c/C_v$
(C) $C_d = C_c \cdot C_v$ (D) $C_v = C_d/C_c$

52. A Cipoletti weir has a side slope of
(A) 1V:1H (B) 1V:2H
(C) 1H:4V (D) 1H:2V

53. Consider the specific speed ranges of the following turbines :
1. Francis 2. Kaplan 3. Pelton
The increasing order of specific speed is
(A) 3, 1, 2 (B) 2, 3, 1
(C) 1, 2, 3 (D) 3, 2, 1

54. In all reaction turbines, maximum efficiency is obtained if
(A) the guide vane angle is 90°
(B) the blade angle of the runners is 90° at the inlet
(C) the blade angle of the runners is 90° at the outlet
(D) the angle of the absolute velocity vector at the outlet is 90°

55. The specific speed of a pump has the dimensions of
(A) $L^{3/4} T^{3/2}$ (B) $M^0 L^0 T^0$
(C) $M^{-1/2} L^{1/2} T^{-1/4}$ (D) $L^{3/4} T^{-1/2}$

56. Critical depth at a section of rectangular channel is 1.5 m. The specific energy at that section is
(A) 0.75 m (B) 1.0 m
(C) 1.5 m (D) 2.25 m

57. A mild-slope channel is followed by a steep sloped channel. The profiles of gradually varied flow in the channel are
(A) M_3, S_2 (B) M_3, S_3
(C) M_2, S_2 (D) M_2, S_1

58. The ratio of the volume of voids to the total volume of soil mass is called
(A) water content ratio (B) porosity
(C) void ratio (D) degree of saturation

59. Liquid limit is determined on soil fraction passing through _____ mm sieve.
(A) 0.425 (B) 0.075
(C) 0.002 (D) 4.75

60. Based on plasticity chart, a soil having Liquid limit of 20% and plastic limit of 15% is classified as
(A) CL (B) OL
(C) CL-ML (D) OL-ML

61. A cohesionless soil, in a direct shear test, under a normal stress of 100 kPa yields a maximum shearing resistance of 100 kPa. The value of angle of internal friction is
(A) 45° (B) 30°
(C) 60° (D) 0

62. The liquid limit, plastic limit and shrinkage limit of a fine grained soil are 50, 20 and 10%, respectively. The hydrometer analysis gave the percent clay sized particles as 60%. The activity of the soil is

(A) 5/6   (B) 2/6   (C) 1/6   (D) 3/6

63. The bulk density of a soil sample is 2.2 g/cc. If the water content of the sample is 10%, its dry density will be _____ g/cc.

(A) 2.00   (B) 2.42   (C) 1.20   (D) 2.30

64. In a constant head permeability test, the gradient of flow is 2. The cross-sectional area of the soil sample is 100 cm^2. If 240 cc of water is collected in 2 minutes, the permeability of the soil is

(A) 2 cm/s   (B) 0.01 cm/s   (C) 0.0001 cm/s   (D) 2×10^{-4} cm/s

65. The wet weight of a soil sample of 38.1 mm diameter and 76.2 mm height is 1.80 N. On oven drying at a temperature of 105 °C, the weight of the sample reduced to 1.50 N. The water content of the soil sample is

(A) 83.33%   (B) 16.67%   (C) 20%   (D) 30%

66. The void ratios of a soil sample under consolidation pressures of 10 kPa and 100 kPa are 0.90 and 0.60, respectively. The compression index of the soil is

(A) 0.003   (B) 0.30   (C) 0.03   (D) 3.00

67. Depth of soil investigation (boring) required for construction of 10 m wide footing of a transmission tower is

(A) 5 m   (B) 10 m   (C) 15 m   (D) 100 m

68. A square pile of 25 cm × 25 cm in size and 10 m long is driven in a uniform clay of large depth. The clay has an unconfined compression strength of 100 kPa. Determine the safe frictional resistance of the pile, assuming a factor of safety is 3. Also assume the adhesion factor is 0.6.

(A) 100 kN   (B) 50 kN   (C) 300 kN   (D) 625 kN

69. A square footing of size 1 m, transmits a uniform pressure of 400 kPa to the underlying sandy soil. Determine the vertical stress at a depth of 1 metre below the foundation using the 2:1 method.

(A) 400 kPa   (B) 200 kPa   (C) 100 kPa   (D) 80 kPa

70. For the construction of a shallow foundation dewatering is being done with a gravity well to get a drawdown of 6 m. If the permeability of the aquifer is 1×10^{-6} m/s, then what will be the radius of influence ?

(A) 18 m   (B) 180 m   (C) 60 m   (D) 360 m

PART – B

Direction (Q. 71 to 73) : In each of the following questions a statement has been given followed by four inferences A, B, C and D. Find out the inference that definitely follows from the given statement and mark your answer.

71. 'Most of the students are of outstanding merit.'

    (A) Some of the students are of outstanding merit.

    (B) There are no students who are not of outstanding merit.

    (C) There are some students who are below par.

    (D) All students are of outstanding merit.

72. 'Most of the pens in that shop are expensive.'

    (A) There are no cheap pens in that shop.

    (B) Some of the pens in that shop are expensive.

    (C) There are some cheap pens in that shop.

    (D) Camlin pens in that shop are expensive.

73. 'Ability is poor man's wealth.' This means.

    (A) A poor man is always able.

    (B) A poor man has the ability to earn wealth.

    (C) A wealthy man is always able.

    (D) A poor man can earn wealth if he has ability.

74. If PAINT is coded as 74128 and EXCEL is coded as 93596, then how would you encoded ACCEPT ?

    (A) 455978   (B) 547978   (C) 554978   (D) 455968

75. Find the missing term in the following series :

    240, ___, 120, 40, 10, 2.

    (A) 240   (B) 220   (C) 182   (D) 200

76. In the series 2, 6, 18, 54, …., what will be the 8ᵗʰ term ?
(A) 4370   (B) 4374   (C) 7443   (D) 7434

77. If N is the brother of B, M is the sister of N, J is the brother of P and P is the daughter of B. Who is the uncle of J ?
(A) B   (B) M   (C) P   (D) N

78. A group consists of both boys and girls is 100. ₹ 312 is distributed among the boys and girls such that each boy gets ₹ 3.60 and each girl gets ₹ 2.40. The number of girls are
(A) 88   (B) 40   (C) 60   (D) 65

79. The sum of three consecutive odd numbers is always divisible by
(I) 2   (II) 3   (III) 5   (IV) 6

(A) I and II   (B) Only II   (C) Only I and III   (D) Only II and IV

80. If the L.C.M. of two numbers is 48 and the numbers are in ratio 3:4, then the sum of the numbers is
(A) 28   (B) 32   (C) 40   (D) 64

81. Which one is the same as Coal, Ebony and Soot ?
(A) Blush   (B) Raven   (C) Ash   (D) Rust

Direction : Questions **82** & **83** are based on the following diagram :
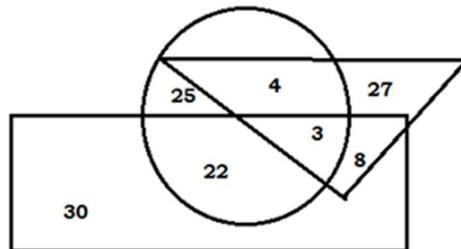
The triangle represents 'Doctors', the circle represents 'Players' and the rectangle represents 'Artists'.

82. How many artists are players ?
(A) 22   (B) 25   (C) 30   (D) 29

83. How many doctors are players but not artists ?
(A) 7   (B) 27   (C) 4   (D) 15

84. How many numbers from 1 to 100 are such each which is divisible by 8 and whose at least one digit is 8 ?

(A) Four   (B) Five   (C) Eight   (D) Six

85. In the following group of letters, one of them is different from the rest. Find out that group.

(A) BQCR   (B) DSEU   (C) FVGW   (D) HXIY

86. What will be the next term in the series: DCXW, FEVU, HGTS, _____

(A) LKPO   (B) ABYZ   (C) JIRQ   (D) LMRS

Direction (Q. 87 to 89): The problems below contain question and two statements of certain data. You have to decide whether the data given in the statements are sufficient for answering the questions. The correct answer is

(A) If statements (I) alone is sufficient but statement (II) alone is not sufficient to answer.

(B) If statements (II) alone is sufficient but statement (I) alone is not sufficient to answer.

(C) If both statements (I) and (II) together are sufficient but neither of the statement alone is sufficient to answer the question.

(D) If each statement alone is sufficient to answer the question.

87. Is cone A is similar to cone B ?

(I) The surface area of A is 9 times the surface area of B.

(II) The volume of A is 9 times the volume of B.

88. Is $x > 1$?

(I) $\sqrt{x + \dfrac{x}{x^2 - 1}} = x \sqrt{\dfrac{x}{x^2 - 1}}$

(II) $x^3 + 1 = 0$

89. The total expenses of two individuals X and Y are ₹ 3,600 and ₹ P respectively. They are represented with the help of a pie-chart. What is P ?

(I) The radius of the circle representing X's total expenditure is 4.2 cm and that of Y's total expenditure is 3.5 cm.

(II) The ratio of the radii of the two circles is 4:1.

90. Three friends A, B and C shared chocolates from a bowl. A took 1/3rd of the chocolates, but returned four to the bowl. B took 1/4th of what was left but returned three chocolates to the bowl. C took half of the remainder but return two back into the bowl. If the bowl has 17 chocolates left, how many chocolates were originally there in the bowl ?

(A) 32   (B) 48   (C) 64   (D) 52

91. There are nine bags of sugar looking alike, eight of which have equal weight and one is slightly heavier. The weighing balance is of unlimited capacity. Using this balance, the minimum number of weighings required to identify the heavier bag is

(A) 5   (B) 4   (C) 3   (D) 2

92. A person starts from a point S, goes South for 4 km and West for 3 km to reach a point T. He then turns to face point S and goes 18 km in that direction. He then goes South for 12 km. How far is he from point S, in which direction should he go to reach point S ?

(A) 5 km, East   (B) 5 km, West   (C) 7 km, East   (D) 7 km, West

93. The number of 3-digit numbers such that the digit 2 is never to the immediate left of 1 is

(A) 881   (B) 880   (C) 891   (D) 890

94. 4 men can finish a work in 6 days, 8 women can finish the same work in 15 days, 10 children can finish the same work in 24 days. How long a team of 1 man, 2 women and 2 children will take to finish the same work ?

(A) 12   (B) 14   (C) 15   (D) 16

95. How many two-digit odd numbers can be composed from the nine digits 1, 2, 3, …,9

(A) 36   (B) 40   (C) 42   (D) 45

96. If the sum of the next two numbers in the following series is 'x', then the value of $log_2 x$ is
is

2, – 4, 8, – 16, 32, – 64, 128, …

(A) 7   (B) 8   (C) 9   (D) 12

97. There is an inner circle and an outer circle around a square as shown in the figure. What is the ratio of area of the outer circle to that of the inner circle ?
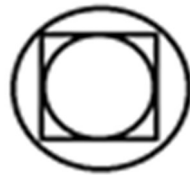
(A) $\sqrt{2}$ (B) 2   (C) $2\sqrt{2}$ (D) $\sqrt{3/2}$

98. In what ratio must rice at ₹ 9.30 per kg be mixed with rice at ₹ 10.80 per kg so that the mixture is worth ₹ 10 per kg ?

(A) 8/7   (B) 7/8   (C) 5/6   (D) 6/5

99. A person bought a shirt at 10% discount and sold it to his friend at a loss of 10%. If his friend paid him ₹ 729 for the shirt, what was the undiscounted price of the shirt ?

(A) ₹ 800   (B) ₹ 911   (C) ₹ 900   (D) ₹ 911.25

100. What is the angle 'x' in the schematic diagram given below ?
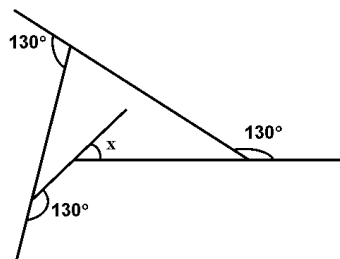
(A) 50°   (B) 60°   (C) 70°   (D) 30°

SPACE FOR ROUGH WORK