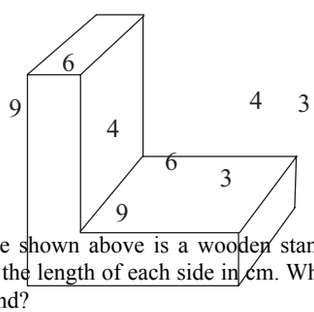
PAPER B

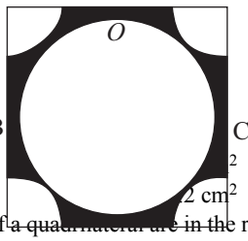
1. Three metallic cubes whose edges are in the ratio 3 : 4 : 5 are melt to form a single cube whose diagonal is 12 3 cm.. What are the lengths of the edges (in cm) of the three cubes ?
   (a) 3, 4, 5 (b) 6, 8, 10
   (c) 9, 12, 15 (d) 1,5,2,2.5
2. If A = cos x cos y, B + sin x sin y, and C = $\sin^2 x + \sin^2 y$, what is the value of $A^2 - B^2$?
   (a) C (b) 1 - C
   (c) 1 + C (d) C - 1
3. If $\tan^2\theta + \cot^2\theta = x$, what is the value of sec θ cosec θ ?
   (a) x (b) x^2
   (c) x (d) $x+2$
4. Consider the following:
   1. $\sin\theta > \cos\theta$, if $0 < \theta < \frac{\pi}{4}$
   2. $\sin\theta < \cos\theta$, if $\frac{\pi}{4} < 0 < \frac{\pi}{-2}$

   Which of the above is/are correct?
   (a) 1 only (b) 2 only
   (c) Both 1 and 2 (d) Neither 1 nor 2
5. A conical vessel is lying on a table with its base downwards. The capacity of the vessel is 500 litre and its vertical height is 150 cm. If 244 litre of water is put in the vessel, then what is the height of the water level in the conical vessel above the table?
   (a) 25 cm (b) 30 cm
   (c) 35 cm (d) 40 cm
6. 4 3 3



   The figure shown above is a wooden stand. The numbers represent the length of each side in cm. What is the volume of the stand?
   (a) 96cm^3 (b) 144 cm^3
   (c) 180 cm^3 (d) 216 cm^3
7. ABCD is a square of side 5 cm. At the four corners, four circular arcs each of radius 1 cm are drawn. A circle of radius 2.5 cm with centre O is drawn inside the square. What is the approximate area of the shaded portion ?

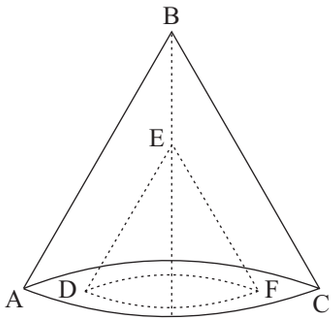
A D



   (a) 1.0 cm^2
   (c) 1.8 cm^2 2 cm^2
8. The angles of a quadrilateral are in the ratio 1:2:3:4. What is the difference between the largest and the smallest angles?
   (a) $\frac{\pi}{5}$ (b) $\frac{2\pi}{5}$
   (c) $\frac{3\pi}{5}$ (d) $\frac{4\pi}{5}$
9. A, B, and C denote the areas of three coterminus faces of a cuboid. If P and S denote the product and sum of dimensions of the cuboid, respectively, which one of the following is correct?
   (a) $PS = A^2 + B^2 + C^2$ (b) $PS = AB + BC + CA$
   (c) $P = S(A+B+C)$ (d) $SP = (A + B + C)^2$
10. O is the centre of a circle having radius 13 units, PQ is a chord of the circle. OR is the perpendicular from O upon chord PQ. If length of the chord is 10 units, what is the length of OR?
    (a) 12 unit (b) 69 unit
    (c) 10 unit (d) 3 unit
11. A rectangle and a parallelogram have equal areas. The base of the parallelogram is 20 cm and the altitude is 6 cm. Which one of the following cannot be the ratio of dimensions of the rectangle ? (The dimensions are of integral values)
    (a) 7 : 5 (b) 40 : 3
    (c) 15 : 2 (d) 30 : 1
12. The area of an isosceles triangle is a when the angle included between the two equal sides is 60°. What will be the area, if the angle included between the two equal sides becomes 120° ? (Keeping the length of equal sides same as before)
    (a) $\frac{a}{2}$ (b) a
    (c) $\frac{3a}{2}$ (d) $2a$
13. The length of a room is $\frac{4}{3}$ times its breadth. The total area of the 4 walls of this room is $\frac{28}{15}$ times the area of the floor of the room. What is the ratio between the height of the room to the length of the room ?
    (a) 2 : 3 (b) 1 : 2
    (c) 2 : 5 (d) 8 : 15

14. A cuboid of size 8 cm × 4 cm × 2 cm is cut into cubes of equal size of 1 cm side. What is the ratio of the surface area of the original cuboid to the surface areas of all the unit cubes so formed ?
(a) 13 : 4 (b) 8 : 3
(c) 7 : 24 (d) 7 : 12

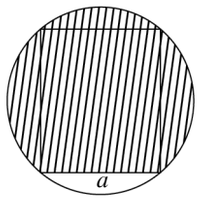
15. There are two identical cubes. Out of one cube, a sphere of maximum volume (V_S) is cut off. Out of the second cube, a cone of maximum value (V_C) is cut such that its base lies on one of the faces of the cube. Which one of the following is correct?
(a) $V_S = V_C$ (b) $V = 2V$
(c) $2V_S = 3V_C$ (d) $3V_S = 4V_C$

16. 

The radius and height of a right solid circular cone (*ABC*) are respectively 6 cm and $2\sqrt{7}$ cm. A coaxial cone (DEF) of radius 3 cm and height $\sqrt{7}$ cm is cut out of the cone as shown above in the figure. What is the whole surface area of the remaining solid thus formed ?
(a) 96π cm^2 (b) 87π cm^2
(c) 60π cm^2 (d) 36π cm^2

17. A right circular solid cone of maximum possible volume is cut off from a solid metallic right circular cylinder of volume *V*. The remaining metal is melt and recast into four identical solid spheres. What is the volume of each sphere?
(a) $\frac{V}{12}$ (b) $\frac{V}{9}$
(c) $\frac{V}{8}$ (d) $\frac{V}{6}$

18. If the height of a cone is decreased by 64%, then by how much percentage should its base radius be increased to maintain the same volume?
(a) 25% (b) 64%
(c) $\frac{200}{3}\%$ (d) $\frac{500}{3}\%$

19. 

A square of side length *a* is inscribed in a circle as shown above in the figure. What is the area of the shaded region ?
(a) $\frac{(3\pi-2)a^2}{4}$ (b) $\frac{(\pi+4)a^2}{8}$
(c) $\frac{(2\pi+7)a^2}{6}$ (d) $\frac{(3\pi+2)a^2}{8}$

20. If ratio of *A* to *B* is 3 : 4, of *B* to *C* is 5 : 7 and of *C* to *D* is 8 : 9, consider the following statements :
1. The ratio of *A* to C is 15 : 28
2. The ratio of *B* to *D* is 2 : 3
3. The ratio of *A* to *D* is 10 : 21
Which of the statements given above are correct ?
(a) 1, 2 and 3 (b) 1 and 2 only
(c) 2 and 3 only (d) 1 and 3 only

21. *p* varies directly as the square of *q* in such a way that, if $p = 1$, then $q = 2$. Now if $q = 6$ what is the value of *p* ?
(a) 3 (b) 9
(c) $\frac{1}{3}$ (d) $\frac{1}{9}$

22. What are the values of *a* for which $3x^5 + 9x^4 - 7x^3 - 5x^2 - 3ax + 3a^2$ is divisible by $x - 1$?
(a) 3, 0 (b) 2, −1
(c) 2, 1 (d) 0, 1

23. What is the remainder when $3x^3 - 2x^2y - 13xy^2 + 10y^3$ is divided by $x - 2y$?
(a) 0 (b) y
(c) $x + y$ (d) $x + 2y$

24. If a + b + c = 0, then what is the value of $(a + b - c)^3 + (c + a - b)^3 + (b + c - a)^3$?
(a) $8(a^3 + b^3 + c^3)$ (b) $a^3 + b^3 + c^3$
(c) $24abc$ (d) $-24abc$

25. When is the expression $x^2 + 3x - 10$ positive only ?
(a) $x \le -5$ (b) $x \ge 2$
(c) $-5 < x < 2$ (d) $x < -5$ or $x > 2$

26. What is the number $\frac{\sqrt{2}+\sqrt{3}}{\sqrt{2}-\sqrt{3}} - 2\sqrt{6}$?
(a) A positive rational number
(b) A positive irrational number
(c) A negative rational number
(d) A negative irrational number

27. A cricketer has a certain average of score for 10 innings. In the 11th innings, he scores 60 runs and thereby his average increases by 3 runs. What is his new average?
(a) 30 (b) 27
(c) 20 (d) 18

28. A number consists of two digits. The sum of the digits is 8. If 54 is subtracted from the number, its digits are interchanged. What is the product of the digits in the number?
(a) 16 (b) 12
(c) 7 (d) 0

29. Given that $\log_{10}2 = 0.3010$, then what is the value of $\log_{10}5$?
(a) 0.7525 (b) 0.6020
(c) 0.6889 (d) 0.6990

30. If $\log_2 x + \log_2 4 = 2$, then what is the value of *x*?
(a) 8 (b) 4
(c) 2 (d) 1

31. What is the greatest number that divides 261, 933 and 1381 leaving remainder 5 in each case?
(a) 128 (b) 64
(c) 32 (d) 16

32. $p=\sqrt{\frac{1-\sin x}{1+\sin x}}, q=\frac{1-\sin x}{\cos x}, r=\frac{\cos x}{1+\sin x}$
Which one of the following is correct?
(a) p = q ≠ r (b) q = r ≠ p
(c) r = p ≠ q (d) p = q = r

33. A tree AC is broken over by wind from B.D. is the point where top of the broken tree touches the ground and BD makes an angle of 45° with the ground. If AD = 10 m, what is the height of the tree ?
(a) 20 m (b) 10 (1+ $\sqrt{2}$) m
(c) $10\sqrt{2}$ m (d) $20\sqrt{2}$ m

34. What is the total number of prime factors in the expression $(4)^{11}\times(14)^{5}\times(11)^{2}$?
(a) 34 (b) 36
(c) 38 (d) 43

35. If p, q and r are unequal natural numbers such that $p^2 = qr$, consider the following:
1. $\frac{p+r}{r}=\frac{q+p}{p}$
2. $\frac{p}{r-p}=\frac{q}{p-q}$
3. $\frac{p+r}{r-p}=\frac{q+p}{p-q}$
Which of the above are correct
(a) 1 and 2 only (b) 2 and 3 only
(c) 1 and 3 only (d) 1, 2 and 3

36. What is the LCM of $\frac{1}{4},\frac{5}{8},\frac{1}{3}$ and $\frac{3}{16}$?
(a) 15 (b) $\frac{1}{48}$
(c) $\frac{5}{4}$ (d) $\frac{1}{4}$

37. The sum of the ages of P and Q is 95 years. Some years ago, P was of the present age of Q. The present age of P is 3 times the age of Q at that time. What are the ages of P and Q, respectively?
(a) 30, 65 years (b) 65, 30 years
(c) 38, 57 years (d) 57, 38 years

38. 10 identical taps fill a tank in 24 min. To fill the tank in 1 h, how many taps are required to be used?
(a) 2 (b) 4
(c) 6 (d) 8

39. A is twice as fast a workman as B, and together they finish a piece of work in 14 days. In how many days can a alone finish the work?
(a) 18 days (b) 21 days
(c) 24 days (d) 27 days

40. A and B are two stations 560 km apart. A train starts from A at 7 a.m. and travels towards B at 80 km/h. Another trains starts from B at 9 am and travels towards A at 120 km/h. When will they meet each other?
(a) 10 am (b) 10.30 am
(c) 11 am (d) 11.30 am

41. Two equal sums were lent out at 9% and 7% simple interest, respectively. The sum of simple interest earned for the two loans at the end of 3 years is Rs. 480. What is each sum equal to?
(a) Rs. 1000 (b) Rs. 2000
(c) Rs. 3000 (d) Rs. 4000

42. What is the compound interest on Rs. 6000 at 10% per annum for one year compounded half-yearly?
(a) Rs. 1260 (b) Rs. 630
(c) Rs. 615 (d) Rs. 600

43. If 20% of x is the same as 30% of y, what percentage of x is y ?
(a) 25% (b) 50%
(c) 200/3% (d) 150%

44. Chetan purchased m kg of rice at the rate of Rs. x per kg and n kg of rice at the rate of Rs. y per kg. He sold the mixture at the rate of Rs. $\frac{(x+y)}{2}$ per kg. Under which one of the following conditions does Chetan get profit?
(a) $m > n, x > y$ (b) $m > n, x < y$
(c) $m = n, x > y$ (d) $m > n, x = y$

45. By selling an item for Rs. 84, a shopkeeper loses 20%. How much will he gain be selling it for Rs. 126?
(a) 3 cm (b) 3.6 cm
(b) 4 cm (d) 4.8 cm

47. In a triangle ABC, AD is the bisector of $\angle BAC$. If AB = 2.8 cm, AC= 4.9 cm and CD = 2.1 cm, then what is the length of BD?
(a) 0.8 m (b) 1.0 cm
(c) 1.2 cm (d) 3.7 cm

48. If in triangles ABC and DEF, $\angle A = \angle E = 37°$, $AB : ED = AC : EF$, and $\angle F = 69°$, then what is the value of $\angle B$?
(a) 69° (b) 74°
(c) 84° (d) 94°

50. If S, T and U are respectively the mid-points of the sides QR, RP and PQ of a triangle PQR, and the area of the triangle PQR is 36 cm^2, then what is the area of the triangle STU?
(a) 24 cm^2 (b) 18 cm^2
(c) 12 cm^2 (d) 9 cm^2

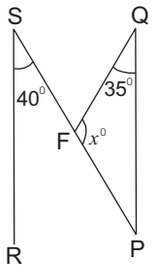
51. If $PQRS$ is a trapezium such that $PQ > RS$ and L, M are the mid-points of the diagonals PR and QS, respectively, then what is LM equal to ?
(a) $\frac{PQ}{2}$ (b) $\frac{RS}{2}$
(c) $\frac{(PQ+RS)}{2}$ (d) $\frac{(PQ-RS)}{2}$

52. In a triangle PQR, perpendicular PS from p to QR meets QR at S. If $PS : QS : RS = 2 : 4 : 1$, then which one of the following is correct?
(a) PQR is an equilateral triangle.
(b) PQR is right angled at P

(c) *PQR* is an isosceles triangle
(d) $PQ = 3\ PR$

53. When does orthocenter of a triangle lie exterior ?
(a) If the triangle is an equilateral triangle.
(b) If the triangle is an obtuse-angled triangle.
(c) If the triangle is an acute-angled triangle
(d) If the triangle is a right-angled triangle

54.

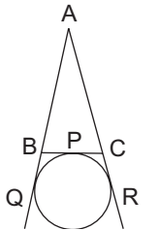


In the figure shown above, $PQ \parallel RS$, $\angle RSF = 40$, $\angle PQF = 35°$ and $\angle QFP = x°$. What is the value of $x°$?
(a) 75° (b) 105°
(c) 135° (d) 140°

55. If an angle of a parallelogram is four-fifth of its adjacent angle, what is the smaller angle of the parallelogram?
(a) 100° (b) 80°
(c) 65° (d) 60°

56. *AB* and *CD* are two chords of a circle such that $AB = 8$ cm, $CD = 10$ cm, and $AB \parallel CD$. If the perpendicular distance between *AB* and *CD* is 2 cm, then what is the radius of the circle equal to ?
(a) $\frac{\left(5\sqrt{17}\right)}{4}$ cm (b) $\frac{\left(4\sqrt{17}\right)}{5}$ cm
(c) $\frac{\left(3\sqrt{17}\right)}{5}$ cm (d) $\sqrt{17}$ cm

57.

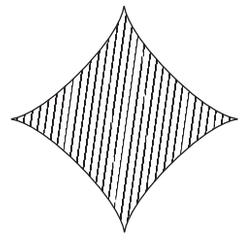


In the figure shown above, a circle touches the side *BC* of a triangle *ABC* at *p*, and *AB* and *AC* produced at *Q* and *R*, respectively. What is *AQ* equal to ?
(a) One- third of the perimeter of the triangle ABC
(b) Half of the perimeter of the triangle *ABC*.
(c) Two- third of the perimeter of the triangle *ABC*.
(d) Three-fourth of the perimeter of the triangle *ABC*

58. A wheel of diameter 100 cm rolls on a plane straight road. What is the locus of the centre of the wheel?
(a) A circle of radius 25 cm.
(b) A straight line parallel to the path of the wheel and 50 cm distant from it.
(c) A circle of radius 50 cm.
(d) A straight line parallel to the path of the wheel and 100 cm distant from it.

59. Two cubes each with 14 cm edge are joined face to face, thus forming a cuboid. What is the surface area of the resulting cuboid?
(a) 3528 cm^2 (b) 2352 cm^2
(c) 1960 cm^2 (d) 1568 cm^2

60.



The quadrants shown in the figure given above are each of diameter 12 cm. What is the area of the shaded portion ?
(a) 12 $(12 - \pi)$ cm^2 (b) 144 $(4 - \pi)$ cm^2
(c) 36π cm^2 (d) 36 $(4 - \pi)$ cm^2

61. If *x, y, z* are the three sums of money such that *y* is simple interest on *x*, and *z* is simple interest on *y* for the same time and at the same rate, then which one of the following is correct?
(a) $y^2 = xz$ (b) $2y = x + z$
(c) $y = x - z$ (d) $y = x + z$

62. A two-digit number is given. If this number is added to a number obtained by reversing the digits of the given number, then the sum is always divisible by which one of the followings numbers?
(a) 7 (b) 9
(c) 10 (d) 11

63. In a college, 500 students study mathematics and 400 students study economics. If 300 students study both the subjects, then what is the total number of students enrolled in the two subjects ?
(a) 600 (b) 800
(b) 900 (d) 1200

64. Consider the following:
1. $\phi \cap \{\phi\} = \phi$
2. $\phi \cap \{\phi\} = \{\phi\}$
3. $\{\phi\} \cap \{\{\phi\}\} = \{\phi\}$

Which of the above is/are correct?
(a) 1 only (b) 2 only
(c) 1 and 3 (d) 2 and 3

65. The height of a tower is *h* and the angle of elevation of the top of the tower is α. On moving a distance *h*/2 towards the tower, the angle of elevation becomes β. What is the value of $\cot\alpha - \cot\beta$?
(a) $\frac{1}{2}$ (b) $\frac{2}{3}$
(c) 1 (d) 2

66. What is the value of *x,* if $\log_{10}\left(\log_{10} x\right)^4 = 4$?

(a) 10^2 (b) 10^6
(c) 10^8 (d) 10^{10}

67. In the month of January, Sachin's income and expenses were Rs. 15000 and Rs. 9000, respectively. His monthly expenses vary directly as the square of his monthly income. What is his income when it just equals his expenses?
(a) Rs. 20600 (b) Rs. 25000
(c) Rs. 27600 (d) Rs. 28600

68. Sanjay sold a bicycle to Salman at 46% profit. Salman spent Rs. 40 on rpairs and sold it to Sunil for Rs. 1500. In this deal, Salman made neither profit nor loss. What is the cost price for Sanjay?
(a) Rs. 900 (b) Rs. 960
(c) Rs. 1000 (d) Rs. 1060

69. What is the value of
$$\frac{\left[2(1-\sin\theta)-\cos^2\theta\right]\times\left[2(1+\sin\theta)\right]-\cos^2\theta}{\cos^4\theta}?$$
(a) -1 (b) 0
(c) 1 (d) 4

70. If $\sec^2\theta-\left(1+\sqrt{3}\right)\tan\theta+\sqrt{3}-1=0$, which one of the following is one of the values of $\tan\theta$?
(a) 0 (b) $\sqrt{3}$
(c) $1-\sqrt{3}$ (d) $1+\sqrt{3}$

71. If sin 35° = α, Sin 70° = β, then which one of the following is correct?
(a) $\alpha>\beta$ (b) $\alpha<\beta$
(c) $\alpha=\beta$ (d) $\beta=2\alpha$

72. Let $0°<\theta<90°$. Which one of the following is correct?
(a) $\frac{\cos\theta}{1+\sin\theta}>1$ (b) $\frac{\sin\theta}{1-\cos\theta}<1$
(c) $\frac{\cos\theta}{1-\sin\theta}>1$ (d) $\frac{\sin\theta}{1+\cos\theta}>1$

73. If x = cot θ + cosec θ, what is the value of $\frac{1+\cos\theta}{1-\cos\theta}$?
(a) x (b) x^2
(c) $\frac{1}{x}$ (d) $\frac{1}{x^2}$

74. What is the value of the expression log tan 10° + log tan 20° + log tan 30° + log tan 40° + log tan 50° + log tan 60° + log tan 70° + log tan 80° ?
(a) 4 (b) 1
(c) 0 (d) –1

75. If tan θ + cot θ = 2, then what is the value of $\tan^7\theta$ + $\cot^7\theta$?
(a) 2^7 (b) 2^{-7}
(c) $\frac{1}{2}$ (d) 2

76. An arc of 60° in one circle is double the arc in a second circle whose radius is three times that of the first circle. What is the degree measure of the arc of the second circle?
(a) 30° (b) 20°
(c) 10° (d) 1°

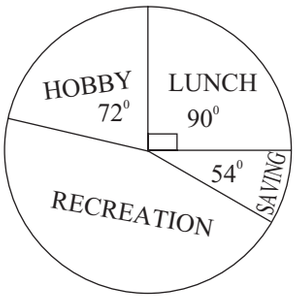
77. If p sin x = q, and x is and acute angle; then what is the value of $\sqrt{p^2-q^2}\tan x$?
(a) p (b) q
(c) pq (d) $\frac{p}{q}$

78. If A= $\sin^2\theta$ + $\cos^4\theta$, then what is the minimum value of A for real values of θ ?
(a) $\frac{1}{2}$ (b) $\frac{3}{4}$
(c) 1 (d) 2

79. If the selling price of 4n items equals the cost price of 5n items, what is the profit percentage?
(a) 20 (b) 24
(c) 25 (d) 30

80. For finding the average speed of a person, which one of the following is most appropriate?
(a) Arithmetic mean (b) Harmonic mean
(c) Median (d) Mode

81. Let x and y by two numbers and their harmonic mean, arithmetic mean and geometric mean be 4, A and G respectively such that $2A + G^2 = 27$. What are the values of x and y, respectively?
(a) 36, $\frac{1}{2}$ (b) 18, 1
(c) 9, 2 (d) 6, 3

82.


The pie-chart given above shows the expenses incurred and saving by a family in a month. What is the percentage of expenses incurred on account of recreation?
(a) $\frac{800}{147}$% (b) 20%
(c) 25% (d) 40%

83. The mean grade of section of 20 students is 66% and that of another section of 15 students is 70%. What is the combined mean grade?
(a) 66.7% (b) 67.7%
(c) 68.7% (d) 69.7%

84. The mean median and mode of given data of score are 21, 23 and 22 respectively. If 3 is added to each score, what are the new values of mean, median and mode, respectively.
(a) 21, 23, 22 (b) 24, 26, 25
(c) 24, 23, 22 (d) Noon of thee

85. Consider the following statements:
The characteristic of a good average is that

1. It should be distinctly defined
2. It should not be based on all the observation of the series.
3. It should not be affected by fluctuations of sampling. Which of the statement given above are correct?

(a) 1 and 2 only (b) 1 and 3 only
(c) 2 and 3 only (d) 1, 2 and 3

Directions The following four (4) items consist of two statements, one labelled as the 'Assertion (A)' and the other as 'Reason (R)'. You are to examine these two statements carefully and select the answers to these items using the codes give below.

Codes:

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

86. **Assertion (A)**: $\text{cosec}\,\theta + \cot\theta = \dfrac{\sin\theta}{1-\cos\theta}$ is a trigonometric identity.
Reason (R): It is satisfied for all values of θ.

87. **Assertion (A):** A triangle can be constructed with lengths of sides being 24 cm, 36 cm and 30 cm.
Reason (R): It is always possible to construct a triangle with side lengths 2 *a,* 2 *b,* and $a + b$.

88. **Assertion (A):** If all sides of a parallelogram touch a circle, the parallelogram is a rhombus.
Reason (R): The tangents to a circle from an exterior point are equal in length.

89. **Assertion (A):** The mean of $x_1, x_2, x_3, x_4, x_5, x_6, x_7, x_8$, and x_9 which are in an arithmetic progression is x_5.
Reason (R): Mean is always the middle-most observation if the data are in a arithmetic progression.

90. For what value of n are $2^n - 1$ and $2^n + 1$ prime ?
(a) 7 (b) 5
(c) 2 (d) 1

91. Which one of the following is correct? The number 71172992355340042332 is :
(a) divisible by 2, but not by 11
(b) divisible by 11, but not by 9
(c) divisible by 9, but not by 11
(d) divisible by 2, 9 and 11

92. If z is HCF of x and y, what is the HCF of x/z and y/z ?
(a) z (b) x
(c) y (d) 1

93. Which one of the following is correct ? The number $\sqrt{14+6\sqrt{5}} + \sqrt{14-6\sqrt{5}}$
(a) is not a rational number
(b) is a rational number ≥ 14
(c) simplifies to 5
(d) simplifies to 6
(take positive root only)

94. Which one of the following is the rational number lying between $\frac{6}{7}$ and $\frac{7}{8}$?
(a) $\frac{3}{4}$ (b) $\frac{99}{112}$
(c) $\frac{95}{112}$ (d) $\frac{97}{112}$

95. The irrational number $\dfrac{7}{3+\sqrt{n}}$ when rationalized becomes $3-\sqrt{n}$. . What is the value of n ?
(a) 1 (b) 2
(c) 3 (d) 7

96. Which of the following are three distinct integers such that the sum of their reciprocals s an integer?
(a) 2, 3, 4 (b) 3, 4, 5
(c) 5, 6, 7 (d) 2, 3, 6

97. If α and β are the roots of $x^2 + p = 0$ where p is a prime then which equation has the roots $1/\alpha$ and $1/\beta$?
(a) $\frac{1}{x^2} + \frac{1}{p} = 0$ (b) $px^2 + 1 = 0$
(c) $px^2 - 1 = 0$ (d) $\frac{1}{x^2} - \frac{1}{p} = 0$

98. If A is a non-empty set and $P(A)$ is its power set, which one of the following is true ?
(a) $\{\phi\} \in P(A)$ (b) $\{A\} \in P(A)$
(c) $A \subseteq P(A)$ (d) $\phi \in P(A)$

99. Let $P = \{x \in N : x \text{ is a multiple of 3 and less than 100}\}$
$Q = \{x \in N : x \text{ is a multiple of 10 and less than 100}\}$
Then which one of the following is true?
(a) $Q \subset P$
(b) $P \cup Q = \{x \in N : x \text{ is a multiple of 30}\}$
(c) $P \cap Q = \phi$
(d) $P \cap Q = \{x \in N : x \text{ is a multiple of 30}\}$

100. What is the value of $(1.929)^3 + (0.071)^3 + (1.929 \times 0.426)$?
(a) 7 (b) 8
(c) 9 (d) 10

ANSWERS

1. (b)	2. (b)	3. (d)	4. (d)	5. (b)	6. (c)	7. (d)	8. (c)	9. (b)	10. (a)
11. (a)	12. (b)	13. (c)	14. (c)	15. (b)	16. (b)	17. (d)	18. (c)	19. (d)	20. (d)
21. (b)	22. (d)	23. (a)	24. (d)	25. (d)	26. (d)	27. (b)	28. (c)	29. (d)	30. (d)
31. (c)	32. (d)	33. (b)	34. (a)	35. (d)	36. (a)	37. (d)	38. (b)	39. (b)	40. (c)
41. (a)	42. (c)	43. (d)	44. (c)	45. (c)	46. (b)	47. (c)	48. (b)	49. (c)	50. (d)
51. (d)	52. (b)	53. (b)	54. (b)	55. (b)	56. (a)	57. (b)	58. (b)	59. (c)	60. (d)
61. (a)	62. (d)	63. (a)	64. (a)	65. (a)	66. (d)	67. (b)	68. (c)	69. (c)	70. (b)
71. (b)	72. (c)	73. (b)	74. (c)	75. (d)	76. (a)	77. (b)	78. (b)	79. (c)	80. (b)
81. (d)	82. (d)	83. (b)	84. (c)	85. (b)	86. (a)	87. (a)	88. (a)	89. (c)	90. (c)
91. (d)	92. (d)	93. (d)	94. (d)	95. (b)	96. (d)	97. (b)	98. (d)	99. (d)	100. (b)

14. Who among the following is the Chairman of the recently constituted National Knowledge Commission ?
(a) Deepak Nayyar (b) Sam Pitroda
(c) R.A. Mashelkar (d) Yash Pal

15. Match List-I (Indian Scientist) with List-II (Area) and select the correct answer using the code given below the Lists :

List-I *(Indian Scientist)*	**List-II** *(Area)*
A. S. K. Vasal	1. Agriculture
B. C. N. R. Rao	2. Medical Science
C. P. Venugopal	3. Physics
D. B. V. Rao	4. Poultry

Code:

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

16. Match List-I (Institution) with List-Il (Location) and select the correct answer using the code given below the Lists :

List-I *(Institution)*	**List-II** *(Location)*
A. Indian Institute of Astrophysics	1. Agra
B. Central Leather Research Institute	2. Chennai
C. National Institute for the Mentally Handicapped	3. Bangalore
D. National Institute of Immunology	4. Secundrabad
	5. New Delhi

Code:

	A	B	C	D
(a)	4	1	5	2
(b)	4	2	1	5
(c)	3	2	4	5
(d)	3	1	5	2

17. Match List-I (Person) with List-II (Area) and select the correct answer using the code given below the Lists:

List-I *(Person)*	**List-II** *(Area)*
A. Vir Sanghvi	1. Dance
B. Zohra Sehgal	2. Sculpture
C. Satish Gujral	3. Film acting
D. Geeta Chandran	4. Journalism

Code:

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

18. Match List-I (Person) with List-II (Organisation) and select the correct answer using the code given below the Lists :

List-I *(Person)*	**List-II** *(Organisation)*
A. Sarthak Behuria	1. Gas Authority of India Ltd.
B. Proshanto Banerjee	2. Indian Oil Corporation Ltd.
C. Venugopal Dhoot	3. Oil and Natural Gas Corporation
D. Subir Raha	4. Videocon Group

Code:

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

19. Consider the following statements:
1. India's GDP growth was higher during the periods Eighth and Ninth Plan than that in 1980s.
2. In India, more than 90% urban households have access to drinking water in their homes.
3. The growth rate of population in India has declined below 2 per cent during the decade of Nineties.

Which of the statements given above is/are correct?
(a) 1 only (b) 2 and 3
(c) 1 and 3 (d) 1, 2 and 3

20. Who is the author of the novel "The Hungry Tide" ?
(a) Amitav Ghosh (b) Arundhati Roy
(c) Shashi Tharoor (d) Ved Mehta

21. Which one of the following has been adopted by World Wild Life Fund as its mascot?
(a) Bear (b) Tiger
(c) Deer (d) Panda

22. Consider the following places:
1. Girnar
2. Mount Abu
3. Ranakpur

Which of the above places is/are the splendid example(s) of the Jain architecture?
(a) 1 and 2 (b) 2 only
(c) 1 and 3 (d) 1, 2 and 3

23. Match List-I (Temple) with List-II (State) and select the correct answer using the code given below the Lists

List-I *(Temple)*	**List-II** *(State)*
A. Chaumukha Jain Temple	1. Maharashtra
B. Jageshwar	2. Rajasthan
C. Kailasanatha	3. Uttaranchal
	4. Uttar Pradesh

Code:

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

24. Match List-I (Dance) with List-Il (State) and select the correct answer using the code given below the Lists

List-I *(Dance)*	**List-II** *(State)*
A. Garia	1. Manipur
B. Garba	2. Gujarat
C. Jhummar	3. Punjab
D. Thabal Chongba	4. Tripura

Code:

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

25. Who is the author of the book "My Presidential Years" ?
(a) S. Radhakrishnan (b) V.V. Giri
(c) R. Venkatraman (d) K. R. Narayanan

26. Match List-I (Person) and List-II (known As) and select the correct answer using the code given below the Lists :

List-I *(Person)*	**List-II** *(Known As)*
A. Ali Mohammad Khusro	1. Agricultural Economist
B. Ashapurna Devi	2. Astrophysicist
C. Jayant V. Narlikar	3. Promoter of Cooperative Milk Sector
D. Verghese Kurian	4. Writer

Code:

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

27. Which of the following tribes are inhabitants of the Andaman and the Nicobar Islands?
1. Onge 2. Jarawa
3. Sentinalese
Select the correct answer using the code given below :
(a) 1 and 2 (b) 2 and 3
(c) 1 and 3 (d) 1, 2 and 3

28. Where is Satish Dhawan Space Centre located?
(a) Chandipur-on-sea (b) Sriharikota
(c) Thiruvananthapuram (d) Thumba

29. With reference to the ancient people of Harappan culture of Indus Valley, which one of the following statements is not correct?
(a) They used spindle whorls for spinning
(b) They practiced boat-making
(c) They used metal money
(d) They used tools and implements of stone.

30. What is the birth place of Vardhamana Mahavir?
(a) Kusinara (b) Kundagrama
(c) Rajgriha (d) Kashi

31. Which one of the following is the correct chronological order of the invasions of north-west India after the fall of the Mauryas ?
(a) Bactrian Greeks – Parthians – Kushans – Hunas
(b) Bactrian Greeks – Kushans – Parthians – Hunas
(c) Parthians – Bactrian Greeks – Hunas – Kushans
(d) Parthians – Hunas – Bactrian Greeks – Kushans

32. Who among the following was the exponent of visistadvaita philosophy?
(a) Vallabhacharya (b) Sankaracharya
(c) Ramanujacharya (d) Madhvacharya

33. Who among the following was a weaver by profession?
(a) Kabir (b) Ramdas
(c) Ravidas (d) Tukaram

34. Why was the Battle of Buxar fought ?
(a) Shah Alam II wanted to chastise the Nawab of Oudh and Nawab of Bengal.
(b) Mir Kasim joined hands with Shah Alam II and. Shuja-ud-daulah against English
(c) Marathas wanted to expel the English from Oudh and free Shah Alam II from confinement
(d) Shuja-ud-daulah wanted the help of Mir Kasim and English to be saved from onslaughts of the Marathas

35. Which among the following was the official language in the court of Mughals in Medieval India?
(a) Persian (b) Pushtu
(c) Arabic (d) Urdu

36. Who among the following current players is not a regular wicket keeper of his country's cricket team?
(a) Geraint Jones (b) Brendon McCullam
(c) Herchell Gibbs (d) Kamran Akmal

37. Who among the following leading women lawn tennis players are from Belgium?
1. Kim Clijsters 2. Justine Henin-Hardenne
3. Anastasia Myskina 4. S. Kuznetsova.
Select the correct answer using the code given below:
(a) 1 and 2 (b) 2 and 3
(c) 1 and 4 (d) 3 and 4

38. Who was the Governor General when the Revolt of 1857 took place?
(a) Lord Hardinge (b) Lord Dalhousie
(c) Lord Canning (d) Lord Elgin

39. The objective of the Sharda Act of 1930 was to discourage the solemnization of marriages of boys and girls respectively under:
(a) 21 years and 18 years (b) 18 years and 16 years
(c) 18 years and 14 years (d) 16 years and 14 years

40. Consider the following statements:
The Government of India Act, 1935 provided for the
1. Establishment of an All-India Federation to be based on the Union of British Indian Provinces and Princely States.
2. Franchise for all the people above 21 years of age.
3. Power to Governors to veto legislative and administrative measures in their provinces.
Which of the statements given above is/are correct?
(a) 1 only (b) 1 and 3
(c) 2 and 3 (d) 1, 2 and 3

41. In Indian history, who among the following is known as "Frontier Gandhi" ?
(a) Maulana Abul Kalam Azad
(b) Khan Abdul Ghaffar Khan
(c) Fakhruddin Ali Ahmed
(d) Khaliquzzaman Chaudhuri

42. Which of the pairs given below is/are correctly matched?
1. Regulating Act : 1773
2. Charter Act : 1784
3. Pitt's India Act : 1793
Select the correct answer using the code given below:
(a) 1 only (b) 1 and 2
(c) 2 and 3 (d) 1, 2 and 3

43. Where was the first university in modem India founded?
(a) Bombay (b) Calcutta
(c) Lahore (d) Madras

44. Who among the following started the A1igarh movement?
(a) Liaquat Ali Khan (b) Sir Sayyad Ahmed Khan
(c) Fazl-i-Hussain (d) Mohammad Ali Jinnah

45. Who prescribed the separate electorates for India on the basis of the Communal Award in August 1932 ?
(a) Clement Attlee (b) Ramsay MacDonald
(c) Stafford Cripps (d) Winston Churchill

46. Match List-I (Event) with List-II (Leader) and select the correct answer using the code given below the Lists :

List-I *(Event)*	**List-II** *(Leader)*
A. Bardoli Saryagraha	1. Lala Lajpat Rai
B. Champaran Satyagraha	2. Vinoba Bhave
C. Bhudan Movement	3. Sardar Patel
D. Ghadar Movement	4. Lala Hardayal
	5. Mahatma Gandhi

Code:

	A	B	C	D
(a)	3	5	2	1
(b)	5	2	3	4
(c)	3	5	2	4
(d)	5	2	3	1

47. With reference to World War-II, consider the following statements :
In 1939, before the Government of India declared India to be at war with Germany
1. The British Government consulted the Indian National Congress and the elected members of the Central Legislature.
2. Mahatma Gandhi opposed the participation of India in the war.
Which of the statements given above is/are correct?
(a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

48. Consider the following statements:
1. The National Anthem of India was adopted by the Constituent Assembly on 24th January, 1950.
2. The first political occasion when the National Song of India was sung was the 1896 Session of the Indian National Congress.
Which of the statements given above is/are correct?
(a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

49. Consider the following statements:
1. The legal transfer of Pondicherry to the Union of India took place in 1954.
2. The then French territories of Chandernagore and Yanam were merged with India by Sardar Patel with police action.
Which of the statements given above is/are correct?
(a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

50. Who was the founder of Sultanate of Gujarat ?
(a) Ahmad Shah (b) Muhammad Shah
(c) Dilawar Khan (d) Zafar Khan

51. Consider the following events during India's freedom struggle:
1. Bardoli Satyagraha
2. Champaran Satyagraha
3. Moplah Rebellion
4. Rebellion of Vizag Agency Tribes
What is the correct chronological sequence of these events?
(a) 2 - 3 - 1 - 4 (b) 2 - 3 - 4 - 1
(c) 3 - 2 - 4 - 1 (d) 3 - 2 - 1 - 4

52. Match List-I (Mineral/Ore) with List-Il (Available At) and select the correct answer using the code given below the Lists:

List-I *(Mineral/Ore)*	**List-II** *(Available At)*
A. Uranium	1. Anantapur
B. Thorium	2. Belgaum
C. Copper	3. Singhbhum
D. Bauxite	4. Travancore

Code:

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

53. Where is the famous Rumtek monastery located?
(a) Arunachal Pradesh (b) Assam
(c) Sikkim (d) Himachal Pradesh

54. Consider the following statements:
1. Tista river flows through Arunachal Pradesh.
2. Tista river falls into the Brahmaputra
Which of the statements given above is/are correct?
(a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

55. Container Corporation of India Limited is an undertaking under which one of the following ministries?
(a) Ministry of Shipping
(b) Ministry of Heavy Industries and Public Enterprises
(c) Ministry of Railways
(d) Ministry of Road Transport and Highways

56. Where is the Lake Superior situated ?
(a) North America (b) South Africa
(c) Australia (d) England

57. From north to south in Himalayas, which one of the following is the correct sequence of the given mountain passes?
(a) Charding La - Muling La - Shipki La
(b) Charding La - Shipki La - Muling La
(c) Shipki La - Charding La - Muling La
(d) Shipki La - Muling La - Charding La

58. Which one of the following pairs is correctly matched?
(a) Bhilwara : Malwa Plateau
(b) Raurkela : Baghelkhand
(c) Kandla : Kathiawar Peninsula
(d) Jagdalpur : Dandakaranya

59. Consider the following pairs:

Water Falls		**States**
1. Jog Falls	:	Karnataka
2. Kaveri Falls	:	Andhra Pradesh
3. Bhaksu Nag	:	Uttaranchal

Which of the above is/are correctly matched ?
(a) 1 only (b) 1 and 2
(c) 2 and 3 (d) 1, 2 and 3

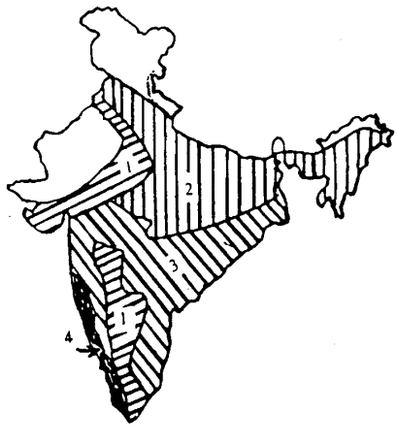
60. Match List-I (Famous Cricket Player) with List-II (Country)

and select the correct answer using the code given below the Lists :

List-I *(Famous Cricket Player)*	**List-1I** *(Country)*
A. Alec Stewart	1. New Zealand
B. David Boon	2. West Indies
C. Martin Crowe	3. England
D. Gordon Greenidge	4. Australia

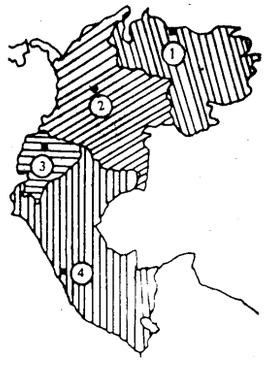
Code:

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

61. 

Consider the map of India given above:
Which one among the climatic regions of India marked 1, 2, 3 and 4 is the 'Humid subtropical' regions?
(a) 1 (b) 2
(c) 3 (d) 4

62. Which one of the following countries is not a member of ASEAN ?
(a) Indonesia (b) South Korea
(c) Thailand (d) Vietnam

63. 

In the map given above, four countries of NW South America region with their capital cities marked as 1, 2, 3 and 4 have been shown. Which mark represents Bogota the capital of Colombia?
(a) 1 (b) 2
(c) 3 (d) 4

64. From north towards south, which one of the following sequences of the given hill ranges is correct?
(a) Kaimur Hills - Ramgarh Hills - Sonpar Hills
(b) Kaimur Hills - Sonpar Hills - Ramgarh Hills
(c) Sonpar Hills - Kaimur Hills - Ramgrah Hills
(d) Sonpar Hills - Ramgarh Hills - Kaimur Hills

65. In which type of forests does Cinchona which gives the drug quinine grow naturally?
(a) Tropical rain forests (b) Temperate deciduous forests
(c) Coinferous forests (d) Mangrove forests

66. Which one of the following pairs is not correctly matched?
(a) Baffin Bay : Canada
(b) Gulf of California : USA
(c) Gulf of Panama : Colombia
(d) Caribbean Sea : Honduras

67. Which one of the following lakes of India is a salt-water lake?
(a) Rewalsar (b) Bhimtal
(c) Nakki (d) Sambhar

68. Match List-I (River) with List-II (Outflow) and select the correct answer using the code given below the Lists :

List-I *(River)*	**List-II** *(Outflow)*
A. Amu Darya	1. Aral Sea
B. Dnieper	2. Bering Sea
C. Ural	3. Black Sea
D. Yukon	4. Caspian Sea

Code:

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

69. Consider the following statements :
1. The Lakshadweep Islands represent coral islands.
2. The Andaman and Nicobar Islands represent detached parts of the continental blocks.

Which of the statements given above is/are correct?
(a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

70. Match List-I (Island) with List-Il (Country) and select the correct answer using the code given below the Lists :

List-I *(Island)*	**List-II** *(Country)*
A. Baffin	1. Canada
B. Celebes	2. Denmark
C. Greenland	3. Indonesia
D. Luzon	4. Philippines

Code:

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

71. Consider the following statements :
In India
1. The duration of the monsoon rainy season goes on decreasing from south to north, and from east to west.
2. The distribution of rainfall received from south-west

monsoons is very greatly governed by the relief or orography.
3. Bulk of the rainfall of the Coromandel Coast is derived from depressions and cyclones.

Which of the statements given above are correct?
(a) 1 and 2 (b) 2 and 3
(c) 1 and 3 (d) 1, 2 and 3

72. Where was the first biosphere reserve set up in India?
(a) Lakshadweep
(b) Aravallis
(c) Andaman and Nicobar Islands
(d) Nilgiris

73. Match List-I (Name of the Island) with List-II (Location) and select the correct answer using the code given below the Lists:

List-I *(Name of the Island)*	**List-II** *(Location)*
A. Falkland	1. Gulf of Mexico
B. Cyprus	2. Mediterranean Sea
C. Socotra	3. Caribbean Sea
D: Jamaica	4. South Atlantic Ocean
	5. Arabian Sea

Code:

	A	B	C	D
(a)	5	3	1	2
(b)	4	2	5	3
(c)	5	2	1	3
(d)	4	3	5	2

74. Which one of the following groups of rivers have their sources near Lake Manasarovar ?
(a) Ganga, Yamuna, Indus
(b) Ganga, Indus, Brahmaputra
(c) Brahmaputra, Satluj, Indus
(d) Brahmaputra, Ganga, Yamuna

75. Which of the following hills is the southernmost high range in India ?
(a) The Nilgiri Hills (b) The Annamalai Hills
(c) The Nallamalai Hills (d) The Cardamom Hills

76. What is the use of choke coil fitted to fluorescent tubes?
(a) It steps down the line voltage
(b) It controls the current to prevent it from continuing to fall
(c) It steps up line voltage
(d) It controls the current to prevent it from continuing to rise

77. Which one of the following is the best nutrient to prevent bleeding of gums, loosening of teeth and poor wound healing?
(a) Ascorbic acid (b) Folic acid
(c) Iodine (d) Zinc

78. After drinking alcohol, a person walks clumsily because the alcohol affects his :
(a) Cerebellum (b) Cerebrum
(c) Medulla oblongata (d) Spinal cord

79. The deficiency of which one of the following vitamin causes delayed clotting of blood and hemorrhage
(a) Vitamin A (b) Vitamin C
(c) Vitamin E (d) Vitamin K

80. Consider the following eye disorders:
1. Cataract 2. Colour blindness
3. Night blindness

Which of the above disorders is/are essentially genetic nature?
(a) 1 and 2 (b) 2 only
(c) 1 and 3 (d) 2 and 3

81. Who of the following invented movie projector?
(a) Alexander Graham Bell
(b) Benjamin Franklin
(c) J.L. Baird
(d) Thomas Edison

82. Which of the following scales of temperature has/have their zero set at absolute zero temperature?
1. Fahrenheit 2. Celsius
3. Kelvin

Select the correct answer using the code given below
(a) 1 and 2 (b) 2 and 3
(c) 3 only (d) 2 only

83. What is the chemical name of baking soda?
(a) Calcium carbonate
(b) Sodium bicarbonate
(c) Potassium permanganate
(d) Sodium chloride

84. Consider the following statements :
Copper rods are generally preferred to iron rods for making lightning conductors because
1. Copper is a better conductor of electricity than iron.
2. Copper is not easily oxidised under atmospheric conditions.
3. Copper is cheaper and easily available as compared to iron.
4. Specific heat of copper is more than that of iron.

Which of the statements given above are correct?
(a) 1 and 2 (b) 1 and 3
(c) 3 and 4 (d) 1, 2 and 3

85. Two children are at the opposite ends of an iron pipe. One strikes an end of the pipe with a stone. Which of the following statements is correct?
(a) Time taken by the sound waves in air and in iron to reach the other end is same
(b) Time taken by the sound waves in iron is more than that taken in air to reach the other end
(c) Time taken by the sound waves in air is more than that taken in iron to reach the other end
(d) The ratio of these times depends on length of the pipe

86. Heavy water is used in nuclear reactors as a :
(a) Solvent (b) Catalyst
(c) Fuel (d) Moderator

87. When ethanol reacts with potassium dichromate, which one of the following is produced ?
(a) Acetic acid (b) Citric acid
(c) Folic acid (d) Malic acid

88. Consider the following statements:
1. Red phosphorus is poisonous whereas white phosphorus is non-poisonous.
2. Red phosphorus has low ignition temperature as compared to white phosphorus.

Which of the statements given above is/are correct?
(a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

89. Cinnabar is an ore of:
(a) Calcium (b) Copper
(c) Lead (d) Mercury

90. What is the phenomenon of ejection of electrons when the surface of metal is irradiated, known as ?
(a) Photoelectric effect (b) Compton effect
(c) Zeeman effect (d) Photovoltaic effect

91. To which one of the following is the average speed of molecules of a gas directly proportional?
(a) Temperature (b) Square of the temperature
(c) Pressure (d) Square root of the absolute temperature

92. What is the chemical name of talc from which the talcum powder is made?
(a) Calcium sulphate (b) Magnesium silicate
(c) Silver nitrate (d) Sodium thiosulphate

93. Which one of the following foods is least harmful for heart patients ?
(a) Chicken (b) Egg
(c) Fish (d) Red meat

94. Consider the following chemical compounds:
1. Aluminium phosphide
2. Endosulfan
3. Malathion
4. Methyl bromide
Which of these are used as fumigants ?
(a) 1, 2, 3 and 4 (b) 2, 3 and 4
(c) 1, 2 and 3 (d) 1 and 4

95. Cellulose is made up of units of:
(a) Fructose (b) Galactose
(c) Glucose (d) Maltose

96. Which one of the following hormones is required for the retention of sodium ions by the human body?
(a) Aldosterone (b) Parathormone
(c) Somatotropin (d) Thyroxin

97. From the evolutionary point of view which one among the following is the most primitive animal in comparison to the other three ?
(a) Roundworm (b) Spider
(c) Prawn (d) Snail

98. Consider the following statements:
1. The Fundamental Duties were added to the Constitution of India during the tenure of Lal Bahadur Shastri as the Prime Minister of India.
2. As per the Constitution of India there are ten Fundamental Duties for every citizen of India.
Which of the statements given above is/are correct?
(a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

99. Till what age can a Judge of a High Court hold the office ?
(a) 58 years (b) 60 years
(c) 62 years (d) 65 years

100. Consider the following statements:
In the Warrant of Precedence of the Government of India
1. Governors of States within their respective state precede the Chief Justice of India
2. Officers of the rank of Lieutenant General or equivalent rank precede the Members of Parliament.
Which of the statements given above is/are correct?
(a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

101. Which one of the following writs is issued by the Supreme Court of India when a person is imprisoned without procedure established by law, to produce him in a court and to submit the cause of imprisonment ?
(a) Certiorari (b) Habeas Corpus
(c) Mandamus (d) Prohibition

102. Consider the following statements :
1. The nomination paper for election to the office of President of India should be subscribed by at least fifty electors as proposers and at least fifty electors as seconders.
2. At present, the President of India is entitled to Rs. 65,000/- per month as salary.
3. Ex-Presidents of India draw a pension of Rs. 3.0 lakhs per year in addition to other facilities.
Which of the statements given above is/are correct?
(a) 1 only (b) 2 and 3
(c) 1 and 3 (d) 1, 2 and 3

103. Consider the following statements:
1. In India, elementary education is now a Fundamental Right for all children in the age group of 6-14 years.
2. The programme of Sarva Shiksha Abhiyan has been launched only in northern and western India.
Which of the statements given above is/are correct?
(a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

104. Which one of the following statements is not correct?
(a) No amendment can be proposed to an Appropriation Bill in either House of Parliament
(b) No money shall be withdrawn from the Consolidated Fund of India except under appropriation made by an Appropriation Act
(c) Unlike other Bills, the Finance Bill needs to be passed by the Lok Sabha only
(d) The Finance Bill can be introduced only on the recommendation of the President of India

105. Consider the following statements:
1. The Vice-President of India, as the Chairman of Rajya Sabha presides over the proceedings of the House, but as the Vice-President as such, no functions have been assigned to him in the Constitution.
2. While acting as the President of India, the Vice-President shall not perform the duties of the office of the Chairman of Rajya Sabha.
Which of the statements given above is/are correct?
(a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

106. Consider the following statements:
1. The Planning Commission decides on how to annually raise resources for financing the Five-Year Plans through taxes and non-tax revenues.
2. The Planning Commission works the plan implementation mechanism in detail.
Which of the statements given above is/are correct?
(a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

107. Which one among the following promoted the concept of Self-help groups (SHGs) for financing the poor?
(a) RBI
(b) NABARD
(c) Union Ministry of Rural Development
(d) Union Ministry of Labour

108. Which of the States are beneficiaries of Sardar Sarovar Project?
(a) Gujarat, Madhya Pradesh, Maharashtra
(b) Gujarat, Rajasthan, Madhya Pradesh and Maharashtra
(c) Gujarat, Karnataka, Uttar Pradesh and Orissa
(d) Maharashtra, Karnataka, Madhya Pradesh and Rajasthan

109. When were the postal services opened to the public in India?
(a) 1837 (b) 1867
(c) 1923 (d) 1948

110. Which of the following services is not included in the All-India Services (AIS) ?
(a) Indian Administrative Service
(b) Indian Police Service
(c) Indian Foreign Service
(d) Indian Forest Service

111. When was a negative growth rate of population recorded in India?
(a) 1911-21 (b) 1921-31
(c) 1931-41 (d) 1941-51

112. What does Gilt-edged market in India mean?
(a) Market of gold and silver
(b) Market of platinum
(c) Market of shares of companies on basis of which the Sensex is calculated
(d) Market of safe securities

113. Which among the following are included in the list a UNESCO World Heritage Centres?
1. Chola Temples
2. Darjeeling Himalayan Railway
3. Bhimbetka
4. Chhatrapati Shivaji Terminus
Select the correct answer using the code given below:
(a) 1, 2, 3, and 4 (b) Only 1, 2 and 3
(c) Only 2,3 and 4 (d) Only 1 and 4

Directions The following 7 (Seven) items consist of two statements, one labelled as the 'Assertion (A)' and the other as 'Reason (R)'. You are to examine these two statements carefully and select the answers to these items using the codes give below:

Codes:
(a) Both A and R are individually true and R is the correct explanations of A
(b) Both A and R are individually 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

114. **Assertion (A):** Higher pressure occurs at lower latitudes as compared to higher latitudes.
Reason (R): The region of lower latitudes receive more heat from solar radiation as compared to the regions of higher latitudes.

115. **Assertion (A):** The mammals we see around do not hibernate.
Reason (R): Unlike other kinds of animals, mammals feed their young ones with milk.

116. **Assertion (A):** Butter softens at room temperature.
Reason (R): Short chain fatty acids cause the melting point to decrease.

117. **Assertion (A):** Malik Kafur conspired with Khizr Khan in murdering Ala-ud-dinKhalji, **Reason (R) :** Malik Kafur was ambitious and tried to establish his influence as the supreme authority in the state.

118. **Assertion (A):** Vira Narasimha deposed the last Saluva ruler of Vijayanagar and seized the throne for himself.
Reason (R): Vira Narasimha wanted to save the kingdom from disintegration due to the revolts of feudatories which could not be controlled by the Saluva ruler.

119. **Assertion (A):** Saturated fats are more reactive compared to unsaturated fats.
Reason (R): Unsaturated fats have double bonds in their molecules.

120. **Assertion (A):** A pure piece of diamond, on burning strongly, changes into CO_2.
Reason (R): Diamond is made up of only carbon atoms.

ANSWERS

1. (b)	2. (c)	3. (d)	4. (c)	5. (a)	6. (d)	7. (b)	8. (c)	9. (b)	10. (a)
11. (b)	12. (d)	13. (a)	14. (b)	15. (b)	16. (c)	17. (c)	18. (b)	19. (c)	20. (a)
21. (d)	22. (d)	23. (b)	24. (c)	25. (c)	26. (b)	27. (d)	28. (b)	29. (c)	30. (b)
31. (a)	32. (a)	33. (a)	34. (b)	35. (a)	36. (c)	37. (a)	38. (c)	39. (c)	40. (b)
41. (b)	42. (a)	43. (b)	44. (b)	45. (b)	46. (c)	47. (b)	48. (c)	49. (a)	50. (d)
51. (c)	52. (c)	53. (c)	54. (b)	55. (c)	56. (a)	57. (a)	58. (d)	59. (a)	60. (d)
61. (d)	62. (b)	63. (b)	64. (c)	65. (a)	66. (c)	67. (d)	68. (a)	69. (a)	70. (c)
71. (d)	72. (d)	73. (b)	74. (c)	75. (d)	76. (b)	77. (a)	78. (a)	79. (d)	80. (c)
81. (c)	82. (c)	83. (b)	84. (a)	85. (c)	86. (d)	87. (a)	88. (d)	89. (d)	90. (a)
91. (d)	92. (b)	93. (c)	94. (d)	95. (c)	96. (a)	97. (a)	98. (d)	99. (c)	100. (a)
101. (b)	102. (c)	103. (a)	104. (c)	105. (c)	106. (c)	107. (b)	108. (b)	109. (a)	110. (d)
111. (a)	112. (d)	113. (a)	114. (c)	115. (b)	116. (a)	117. (d)	118. (c)	119. (d)	120. (a)

PAPER II
ELEMENTARY MATHEMATICS

Time Allowed: Two Hours **Maximum Marks: 100**

1. Consider the following statements in respect of graphical representation of data.
   1. It makes reading more interesting.
   2. It is less time-consuming.
   3. It is easily understandable

   Which of the statement given above are correct?
   (a) 1 and 2 (b) 1 and 3
   (c) 2 and 3 (d) 1, 2 and 3
2. What is the median of the data 1, 2, 2, 3, 3, 4, 4, 4, 4, … up to 36 terms?
   (a) 4.5 (b) 6.0
   (c) 6.5 (d) 18
3. For a given data of 50 sampled observations, there are 30 observations that are less than or equal to the value 5.45. What does the value 5.45 indicate?
   (a) Mean (b) 30^{th} percentile
   (c) 60^{th} percentile (d) 54.5^{th} percentile

Directions The following five (5) items consist of two statements: one labelled as the 'Assertion (A)' and the other as 'Reason (R)'. You are to examine these two statements carefully and select the answers to these items using the code given below.

Code :
(a) Both A and R are individually true, and R is the correct explanation of A.
(b) Both A and R are individually 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.

4. **Assertion (A) :** The rectangle whose perimeter is 20 units will have and area less than or equal to 25 square units.
   Reason (R) : In comparison to all rectangles of given perimeter, a square of the same perimeter has the maximum area.
5. **Assertion (A) :** 3 and 8 are relatively prime.
   8 and 13 are relatively prime.
   3 and 13 are relatively prime.
   Reason (R) : If a and b are relatively prime.
   b and c are relatively prime, then
   a and c must be relatively prime.
6. **Assertion (A) :** Mean is the best measure of central tendency.
   Reason (R) : It is very much affected by the extreme values.
7. **Assertion (A) :** The more than and less than type frequency curves cut each other at median.
   Reason (R) : Point of intersection divides the distribution into two equal parts.
8. **Assertion (A) :** $4x - 5y = 1$ and $-\frac{8}{5}x + 2y = -\frac{2}{5}$ have infinite number of solution.
   Reason (R) : $a_1x + b_1y = c_1$ and $a_2x + b_2y = c_2$ have infinite number of solutions.
   $$\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$$
9. Which one of the following is correct.?
   (a) $\sqrt{2} < \sqrt[3]{3} < \sqrt[6]{6}$ (b) $\sqrt[6]{6} < \sqrt[3]{3} < \sqrt{2}$
   (c) $\sqrt{2} < \sqrt[6]{6} < \sqrt[3]{3}$ (d) $\sqrt[6]{6} < \sqrt{2} < \sqrt[3]{3}$
10. If $y + z$ exceeds x by11 and $z + x$ exceeds y by 7, how much does y exceed x ?
    (a) 1 (b) 2
    (c) 4 (d) Cannot be determined.
11. What is the digit in the unit place of the number represented by $(7^{29}+9^{26})$?
    (a) 5 (b) 6
    (c) 7 (d) 8
12. If $\frac{x^3 + ax^2 + bx + 4}{x^2 + x - 2}$ is a polynomial of degree 1 in x, then what are the values of a, b respectively?
    (a) –1, –4 (b) –1, 4
    (b) 3, –4 (d) 3, 4
13. $(2x - 3y)^3 + (3y - 4z)^3 + (4z - 2x)^3$ can be factorised into which one of the following?
    (a) $(2x + 3y + 4z)(2x - 3y - 4z)$
    (b) $(2x + 3y - 4z)(2x - 3y - 4z)$
    (c) $(2x - 3y)(3y - 4z)(4z - 2x)$
    (d) $6(2x - 3y)(3y - 4z)(2z - x)$
14. If a, b, are natural numbers such that $7a + 5b$ is divisible by 19, which one of the following is divisible by 19?
    (a) $-7a - 5b$ (b) $14a + 2b$
    (c) $9a + 20b$ (d) $13a + 6b$
15. The value of a machine depreciates every year by 4% its value at present is Rs. 6,250. What will be its value after two years?
    (a) Rs. 5,000 (b) Rs. 5,550
    (c) Rs. 5,760 (d) Rs. 6,000
16. Consider the following all real number a, b, and c :
    1. If $a^2 + b^2 + c^2 = ab + bc + ca$, then $a = b = c$
    2. If $a + b + c = 0$, then $a^3 + b^3 + c^3 + 3abc = 0$
    3. If $a + b = c$, then $a^3 + b^3 + c^3 + 3abc = 0$

    Which of the above is/are correct?
    (a) 1 only (b) 2 only
    (c) 1 and 2 (d) 1, 2, and 3
17. What is the HCF of the polynomials
    $n^2(n+1)^2 - 1$, $n^4 - 3n^2 + 1$, $n^4 - (n-1)^2$?
    (a) $n^2 - n - 1$ (b) $n^2 - n + 1$
    (c) $n^2 + n + 1$ (d) $n^2 + n - 1$
18. When $a + b + c + 3a^{1/3}b^{2/3} + 3a^{2/3}b^{1/3}$
    Is divided $a^{1/3} + b^{1/3} + c^{1/3}$, by what is the remainder ?
    (a) $3a$ (b) $3b$
    (c) 0 (d) $c^{2/3}$

19. If $\frac{x}{(b-c)(b+c-2a)} = \frac{y}{(c-a)(c+a-2b)} = \frac{z}{(a-b)(a+b-2c)}$
what is the value of $(x + y + z)$?
(a) $a + b + c$ (b) $a^2 + b^2 + c^2$
(c) 0 (d) 1

20. If $A \cap B = \phi$ then which one of the following holds for $A' \cap B$?
(a) B' (b) A'
(c) A (d) B

21. The minute hand of a clock is 14 cm long. If it moves between 8:00 a.m., what is the area covered by it one the face of the clock?
(a) 512 cm^2 (b) 462 cm^2
(c) 264 cm (d) 196 cm^2

22. A cube having each side of unit length is cut into two parts by a plane through two diagonals of two opposite faces. What is the total surface of each of these parts?
(a) $3 + \sqrt{2}$ square units (b) $2 + \sqrt{3}$ square units
(c) $3\sqrt{2}$ square units (d) 3 square units

23. On increasing the radius of a cylinder by 6 units, the volume increases by x cubic units. On increasing the altitude of the cylinder by 6 units, the volume also increases by x cubic units. It the original altitude is 2 units, what is the original radius?
(a) 2 units (b) 4 units
(c) 6 units (d) 8 units

24. A hollow right circular cylinder with height 8 cm and base radius 7 cm is opened out into a rectangle. What are the length, breadth of the rectangle respectively?
(a) 22 cm, 16 cm (b) 44 cm, 8 cm
(c) 22 cm, 8 cm (d) 44 cm, 16 cm

25. A right circular cone is separated into three solids of curved surface areas S_1, S_2, S_3 by two planes which are parallel to the base and trisect the altitude. What is the value of $S_1 : S_2 : S_3$?
(a) 1 : 1: 1 (b) 1 : 2 : 3
(c) 1 : 3 : 5 (d) 1 : 3 : 6

26. A hemi-spherical bowl has its external diameter as 10 cm. Its thickness is 1 cm. What is the whole surface area of the bowl?
(a) 258 cm^2 (b) 280 cm^2
(c) 284 cm (d) 286 cm^2

27. A circular piece of metal of maximum size is cut out of a square piece and then a square piece of maximum size is cut out of the circular piece. What is the total amount of metal wasted?
(a) $\frac{1}{2}$ times the area of the original square piece.
(b) $\frac{1}{4}$ times the area of the original square piece.
(c) $\frac{1}{2}$ times the area of the circular piece.
(d) $\frac{1}{4}$ times the area of the circular piece.

28. An equilateral triangle is inscribed in a circle and another circle is inscribed in this equilateral triangle. What is the ratio of area of the bigger circle to that of smaller circle?
(a) 2 : 1 (b) 3 : 2
(c) 3 : 1 (d) 4 : 1

29. A tradesman marks two prices on two similar items, one for the cash payment and the other at the credit of 6 months. What will be the ratio between the two prices if the rate of interest is 10% per annum?
(a) 10 : 11 (b) 20 : 21
(c) 40 : 41 (d) 50 : 51

30. Consider the following statements :
1. The product of an integer and a rational number can never be a natural number.
2. The quotient of division of an integer by a rational number can never be an integer.
Which of the statements given above is/are correct?
(a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

31. What value must be given to * so that the number 8 * 76246 is divisible by 11?
(a) 0 (b) 1
(c) 2 (d) 3

32. What is the angle of elevation of sun if a flag-staff of 3m high placed on top of a tower throws a shadow of $\sqrt{3}$ m ?
(a) 30º (b) 45º
(c) 60º (d) Cannot be determined

33. If $\sin A + \sin B + \sin C + \sin D = 4$, what is the value of $\cos A + \cos B + \cos C + \cos D$?
(a) 0 (b) 1
(c) 2 (d) 4

34. If $\sin \theta + \cos \theta = \sqrt{2}$, what is the value of $\sin^6 \theta + \cos^6 \theta$?
(a) $\frac{1}{4}$ (b) $\frac{1}{2}$
(c) 1 (d) 2

35. If $a \sin \theta + b \cos \theta = c$, what is/are the value(s) of $(a \cos \theta - b \sin \theta)$?
(a) $c - a + b$ (b) $c - b + a$
(c) $\pm \sqrt{a^2 + b^2 - c^2}$ (c) $+ \sqrt{c^2 - a^2 - b^2}$

36. Is $\sin A + \cos B = x$ and $\cos A + \sin B = y$ what is the value of $\sin A \cos B + \cos A \sin B$?
(a) $x^2 - y^2 - 2$ (b) $x^2 - y^2 - 2$
(c) $\frac{(x^2 + y^2 - 2)}{2}$ (d) $\frac{(x^2 + y^2 + 2)}{2}$

37. If $0 < \theta < \frac{\pi}{4}$ and $x = \sin \theta - \cos \theta$, which one o the following is correct?
(a) $x = 0$
(b) x is always positive
(c) x is always negative
(d) x may be positive or negative

38. If $x = \cos^2 \theta + \sec^2 \theta$, which one of the following is correct?
(a) $0 < x < 1$ (b) $1 < x < 2$
(c) $x = 2$ (d) $x \geq 2$

39. What is the value of $(\text{cosec } A - \sin A)(\sec A - \cos A)(\tan A + \cot A)$?
(a) 0 (b) 1
(c) 2 (d) 3

40. A person standing on the bank of a river observes that the angle subtended by a tree located on the opposite bank is 60º; when he retires 40 m from the bank, he finds the angle to be 30º. What is the breadth of the river.
(a) 40 m (b) 20 m
(c) 10 m (d) 20 $\sqrt{3}$ m

41. If $\sec\theta = \sqrt{2+\sqrt{2+\sqrt{2+....\infty}}}$
What is the value of cos (1+2 cos θ)?
(a) 0 (b) –1
(c) 1 (d) 2

42. A child of height 4 ft. wants that his shadow should be negligibly small (practically zero). What should be the angle of elevation of sun for such thing to happen?
(a) Angle of elevation of sun should be very small tending to 0º.
(b) Angle of elevation of sun should be nearer to 90º.
(c) Angle of elevation of sun should be 45º.
(d) Angle of elevation of sun should be between 30º and 60º.

43. If $P = \cos x - \sin x$, $q = \frac{1-\sin^3 x}{1-\sin x}, r = \frac{1+\cos^3 x}{1+\cos x}$
What is the value of $p + q + r$?
(a) 0 (b) 1
(c) 2 (d) 3

44. What is the value of $\frac{\sin^3 x + \cos^3 x}{\sin x + \cos x} + \sin x \cos x$?
(a) 0 (b) 8
(b) cos x (d) 1

45. If $\tan(x^2 - 8x + 60)^\circ = \cot(6x - 5)^\circ$, what is one of the values of x ?
(a) 7 (b) 8
(c) 9 (d) 10

46. Given that $\sin A + \left(\frac{1}{\sin A}\right) = \frac{5}{2}$ and a is acute angle, what is the value of A?
(a) $\frac{\pi}{3}$ (b) $\frac{\pi}{4}$
(c) $\frac{\pi}{6}$ (d) $\frac{\pi}{8}$

47. Consider the following :
1. $\cos^6 A + \sin^6 A = 1 - 3\sin^2 A \cos^2 A$
2. $\cos^4 A + \sin^4 A = 1 - 2\sin^2 A \cos^2 A$
3. $\cos^4 A - \sin^4 A = 2\cos^2 A - 1$
Which of the statements given above are correct?
(a) 1 and 2 (b) 2 and 3
(c) 1 and 3 (d) 1, 2 and 3

48. Equilateral triangles BCP, CAQ and ABR are drawn externally on the sides BC, CA, and AB respectively of a scalene triangle ABC.
Consider the following statements:
1. ΔACP and ΔBCQ are similar.
2. ΔBPR and ΔAQR are similar.
Which of the following statement given above is/are correct?
(a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

49. A train takes 18 seconds to pass completely through a station of 162 meters long and 15 seconds to pass completely through another station 120 metres long. With is the length of the train?
(a) 90 metres (b) 100 metres
(c) 110 metres (d) 120 metres

49. A train takes 18 seconds to pass completely through a station of 162 meter long and 15 seconds to pass completely through another station 120 metres long. What is the length of the train?
(a) 90 metres (b) 100 metres
(c) 110 metres (d) 120 metres

50. The simple interest on a sum during a period is 9/25 of the sum. If the rate of interest is R% and the time period is R years, then what is the value of R?
(a) 2 (b) 4
(c) 6 (d) 8

51. To cover a distance of 1 km down the stream a rower takes 10 minutes, while up the stream the rower takes 30 minutes for the same distance. What is the speed of the stream in km/hr?
(a) 1 (b) 2
(c) 3 (d) 4

52. A can do a piece of work in 4 days, B can do the same work in 6 days and C in 12 days. A started the work but had to leave after 1 day. In how many days can both B and C complete the remaining work?
(a) 2 days (b) 3 days
(c) 4 days (d) 6 days

53. A train travels a distance of 300 km at a constant speed. If the speed of the train is increased by 5 km/hr, the journey would have taken 2 hours less. What was the initial speed of the train in km/hr?
(a) 20 (b) 25
(c) 30 (d) 35

54. While dividing a number, the divisor is 8 times the quotient and 4 times the remainder. If the remainder is 12, what is the dividend?
(a) 288 (b) 300
(c) 360 (d) 396

55. Match List-I with List-II and select the correct answer using the code given below the Lists:

List-I	**List-II**
A. $(A - A) - B$	1. ϕ
B. $A - (A - B)$	2. A
C. $B - (A - B)$	3. B
	4. $A \cap B$
	5. $A \cup B$

Code:

	A	B	C		A	B	C
(a)	1	2	3	(b)	3	4	5
(c)	1	4	3	(d)	3	2	5

56. Match List-I with List-II and select the correct answer using the code given below the lists:

List-I	**List-II**
A. $27^{\log_3 2}$	1. 1
B. $49^{\log_7 4}$	2. 2
C. $25^{\log_5 2}$	3. 4
	4. 8
	5. 16

Code:

	A	B	C		A	B	C
(a)	4	1	3	(b)	2	1	4
(c)	2	5	4	(d)	4	5	3

57. If 1.525252… is converted to a fraction, then what is the sum of its numerator and denominator?
(a) 152 (b) 249
(c) 250 (d) 252

58. A vessel can be filled by a pipe in 25 minutes and it can be emptied by a waste pipe in 20 minutes. If both the pipes are opened when the vessel is full, how much is the time taken to empty the vessel?
(a) 5 minutes (b) 45 minutes
(c) 50 minutes (d) 100 minutes

59. What is the compound interest on Rs. 24,000 at the rate of 10% per annum for $1\frac{1}{2}$ years according to six-monthly system?
(a) Rs. 3,873 (b) Rs. 3,783
(c) Rs. 3,600 (d) Rs. 3,200

60. What least number must be added to 6591 to make the sum a perfect square?
(a) 33 (b) 78
(c) 133 (d) 278

61. What is the last digit in the expansion of 3^{100}?
(a) 1 (b) 3
(c) 7 (d) 9

62. A line through the vertex *C* of a quadrilateral *ABCD* parallel to its diagonal *BD* meets *AB* produced in *E*, while a line through *D* parallel to *AB* meets a line through *A* in *F*. If *X, Y, Z* are respectively the areas of the quadrilateral *ABCD*, ΔAED and ΔAEF, then which one of the following is correct?
(a) $X \neq Y \neq Z$ (b) $X = Y \neq Z$
(c) $X \neq Y = Z$ (d) $X = Y = Z$

63. A closed right circular cone contains water up to a height $h/2$ above the base, where h is the height of the cone. To what height does water rise if the cone is inverted?
(a) $\frac{h}{2}$ (b) $\frac{3h}{4}$
(c) $\left(\frac{7}{8}\right)^{1/2} h$ (d) $\left(\frac{7}{8}\right)^{1/3} h$

64. If *V* is volume of cuboid of dimensions *a, b, c* and *S* is its surface area, then what is *S/V* equal to ?
(a) $4\left(\frac{1}{a}+\frac{1}{b}+\frac{1}{c}\right)$ (b) $3\left(\frac{1}{a}+\frac{1}{b}+\frac{1}{c}\right)$
(c) $2\left(\frac{1}{a}+\frac{1}{b}+\frac{1}{c}\right)$ (d) $\left(\frac{1}{a}+\frac{1}{b}+\frac{1}{c}\right)$

65. Three circles of radii r_1, r_2 and r_3 are drawn concentric to each other. The radii r_1, r_2 are such that the area of the circle with radius r_1 is equal to the area between the circles r_2 and r_1. The area between the circles of radii r_3 and r_2 is equal to the area between the circles of radii r_2 and r_1. What is the value of $r_1 : r_2 : r_3$?
(a) $1:\sqrt{2}:\sqrt{3}$ (b) $2:\sqrt{3}:2\sqrt{3}$
(c) 1 : 2 : 3 (d) $1:2\sqrt{2}:3\sqrt{3}$

66. There are 5 cones and 5 cylinders each of base radius *r* and height *r*. What is the number of spheres of radius *r* that can be moulded out of these (assuming each body to be solid)?
(a) 2 (b) 3
(c) 4 (d) 5

67. Two metal cubes, of edge 2 cm each, and one metal cube of edge 3 cm are melted. How many cubes of edge 1 cm each, are needed to be melted so that when combined with the previous melt, a cube, having an edge of minimum integral value, may be moulded?
(a) 2 (b) 4
(c) 6 (d) 21

68. If the sum of the lengths of the diagonals of a rhombus of side 4 cm is 10 cm, then what is its area?
(a) 8 cm^2 (b) 9 cm^2
(c) 10 cm^2 (d) 12 cm^2

69. A right-angled isosceles triangle is inscribed in a circle of radius *r*. What is the area of remaining portion of the circle?
(a) $\frac{\pi r^2}{2}$ (b) $\left(\pi - \frac{1}{2}\right) r^2$
(c) $(\pi - 1) r^2$ (d) $(\pi - 2) r^2$

70. In a right-angled triangle, the square of the hypotenuse is equal to twice the product of the other two sides. What is one of the acute angles of the triangle?
(a) 15° (b) 30°
(c) 45° (d) 60°

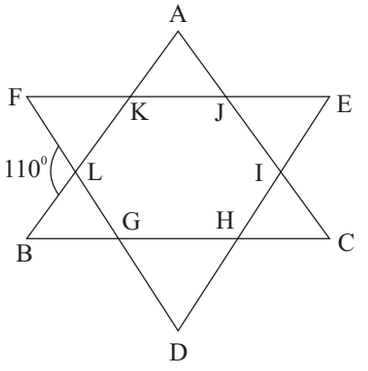
71. How many common tangents can be drawn if two circles on a plane do not intersect?
(a) Zero (b) Two only
(c) Three only (d) Zero or four

72. Which one of the following is correct? The areas of two similar triangles are in the ratio of the squares of the corresponding
(a) medians
(b) altitudes
(c) angle bisector segments
(d) All the above

73. Consider the following statements:
1. To construct the circumcircle of a triangle *ABC*, one has to draw perpendicular bisector of any two sides.
2. To construct the incircle of a triangle *ABC*, one has to draw angle bisectors of any two angles.

Which of the statements given above is/are correct?
(a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

74.



In the figure given above, DEF is an equilateral triangle. If $\angle FLB = 110°$, what is $\angle AKJ$?

(a) 50° (b) 55°
(c) 60° (d) 65°

75. AOB is the diameter of a circle with centre O. C is any point on the circle such that $\angle AOC = 70°$. What is $\angle OBC$?

(a) 20° (b) 35°
(c) 45° (d) 55°

76. Three parallel line l_1, l_2 and l_3 are such that l_2 is between l_1 and l_3. They are cut by two transversals PRE and QSF such that P, Q lie on l_1 ; R, S lie on l_2 and E, F lie on l_3. If $PR = 8$, $RE = 4$ and $QS = 6$, what is the length of SF ?

(a) 12 (b) $\frac{16}{3}$
(c) 3 (d) 4

77. PR and QS are two diameters of a circle intersecting at O. If $PR = 4$ and $QR = 3$, what is the length of PS ?

(a) 2 (b) 3
(c) 4 (d) $\sqrt{5}$

78. In a right-angled triangle PQR, $\angle PQR = 90°$ and S is the mid-point of the hypotenuse PR. If $\angle PQS = 40°$, what is $\angle QSR$?

(a) 60° (b) 80°
(c) 90° (d) 100°

79. $AOBD$ is a quadrilateral such that $\angle AOB = \angle ABD = 90°$ and $\angle DAB = 60°$. If $OA = 3$ cm and $OB = 4$ cm, what is the area of the quadrilateral $AOBD$?

(a) $6 + \frac{5}{2\sqrt{3}}$ cm^2 (b) $6 + \frac{25\sqrt{3}}{2}$ cm^2
(c) $6 + \sqrt{3}$ cm^2 (d) $6 + 25\sqrt{3}$ cm^2

80. In a right-angled triangle ABC, D is the foot of the perpendicular from B on the hypotenuse AC. If $AB = 3$ cm and $BC = 4$ cm, what is the area of the triangle ABD ?

(a) $\frac{72}{25}$ cm^2 (b) $\frac{54}{25}$ cm^2
(c) $\frac{36}{25}$ cm^2 (d) $\frac{63}{25}$ cm^2

81. Which one of the following statements is correct?
If the diagonals of a quadrilateral bisect each other at right angles, then the quadrilateral is

(a) a rhombus but not a square
(b) a square but not a rhombus
(c) either a rhombus or a square
(d) a rectangle but not a square

82. $ABCD$ is a cyclic quadrilateral whose diagonals intersect at O. If $\angle CAB = 25°$ and $\angle BCD = 85°$, what is $\angle CBD$?

(a) 60° (b) 70°
(c) 80° (d) 85°

83. If O is the circumference of a triangle ABC such that $\angle BAC = 58°$, what is $\angle OBC$?

(a) 29° (b) 32°
(c) 48° (d) 58°

84. If the angle included between the sides of lengths 3 cm and 4 cm of a triangle is 60°, then what is the area of the triangle?

(a) $3\sqrt{3}$ cm^2 (b) $4\sqrt{3}$ cm^2
(c) $\frac{3\sqrt{3}}{2}$ cm^2 (d) $2\sqrt{3}$ cm^2

85. If $\sqrt{3x^2 - 4x + 34} + \sqrt{3x^2 - 4x - 11} = 9$ what is the value of the expression $\sqrt{3x^2 - 4x + 34} - \sqrt{3x^2 - 4x - 11}$?

(a) 0 (b) 3
(c) 5 (d) 9

86. For what values of p and q, where p, q are real numbers and $p \neq 0$, does the equation $3x - 5 + q = px + 1$ have solution?

(a) For all p and q (b) $p = 3$, $q \neq 6$
(c) $p \neq 3$ for any q (d) $q \neq 6$ for any p

87. If $a + b + c = 0$ then what is the value of $a^4 + b^4 + c^4 - 2a^2b^2 - 2b^2c^2 - 2c^2a^2$?

(a) 0 (b) 1
(c) –1 (d) $\frac{1}{2}$

88. For what value of m will the expression $3x^3 + mx^2 + 4x - 4m$ be divisible by $(x + 2)$?

(a) – 4 (b) 0
(c) For any value of m (d) No such value of m exists

89. If $x^3 + px + q$ and $x^3 + qx + p$ have a common factor which one of the following is correct?

(a) $p + q = 0$ (b) $p + q - 1 = 0$
(c) $p + q + 1 = 0$ (d) $p - q + 1 = 0$

90. What are the square roots of $\left(a - \frac{1}{a}\right)^2 - 4\left(a + \frac{1}{a}\right) + 8$?

(a) $\pm\left(a + \frac{1}{a} - 2\right)$ (b) $\pm\left(a + \frac{1}{a} + 2\right)$
(c) $\pm\left(a - \frac{1}{a} - 2\right)$ (d) $\pm\left(a - \frac{1}{a} + 2\right)$

91. If $\sqrt{a} = \sqrt{b} + \sqrt{c}$, what is the simplified value of $\left(\frac{a + b - c}{a - b + c}\right)^2$?

(a) 1 (b) $\frac{b}{c}$
(c) $\frac{c}{a}$ (d) $\frac{a}{b}$

92. If $\sqrt{16 - 6\sqrt{7}} = a + b\sqrt{7}$, what can be the value of b ?

(a) – 2 (b) $-\frac{3}{2}$
(c) – 1 (d) $-\frac{1}{2}$

93. If $x^2 + xy = 40$ and $y^2 + xy = 60$, what are the values of $x + y$?

(a) ± 15 (b) ± 5
(c) ± 10 (d) $\pm\sqrt{10}$

94. If $\frac{b}{y} + \frac{z}{c} = 1$ and $\frac{c}{z} + \frac{x}{a} = 1$,then which one of the following corresponds to the value of the expression $\frac{a}{x} + \frac{y}{b}$?

(a) 0 (b) 1
(c) – 1 (d) 2

95. If $x^2 = by + cz$, $y^2 = cz + ax$, $z^2 = ax + by$; then what is the expression $\frac{a}{x + a} + \frac{b}{y + b} + \frac{c}{z + c}$ equal to ?

(a) $\frac{1}{x} + \frac{1}{y} + \frac{1}{z}$ (b) 1
(c) – 1 (d) 0

96. If the roots of the equation $x^2 + x + 1 = 0$ are in the ratio of m : n, then which one of the following relations holds?

(a) $m + n + 1 = 0$ (b) $\frac{m}{n} + \frac{n}{m} + 1 = 0$

(c) $\sqrt{m} + \sqrt{n} + 1 = 0$ (d) $\sqrt{\frac{m}{n}} + \sqrt{\frac{n}{m}} + 1 = 0$

97. If $\frac{1}{\log_x 3} - \log_3 5 = 1$ what is the value of x ?

(a) 1 (b) 3

(c) 5 (d) 15

98. If the equation $ax^2 + bx + c = 0$ are equal in magnitude but opposite in sign, then which one of the following is correct ?

(a) $a = 0$ (b) $b = 0$

(c) $c = 0$ (d) $b = 0, c \neq 0, a \neq 0$

99. The sum of the digits in a two-digit number is 10. If 18 is subtracted from the number, the result is the number with the digits reversed. What is the number ?

(a) 46 (b) 64

(c) 73 (d) 37

100. What is the value of $\left(1 + x^{a-b}\right)^{-1} + \left(1 + x^{b-a}\right)^{-1}$?

(a) – 1 (b) 1

(c) $a - b$ (d) 0

ANSWERS

1. (d)	2. (b)	3. (c)	4. (b)	5. (c)	6. (d)	7. (a)	8. (a)	9. (d)	10. (b)
11. (d)	12. (a)	13. (d)	14. (c)	15. (c)	16. (c)	17. (d)	18. (c)	19. (c)	20. (d)
21. (b)	22. (b)	23. (c)	24. (b)	25. (b)	26. (d)	27. (a)	28. (d)	29. (b)	30. (d)
31. (c)	32. (d)	33. (a)	34. (a)	35. (c)	36. (c)	37. (c)	38. (d)	39. (b)	40. (b)
41. (c)	42. (b)	43. (d)	44. (d)	45. (a)	46. (c)	47. (d)	48. (a)	49. (a)	50. (c)
51. (b)	52.(b)	53. (b)	54. (b)	55. (c)	56. (d)	57. (c)	58. (d)	59. (b)	60. (c)
61. (a)	62. (c)	63. (d)	64. (c)	65. (a)	66. (d)	67. (d)	68. (*)	69. (c)	70. (c)
71. (d)	72. (d)	73. (c)	74. (a)	75. (b)	76. (c)	77. (b)	78. (b)	79. (b)	80. (b)
81. (c)	82. (b)	83. (b)	84. (a)	85. (c)	86. (c)	87. (a)	88. (c)	89. (d)	90. (a)
91. (b)	92. (c)	93. (c)	94. (b)	95. (b)	96. (b)	97. (d)	98. (d)	99. (b)	100. (b)

SEPTEMBER 2004

PAPER I
PART A — ENGLISH

Time Allowed: Two Hours **Maximum Marks: 100**

ORDERING OF WORDS IN A SENTENCE

Directions (for the following 15 items) In the following items some parts of the sentence have been jumbled up. You are required to re-arrange the parts which are labeled P, Q, R and S to produce the correct sentence. Choose the proper sequence and mark in your Answer Sheet accordingly.

Example 'Z' has been solved accordingly.

Z. it is well known that the effect (P) is very bad (Q) on children (R) of cinema (S)

Which one of the following is the correct sequence?

(a) P S R Q (b) S P Q R

(c) S R P Q (d) Q S R P

Explanation:

The proper way of writing the sentence is 'It is well known that the effect of cinema on children is very bad.' This is indicated by the sequence P S R Q and so (a) is the correct answer.

1. The Portuguese, had a great talent (P) and also for choosing the right place to build (Q) for building houses (R) who arrived in Goa 400 years ago (S)

Which one of the following is the correct sequence?

(a) R P S Q (b) S Q R P

(c) R Q S P (d) S P R Q

2. In life some rules are (P) as in business (Q) they seem almost instinctive (R) learnt so early that (S)

Which is of the following is the correct sequence?

(a) R S P Q (b) Q P S R

(c) R P S Q (d) Q S P R

3. Right from used as a measure of time and have (P) pre-historic times the phases (Q) formed the basis of the earliest calendars (R) of the Moon have been (S)

Which one of the following is the correct sequence?

(a) Q R P S (b) P S Q R

(c) Q S P R (d) P R Q S

4. Today, in the country (P) offers the best connectivity, (Q) both Kerala, among all states (R) in terms of telecom and datacom (S)

Which one of the following is the correct sequence ?

(a) R P Q S (b) S Q P R

(c) R Q P S (d) S P Q R

5. To maximize even before signing the joint venture agree-(P) ment the parties to a joint venture agreement (Q) the chances of success should jointly prepare a (R) detailed business plan (S)

Which one of the following is the correct sequence?

(a) P Q S R (b) R S Q P

(c) R Q S P (d) P S Q R

6. In recent years primarily because purchasing managers (P) now has grown more intense (Q) exert much more influence (R) over suppliers price competition in most industries (S)

Which one of the following is 'the correct sequence ?

(a) P R S Q (b) S Q P R

(c) P Q S R (d) S R P Q

7. Another feature of nature where even juniors (P) team-functioning besides (Q) are encouraged to peak their minds (R) cordiality among seniors, is its democratic (S)

Which one of the following is the correct sequence?

(a) P S Q R (b) Q R P S

(c) P R Q S (d) Q S P R

8. Affluent families in return for doing some small job (P) them come up in life (Q) monetary help and helped (R) took in those in need of (S)

Which one of the following is the correct sequence?

(a) S R Q P (b) P Q R S

(c) S Q R P (d) P R Q S

9. Summer vacation that their children learn something (P) worthwhile who are able to provide services for anxious (Q) parents who want to make sure (R) has become big business (S) for those

Which one of the following is the correct sequence?
(a) P R Q S (b) S Q R P
(c) P Q R S (d) S R Q P

10. Each culture flourishes when it comes (P) own tradition and (Q) yet draws strength from its (R) into contact with others (S)
Which one of the following is the correct sequence?
(a) R Q P S (b) S P Q R
(c) R P Q S (d) S Q P R

11. Making had formed from the receding tide (P) I noticed a man fishing in (Q) my way to a favourite fishing spot (R) a very small pool of water that (S)
Which one of the following is the correct sequence?
(a) S P R Q (b) R Q S P
(c) S Q R P (d) R P S Q

12. Around the world painful terminal disease (P) the question of humane death (Q) people are wrestling with (R) especially in the face of (S)
Which one for the following is the correct sequence?
(a) R S Q P (b) P Q S R
(c) R Q S P (d) P S Q R

13. For thousands of years one of the most important fruits (P) the strange fruit of this bush (Q) of the Mediterranean region (R) has been regarded as (S)
Which one of the following is the correct sequence?
(a) P R Q S (b) Q S P R
(c) P S Q R (d) Q R P S

14. Everyone knows that it is difficult (P) to speak more politely (Q) to go to the manager (R) and tell him that he ought (S)
Which one of the following is the correct sequence?
(a) Q S R P (b) P R S Q
(c) Q R S P (d) P S R Q

15. The Great Powers are engaged in spite of common (P) knowledge in arming themselves to the teeth (Q) total destruction of the human race (R) that another war will mean (S)
Which one of the following is the correct sequence?
(a) Q R S P (b) S P Q R
(c) Q P S R (d) S R Q P

SYNONYMS

Directions (For the following 15 items) Each of the following fifteen items consists of a word in capital letters. Followed by four words or group of words. Select the word or group of words that is most **similar** in meaning to the word in capital letters.

16. SOLITUDE
(a) Musical composition (b) Aloneness
(c) True statement (d) Single-mindedness

17. SULLEN
(a) Smooth (b) Oppressive
(c) Dirty (d) Resentful

18. PROPITIOUS
(a) Favourable (b) Clean
(c) Nearby (d) Patriotic

19. RECTITUDE
(a) Duplication (b) Integrity
(c) Rectification (d) Recovery

20. ANOMALY
(a) Annihilation (b) Anarchy
(c) Disturbance (d) Deviation

21. VALOUR
(a) Wandering (b) Brightness
(c) Bravery (d) Affluence

22. MERCURIAL
(a) Studious (b) Sprightly
(c) Hot-tempered (d) Handsome

23. FACILE
(a) Arduous (b) Fashionable
(c) Humorous (d) Easy

24. INCONGRUOUS
(a) Inconceivable (b) Inevitable
(c) Inconsistent (d) Incontrovertible

25. CONVALESCENCE
(a) Continued hostile attitude
(b) Gradual recovery of health
(c) An assemblage of people
(d) Summary

26. RANCOUR
(a) Bitterness (b) Energy
(c) Fatigue (d) Tolerance

27. SEDATE
(a) Long-delayed (b) Offensive
(c) Secular (d) Staid

28. TEDIUM
(a) Boredom (b) Magnitude
(c) Joke (d) Supplementary

29. OBDURATE
(a) Shaky (b) Stubborn
(c) Hostile (d) Boring

30. PREPOSSESSING
(a) Economical (b) Pleasing
(c) Selfish (d) Wise

ANTONYMS

Directions (For the following 15 items) Each of the following **Fifteen** items consist of a word in capital/letters. followed by four words or groups of words. Select the word or group of words that is furthest in meaning to the word in capital letters.

31. GARRULOUS
    (a) Soft-spoken (b) Reticent
    (c) Peaceful (d) Kind
32. FORBEARANCE
    (a) Patience (b) Self –control
    (c) Intolerance (d) Preference
33. PREDILECTION
    (a) Confusion (b) Detestation
    (c) Abnormality (d) Desperateness
34. RELENTLESS
    (a) Merciless (b) Yielding
    (c) Monotonous (d) Incisive
35. TRANSIENT
    (a) Alien (b) Tragic
    (c) Brief (d) Permanent
36. SYNCHRONOUS
    (a) Not in working order (b) Not in phase
    (c) Without problems (d) Without permission
37. VEXATION
    (a) Patience (b) Pleasantness
    (c) Displeasure (d) Dislike
38. UNDERMINE
    (a) Ensnare (b) Mollify
    (c) Terminate (d) Bolster
39. OVERBEARING
    (a) Thrifty (b) Timid
    (c) Cautious (d) Futuristic
40. BANALITY
    (a) Detailed analysis
    (b) Novel expression
    (c) Unrehearsed statement
    (d) Brief account
41. VANITY
    (a) Arrogance (b) Bluster
    (c) Modesty (d) Disrepute
42. APATHY
    (a) Cruelty (b) Passion
    (c) Tactfulness (d) Hostility
43. PRODIGALITY
    (a) Unselfishness (b) Unresponsiveness
    (e) In excitability (d) Miserliness
44. CONFORMITY
    (a) Doubtful (b) Variance
    (c) Par excellence (d) Unorthodox
45. PALTRY
    (a) Obsolete (b) Cautious
    (c) Random (d) Plentiful

ORDERING OF SENTENCES

Directions (For the following 10 items) In the following items each passage consists of six sentences. The first and the final sentence are given in the beginning. The middle of the sentences in each have been removed and jumbled up. These are labelled P, Q, R and S. You are required to find out the proper sequence of the four sentences and mark accordingly on the Answer Sheet. Example 'X' has been solved for you.

X. S_1: There was a boy named Jack.
S_6: At last she turned him out of the house.
P: So the mother asked him to find work.
Q: They were very poor.
R: He lived with his mother.
S: But Jack refused to work.
Which one of the following is the correct sequence?
(a) R Q P S (b) P Q R S
(c) Q P R S (d) R P S Q

Explanation

The proper sequence in this example is R Q P S which is marked (a). Therefore, (a) is the correct answer.

46. S_1: The hill town of Gorkha is the ancestral home of the Shah dynasty. which rules Nepal today.
S_6: To this day, the British and Indian armies maintain Gorkha regiments.
P: And thus grew the legend in the army: "Anyone who says he is not afraid is either a liar or a Gorkha."
Q: It was from here that Prithvi Narayan Shah and his legendary Gorkhali fighters started their conquest of the country's various tiny principalities and unified them into a single nation.
R: So impressed were the British that over 2,00,000 Grokhas were recruited by them to fight in the two World Wars.
S: The Gorkhas made their presence felt in battles against the British in India in the 19th century.
Which one of the following is the correct sequence?
(a) Q R S P (b) P S R Q
(c) Q S R P (d) P R S Q
47. S_1: It was Mother Teresa who once said that people may not be hungry for bread, but are hungry for love and recognition.
S_6: You don't lose any money or time by taking interest in others.
P: Be he or she, a child or an adult, a white collar or a blue collar worker, a young housewife or a granny, everyone looks forward to a word of appreciation or cheer.
Q: Mother was only citing a universal truth.
R: You don't lose anything by complimenting her, but it matters a lot to her.
S: If you just tell a housewife, 'How wonderful is the curry you have made,' a winsome smile and bright face greets you.

Which one of the following is the correct sequence ?
(a) S R Q P (b) Q P S R
(c) Q R S P (d) S P Q R

48. S_1: The Kalka-Shimla Railway Line boasts of a rich history, in its 100 years of operation.
S_6: A breathtaking journey through the lower Himalayan range, with a clear view of the hills and the surrounding abundance of nature.
P: His conviction was so strong that even the British followed the line that Bhalku's Deity had predicted and the track built accordingly.
Q: The result ?
R: Like the story of Bhalku, a track worker, whose Deity revealed to him in his dreams, the line that the track would be built on!
S: Covering 96.54 km, the track rises from an altitude of 640 metres from Kalka to 2060 meters at Shimla, zigzagging through a total of 103 tunnels and crossing more than 800 bridges.
Which one of the following is the correct sequence?
(a) R P S Q (b) S Q R P
(c) R Q S P (d) S P R Q

49. S_1: Ordinance Factories are situated in remote areas of the country.
S_6: Their existence: is not merely existing the workforce but also contributing enormously to the socioeconomic development of the region.
P: The factories are well equipped with modern amenities.
Q: The setting up of factories with sound infrastructure in such underdeveloped areas has not only initiated rapid industrialization, but also generated substantial direct and indirect employment opportunities.
R: They have their own hospitals, schools, market complexes and recreational facilities.
S: All factories undertake welfare schemes like organising health camps and awareness programmes, education to children and social forestry.
Which one of the following is the correct sequence?
(a) P S Q R (b) Q R P S
(c) P R Q S (d) Q S PR

50. S_1: It was one of the biggest affirmations of wealth made during the last century.
S_6: This is how 40,000 havelis came to be constructed in the Shekawati belt of Rajasthan during a brief span of 30 years at the start of the 20th century.
P: And what better way to make such an announcement than by building a home akin to a palace?
Q: Nor were these houses small enough to be mistaken for the common man.
R: Shrewd businessmen that they were, they refused to build palaces as that would bring them in conflict with their Rajput bosses.
S: An entire generation of Marwari businessmen who had struck big-time riches in the bustling metros of colonial India wanted to announce their newly-gotten wealth to their relatives back home.
Which one of the following is the correct sequence?
(a) S R P Q (b) Q P R S
(c) S P R Q (d) Q R P S

51. S_1: The neem tree has been revered by Indians since time immemorial.
S_6: As a result, it is blessed with the property to cure all ailments.
P: Many by-products of neem can be effectively used for treating various health problems.
Q: Wherever the Indians migrated, they made efforts to introduce the plant.
R: According to mythology, when Indra was carrying the urn containing amrit to heaven on his white elephant, some of the amrit fell on the neem tree.
S: It provides plentiful shade all the year round and its presence keeps several types of insects away.
Which one of the following is the correct sequence?
(a) Q S P R (b) P S Q R
(c) Q R P S (d) P R Q S

52. S_1: Most people don't think of cultural shifts when they move to a new country.
S_6: If you give them a patient hearing, they will treat you with respect and there is a possibility that they will give importance to family values.
P: It's quite natural for your children to covet the same things that you wanted and even look for a social life within their age groups.
Q: If you oppose them, they will resent you.
R: When you decided to move to the US, obviously money and material goods figured high on your priority list.
S: When that happens, you will lose them completely.
Which one of the following is the correct sequence?
(a) S P Q R (b) R Q P S
(c) S Q P R (d) R P Q S

53. S_1: On a sunny autumn morning, my wife and I visited the Honshu tunnel site in Japan.
S_6: My wife's disappointment was tempered by a chance to stroll through the bright town.
P: "Although we are building for tomorrow, our superstitions are yesterday's-the men say that a woman in the tunnel would bring bad luck."
Q: But our guide brought only a single set of overalls and one hard hat.
R: "You must forgive us," he said with exquisite politeness.
S: We had assumed that we would both be allowed down into the tunnel.
Which one of the following is the correct sequence?
(a) P R Q S (b) S Q R P
(c) P Q R S (d) S R Q P

54. S_1: The rate at which the world population is increasing gives the impression of an explosion.
S_6: Diseases. for which no cure or prevention was known, caused terrible mortality, and the social disruption because of wars lowered the birth rate.
P: How did this situation come about?
Q: For centuries before the Industrial Revolution, human population was held in check by natural disasters over which they had no control.
R: This phenomenal increase is still continuing and estimates predict that the world population will be doubled by the year 2010.
S: Starvation followed when crops failed.
Which one of the following is the correct sequence?
(a) R P Q S (b) Q S R P
(c) R S Q P (d) Q P R S

55. S_1: In a study made recently, 28,000 accidents were recorded among a group of 60,000 workers.
S_6: The study points out that this is a fourfold increase in the rate of accidents involving the same number of workmen in 2002-2003 as compared to that of 1998-1999. It recommends the reduction of the number of hours of work.
P: The introduction of machines is not at all responsible for these accidents.
Q: This implies that the conditions at work were safer in 1998-1999.
R: It notes that the real reason is the constant increase in the workload.
S: The number of accidents in 1998-1999 was 7,000 for the same number of workmen.
Which one of the following is the correct sequence?
(a) P Q S R (b) S R P Q
(c) P R S Q (d) S Q P R

FILL IN THE BLANKS

Directions (for the following 15 items) Each of the following **Fifteen** sentences has a blank space and four words are given after the sentence. Out of these four choices, select the word which you consider the most appropriate for the blank space and mark your choice on the Answer Sheet.

56. The officers threatened to take reprisals if the lives of their men were_____ by the conquered natives.
(a) irritated (b) destroyed
(c) endangered (d) enervated
57. Criticism that is made without suggesting areas of improvement is not _____and should be avoided if possible.
(a) constructive (b) mandatory
(c) sagacious (d) representative
58. Physicists dream of a unified theory of matter that could replace the current _____of mutually inconsistent theories that clutter the field.
(a) dearth (b) integration
(c) welter (d) bonanza
59. We must try to understand his momentary aberration for he has _____more strain and anxiety than any among us.
(a) understood (b) forgotten
(c) undergone (d) described
60. The guilt or innocence of the _____will be decided by the court of law.
(a) killer (b) criminal
(c) suspicious (d) accused
61. Rohit was about to move his bike into the compound of his apartment when a passer-by _____down the motorbike.
(a) turned (b) fell
(c) forced (d) knocked
62. The new industrial policy is a result of the confidence the government has in the ____ of the Indian industry.
(a) existence (b) maturity
(c) status (d) power
63. Although the economy suffers downturns, it has also strong _____and self-correcting tendencies.
(a) unstable (b) inauspicious
(c) perceived (d) recuperative
64. The affluent life-styles of contemporary politicians are in sharp contrast to the ways of living of the freedom fighters.
(a) niggardly (b) austere
(c) agnositc (d) economical
65. Of the several issue, that were discussed in the meeting, only a few were pertinent and most of them were _____
(a) contrasting (b) irrelevant
(c) reasonable (d) independent
66. The Minister felt that the recommendation made by the Committee _____was even though similar schemes had worked earlier.
(a) approved (b) infeasible
(c) pragmatic (d) profitable
67. The activities of the Association have deviated from the _____objectives set for it in the initial years.
(a) relevant (b) pristine
(c) original (d) total
68. Gaurav's behaviour is worthy of _____by all the youngsters.
(a) following (b) emulation
(c) exploration (d) trial
69. The priest addressed the_____ for more than an hour and was listened to with rapt attention.
(a) staff (b) complement
(c) congregation (d) crew
70. Many people take their spirituality very seriously and wonder about those who don't, worrying about them and _____ them to believe.
(a) venturing (b) enabling
(c) prodding (d) apprising

COMPREHENSION

Directions (For the following 25 items) In this Section you have **Five** short passages. After each passage you will find several questions based on the passage. First, read Passage-I, and answer the questions based on it. Then go on to the other passages. You are required to select your answers based on the contents of the passage and opinion of the author only.

Examples 'I' and 'J' are solved for you.

Passage

In approach to life, be it pragmatic or otherwise, a basic fact that confronts us squarely and unmistakably is the desire for peace,

security and happiness. Different forms of life at different levels of existence make up the teeming denizens of this earth of ours. And, no matter whether they belong to the higher groups such as human beings or to the lower groups such as animals, all beings primarily seek peace, comfort and security. Life is as dear to a mute creature as it is to a man. Even the lowliest insect strives for protection against dangers that threaten its life. Just as each one of us wants to live and not to' die, so do all other creatures.

I. The author's main point is that
   (a) different forms of life are found on earth
   (b) different levels of existence are possible in nature
   (e) peace any security and the chief goals of all living beings
   (d) even the weakest creature struggles to preserve its life.

J. Which one of the following assumptions or steps is essential in developing the author's position?
   (a) All forms of life have a single overriding goal
   (b) The will to survive of a creature is identified with a desire for peace
   (c) All beings are divided into higher and lower groups
   (d) A parallel is drawn between happiness and life, and pain and death

Explanation:

I. The idea which represents the author's main point is 'peace and security are the chief goals of all living beings,' which is response (c). So (c) is the correct answer,

J. The best assumption underlying the passage is 'The will to survive of a creature is identified with a desire for peace,' which is response (b). So (b) is the correct answer.

Passage I

Imagine your Information Technology business in a resort—like ambience. Your employees could have a holiday on every working day! Yes, God's own country is fast emerging as India's most happening Information Technology /Information Technology Enabled Services destination. The enviable tranquility, cleanliness, greenery and physical quality of life add to the aura. Consistently ranked as the No. 1 State in social achievements, Kerala is a dream destination for even the most discerning tourist. National Geographic Traveller has dubbed the State "One of the ten paradises of the world". Not for nothing. Its natural beauty, picturesque backwaters, enchanting beaches, authentic ayurvedic rejuvenation centres and rich cultural heritage continue to hold people from all over the world, spellbound. But of late, the State is turning out to be a one-stop address for every information technology need as well.

71. Which one of the following statements is correct?
   (a) Kerala is known for the maximum production of natural rubber.
   (b) There is lot of political awareness among people of Kerala.
   (c) Kerala has developed a strong infrastructure for Information Technology.
   (d) Kerala is a beautiful place along the Malabar Coast.

72. Which one of the following statements is correct?
   (a) Kerala is very well connected to rest of the country.
   (b) The above passage is a message for prospective entrepreneurs to invest in Kerala.
   (c) Kerala earns lot of foreign exchange because of its NRIs.
   (d) Employees in Kerala have a large number of holidays.

73. Which one of the following statements is correct?
   (a) Tourists to Kerala do not approve of the technology advances made in Kerala as it causes ecological imbalance.
   (b) Kerala impresses even the most demanding tourist.
   (c) The physical quality of life in Kerala has deteriorated because of industrialization.
   (d) Kerala has a large number of holiday resorts but it costs a lot to stay over there.

74. Which one of the following statements is correct?
   (a) Kerala is called as God's own country since its people are very religiously disposed.
   (b) Frequent political instability impacts the social development in Kerala.
   (c) Information Technology advances made in Kerala are nothing in comparison to its scenic beauty.
   (d) Tourists from all over the world flock to Kerala.

75. Which one of the following statements is not correct?
   (a) Kerala is credited with having made impressive social achievements.
   (b) All the needs pertaining to Information Technology can be met with in Kerala.
   (c) Ayurvedic rejuvenation centres and the picturesque surroundings are major attractions for the tourists.
   (d) Because of all-round greenery and humid climate in Kerala, the productivity of workers in Kerala is rather low.

Passage II

The Centre and the States must become partners in the planning process to determine national priorities together. The process of planning would undergo a change in view of the changes in domestic economic situation and momentous trends emerging in the world. The development of human resource and the building up of an institutional framework would have to receive priority attention. The role of the government would also have to be examined so as to fully involve the people in the process of nation-building. The main task would be to ensure that the real initiative is transferred to the people. The private sector which would register expansion hereafter should keep this objective firmly in view. The need for an effective population policy is an urgent necessity in the country's planning strategy. The family welfare programme should not be treated as the Centre's responsibility alone. The States should evolve a suitable mechanism for closer involvement of the Government agencies, Zilla Parishads and Panchayats for making the family welfare programme a success.

76. Which one of the following statements is correct?
   (a) Effective family welfare programme is Centre's responsibility alone.
   (b) Population policy and planning process are inter-linked.
   (c) Family welfare programme should be left to the State Governments alone.
   (d) The state Governments should use punitive measures to control population.

77. What should be given priority attention?
   (a) Role of the government
   (b) Decentralisation of power
   (c) Involvement of people in labour welfare
   (d) Human resource and institutional framework

78. Which one of the following statements is not correct?
(a) Role of the government in nation building should be examined.
(b) Real initiatives should be transferred to the people.
(c) There should be no role for the government as far planning is concerned.
(d) The Centre and the States must become equal partners in the planning process.
79. What would force the planning process to undergo a change ?
(a) Free-market forces
(b) Domestic economic situation and world trends
(c) Domestic compulsions
(d) International pressures
80. Which one of the following is implied by the expression 'momentous trends'?
(a) GDP growth of the country
(b) Memorable historical events
(c) Important changes in the international scene
(d) Improvement of Foreign Exchange reserves
81. Which one of the following agencies is not included in the expression 'closer involvement'?
(a) Planning Commission
(b) Government agencies
(c) Zilla Parishads
(d) Panchayats
82. Which one of the following is not stated in the passage?
(a) Nation-building (b) National priorities
(c) Private sector (d) Primary education

Passage III

"Lazybones"? There is not such thing. We may think that our bones are inert, dead, the body's structural steel. Actually, they are among the busiest living organs in the body. They are thriving manufacturing plants which make red and white blood cells 24 hours a day. Every minute about 180 million red cells die. Your bones must replace them with healthy young cells, or you face anemic death. It takes six to eight weeks for the marrow to restore the red blood cells after a pint of blood has been removed.

Bones have other responsibilities: they produce the white blood cells which fight off infection, and they act as one of the storehouses for reserve nourishment. In their marrow they husband fats and proteins for times of need. And they contain nearly all the body's vital calcium and phosphorus. Calcium is necessary for the clotting of blood, the beating of the heart, the contraction of muscles and the functioning of the nervous system. By an Intricate self regulating system, calcium from milk drunk today is deposited in the bones and calcium deposited last week is withdrawn.

83. Which one of the following statements is not correct?
(a) Bones are among the hyperactive organs ill the human body.
(b) Bones help purify the blood.
(c) Calcium helps in functioning of the nervous system.
(d) The marrow of the bones helps in restoration the red blood cells after even a minute quantity of blood has been removed.
84. Red cells are to anemic death as white blood cells are to
(a) nourishment (b) clotting of blood
(c) the beating of heart (d) infection
85. Which one of the following statements is not correct?
(a) Our bones ceaselessly manufacture red and white cells.
(b) Our bones take six to eight weeks to generate 180 x 24 x 60 million red cells.
(c) Bones store fats and proteins for future nourishment.
(d) Man cannot survive without calcium.
86. The marrow of the bones does not store which one of the following substances?
(a) Fats and proteins (b) White blood cells
(c) Calcium (d) Phosphorus

Passage IV

The practice of appointing educated persons to join under movement began more than a hundred and thirty years ago as a method of encouraging people to go in for the new system of education that had been established by colonial administration. It worked well till about 1921 because expansion of jobs under the government could still keep pace with the output of the educational system. But since then, the undesirable consequences of this approach have come to the fore. To begin with, it over-emphasizes the bread and butter objective of education and makes it a ladder which enables the ambitious to climb into privilege. even as it devalues the academic objective-the development of individuals dedicated to the pursuit of scholarship. Moreover, hunt for a place in the privileged sector or a well-paid and secure job in the organized sector creates immense pressure for the expansion of secondary and higher education because they grow man: in terms of the large numbers of aspirants for jobs rather than in relation to the small number of jobs available. This necessarily leads to an over-production of college graduates and to large-scale unemployment of the educated.

87. Which one of the following statements is correct?
Educated persons were given jobs under the government, more than a century ago, so that the young people
(a) did not remain unemployed.
(b) did not indulge in vandalism.
(c) went in for the new system of education.
(d) kept themselves busy.
88. Which one of the following statements is correct ?
The policies of the colonial administration were effective till about 1921 because
(a) they incorporated fair selection procedures.
(b) the number of jobs available could cope with the number of persons coming out of the education system.
(c) the quality of education was goad.
(d) vocational training facilities were easily available.
89. Which one of the following statements is correct ?
The system failed later on because
(a) the government did not take interest in providing the jobs.
(b) Indians did not prefer to join service under the government.
(c) the academic objective of the education system was abandoned.
(d) the government offered jobs only to the ambitious persons.
90. The expansion of secondary and higher education leads to which one of the following?
(a) Large number of job aspirants
(b) Creation of more jobs in tile unorganized sector
(c) Growth of Gross Domestic Product
(d) More jobs in the organized sector

Passage V

Once upon a time there lived a Giant in an ancient castle surrounded by a lovely garden. While the Giant was away, children returning from their school used to play in the garden every evening. There were flowers on the trees during the spring and fruits during the autumn. The children liked this garden very much. One day the Giant returned and drove the children away. He then built a huge wall around the garden. Days passed. Spring came and there were flowers smiling and birds singing everywhere outside the garden. But neither flowers nor birds emerged in the selfish Giant's garden. Snow and frost settled down permanently in the garden. One fine morning, the Giant noticed that the little children had stolen into the garden through a hole in the wall. They were sitting on the branches of the trees and every tree was in full bloom. Only in the farthest corner it was still winter and the tree was covered with snow. A little boy was crying bitterly under the tree because he was too small to climb it. The Giant stepped out into the garden. All the children ran away at the sight of him. The little boy did not see the Giant because his eyes were full of tears. The Giant walked up from behind the weeping child and lifted him to branch of the tree. At once the tree blossomed and the birds started singing. The Giant realized his mistake. He repented sincerely and pulled down the wall to let the children play freely in his garden.

91. Why did the little boy cry?
    (a) He wanted to enter the garden.
    (b) He fell down from a tree.
    (c) He could not climb this tree.
    (d) He was scolded by the Giant.
92. For how long did snow continue to cover the tree in one corner in the garden?
    (a) Till the Giant realized his mistake and repented.
    (b) Till the Giant stepped out into the garden.
    (c) Till the Giant placed the little boy on a branch on the tree.
    (d) Till the Giant destroyed the huge wall surrounding his garden.
93. Why didn't the little boy run away when the Giant entered the garden?
    (a) He was too small to run.
    (b) He could not see the Giant.
    (c) He wanted the Giant to help him climb the tree.
    (d) He did not want to level the garden.
94. Which one of the following statements is not correct in the context of the passage?
    (a) Winter settled in the garden in the absence of the children.
    (b) The little boy started crying when he saw the Giant.
    (c) The children ran away when they saw the Giant entering the garden on one fine morning.
    (d) The tree in the farthest corner blossomed when the little boy sat on one of its branches.
95. Why did the spring stay away from the Giant's garden?
    (a) Snow and frost had settled around the garden.
    (b) The Giant built a huge wall around the garden.
    (c) The Giant had driven away the children from the garden.
    (d) The children had destroyed all the plants while playing in the garden.

SPOTTING ERRORS

Directions (For the following 15 items) (i) In this Section a number of sentences are given. The sentences are underlined in three separate parts and each one is labelled (a), (b), (c). Read each sentence to find out. whether there is an error in any underlined part. No sentence has more than one error. When you find an error in anyone of the underlined parts (a), (b) or (c), indicate your response on the separate Answer Sheet at the appropriate space. You may feel that there is no error in a sentence. In than case letter (d) will signify a 'No error' response.

(ii) You are to indicate only one response for each item in your Answer Sheet. (If you indicate more that one response, your answer will be considered wrong.) Errors may be in grammar, word usage or idioms. There may be a word missing or there may be a word which should be removed.

(iii) You are not required to correct the error. Your are required only to indicate your response on the Answer Sheet.

Examples 'P' and 'Q' have been solved for you.

P. The young child (a) singed (b) a very sweet song. (c) No error. (d)

Q. We worked (a) very hard (b) throughout the season. (c) No error. (d)

Explanation

In item P, the word 'singed' is wrong. The letter under this part is (b); so (b) is the correct answer. Similarly, for item Q, (d) is the correct answer, as the sentence does not contain any error.

96. Despite of a good monsoon this year, (a) the production of foodgrains in the country (b) did not go up. (c) No error. (d)
97. The last of the Mughal emperors of India (a) was first imprisoned and (b) was later sent into exile by the British. (c) No error. (d)
98. Hardly as I stepped out of my house (a) when I saw some policemen (b) coming towards my house. (c) No error. (d)
99. Today, the cost of living (a) in such higher (b) that many people find it difficult to keep their hearth burning. (c) No error. (d)
100. Rina was trying for admission in the Engineering College (a) even though her parents (b) wanted her to take up medicine. (c) No error. (d)

101. Yavanika is one of the latest addition to good drama which
(a) (b)
appeared in recent times. No error.
(c) (d)

102. Children visiting the park are amused by the monkeys play
(a) (b)
in the cages. No error.
(c) (d)

103. I am better acquainted with the country than you. No error.
(a) (b) (c) (d)

104. Being occupied with important matters he had no
(a) (b)
leisure to see us. No error.
(c) (d)

105. He was not promoted to the rank of a Colonel till for few
(a) (b)
months of his resignation. No error.
(c) (d)

106. The man who is perpetually hesitating which of the two
(a) (b)
things he will do first, will ultimately do either. No error.
(c) (d)

107. No hill station is as beautiful as Darjeeling with its scenic
(a) (b) (c)
beauties. No error.
(d)

108. Being a well known Physicist, he was invited to deliver
(a) (b)
a lecture on laser technology. No error.
(c) (d)

109. The chief of idea of every common type of travelers is to
(a) (b)
see as any objects of interest as he possibly could. No error.
(c) (d)

110. He was hard down for money and was being harassed by his
(a) (b) (c)
creditor. No error.
(d)

SELECTING WORDS/PHRASES

Directions (For the following 10 items) In the following passage at certain points, you are given a choice of four words/phrases, underlined and marked (a), (b), (c) and (d). Choose the best word/phrase out of the four and indicate your choice in the relevant box of your Answer Sheet.

Examples 'K' and 'L' have been solved for you.

The river has been

K. (a) rising (b) raising
(c) arising (d) raised
all night. We built the raft

L. (a) too strong (b) very strong
(c) strong enough (d) durable
to hold us,

Explanation:

Out of the list given for item number K, only 'rising' is the correct choice. So (a) is the correct answer for the item K. For the item L, (c) is the correct answer.

The

111. (a) surfeit (b) allocation
(c) preponderance (d) misappropriation
of resources in India's health programme has never been, as far as can be

112. (a) thought, (b) utilized,
(c) restored, (d) ascertained,
a subject of published research of high quality and the unsatisfactory

113. (a) measure (b) nature
(c) evidence (d) type
of the foregoing account of the government sector. Nevertheless, India's health

114. (a) system (b) view
(c) development (d) method
shares several features of the

115. (a) fate (b) pattern
(c) differences (d) beauty
of health services in other developing countries whose professional medical structures and

116. (a) maturity (b) distribution
(c) length (d) range
of the health services are

117. (a) launched (b) inherited
(c) discovered (d) restrained
from a colonial past. These features include a

118. (a) complete (b) strong
(c) large (d) meagre
share of health budgets

119. (a) taken (b) allocated
(c) arranged (d) contributed
to major hospitals in urban centres and a consequent relative

120. (a) lapse (b) default
(c) strength (d) neglect
of the rural health infrastructure.

ANSWERS

1. (d)	2. (b)	3. (c)	4. (a)	5. (c)	6. (b)	7. (d)	8. (a)	9. (b)	10. (a)
11. (b)	12. (c)	13. (b)	14. (b)	15. (c)	16. (b)	17. (d)	18. (a)	19. (c)	20. (d)
21. (c)	22. (b)	23. (d)	24. (c)	25. (b)	26. (a)	27. (d)	28. (a)	29. (b)	30. (b)
31. (b)	32. (c)	33. (b)	34. (b)	35. (d)	36. (b)	37. (b)	38. (d)	39. (b)	40. (b)
41. (e)	42. (b)	43. (d)	44. (b)	45. (d)	46. (a)	47. (b)	48. (b)	49. (b)	50. (a)
51. (a)	52. (d)	53. (b)	54. (a)	55. (c)	56. (c)	57. (a)	58. (d)	59. (c)	60. (d)
61. (d)	62. (b)	63. (d)	64. (b)	65. (b)	66. (b)	67. (c)	68. (b)	69. (c)	70. (c)
71. (c)	72. (d)	73. (b)	74. (d)	75. (d)	76. (a)	77. (d)	78. (b)	79. (b)	80. (c)
81. (a)	82. (d)	83. (b)	84. (c)	85. (b)	86. (b)	87. (c)	88. (b)	89. (c)	90. (a)
91. (c)	92. (c)	93. (b)	94. (b)	95. (c)	96. (a)	97. (c)	98. (a)	99. (b)	100. (a)
101. (b)	102. (c)	103. (c)	104. (a)	105. (c)	106. (c)	107. (c)	108. (d)	109. (c)	110. (a)
111. (b)	112. (a)	113. (c)	114. (a)	115. (b)	116. (d)	117. (b)	118. (d)	119. (a)	120. (a)

Paper I
Part B — General Knowledge

Time Allowed: Two Hours **Maximum Marks: 100**

1. With whom of the following does the power to extend the jurisdiction of a High Court to, or exclude the jurisdiction of a High Court from any Union Territory rest?
   (a) President of India (b) Chief Justice of India
   (c) Law Commission (d) Parliament
2. Who appoints the Chief Justice of a High Court in India?
   (a) The Governor of the concerned State in consultation with the Chief Justice of India
   (b) The Chief Justice of India in consultation with the Governor of the concerned State
   (c) The Union Cabinet on the advice of the Governor of the concerned State
   (d) The President in consultation with the Chief Justice of India and the Governor of the concerned State
3. Which Article of the Constitution of India provides that "no person shall be deprived of his life or personal liberty except according to the procedure established by law"?
   (a) Article 18 (b) Article 19
   (c) Article 20 (d) Article 21
4. Consider the following statements :
   1. Under the Constitution of India adopted by the Constituent Assemble India was constituted into "Sovereign Socialist Secular Democratic Republic".
   2. In the Preamble of the Constitution of India, "Unity of the Nation" was substituted by "Unity and Integrity of the Nation" by the Constitution (Fortysecond Amendment) Act, 1976.

   Which of the statements given above is/are correct.
   (a) 1 only (b) 2 only
   (c) Both 1 and 2 (d) Neither 1 nor 2
5. Which one of the following statements is correct?
   (a) The President of India is not eligible for re-election.
   (b) When the President of India resigns from his office, he addresses his resignation letter to the Speaker of the Lok Sabha.
   (c) The Vice-President of India is elected by an electoral college consisting of the elected Members of both the Houses of Parliament.
   (d) When the Vice-President acts as the President of India, he ceases to perform the functions of the Chairman of the Rajya Sabha.
6. Who among the following authored the famous work 'A Contribution to the Critique of Political Economy'?
   (a) Adam Smith (b) John Locke
   (c) Karl Marx (d) Thomas Paine
7. Match List-I *(Schedule under the constitution of India)* with List-II *(Subject)* and select the correct answer using the codes given below the lists:

List I *(Schedule under the Constitution of India)*	List II *(Subject)*
A. Seventh Schedule	1. Languages
B. Eighth Schedule	2. Validation of certain Acts and Regulations
C. Ninth Schedule	3. Union, State and Concurrent Lists
D. Tenth Schedule	4. Provisions as to disqualification on ground of defection

Codes:

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

8. Consider the following statements:
   1. The Vice-President of India holds office for a period of six years from the date on which he enters upon his office.
   2. Under the Article 83 of the Constitution of India, as nearly as possible one-third of the Members of the Rajya Sabha retire on the expiration of every third year.

   Which of the statements given above is/are correct?
   (a) 1 only (b) 2 only
   (c) Both 1 and 2 (d) Neither 1 nor 2
9. Consider the following statements:
   1. The Attorney General of India holds office for a period of six years or till he completes 65 years of age, whichever is earlier.
   2. The Comptroller and Auditor General of India is not eligible for further office under the Union or a State Government after he ceases to hold his office.

   Which of the statements given above is/are correct?
   (a) 1 only (b) 2 only
   (c) Both 1 and 2 (d) Neither 1 nor 2
10. Consider the following statements:
    1. The only person to have been elected as the President of India without an election was Dr. N Sanjiva Reddy.
    2. The only person to have been elected as the President of India for two terms was Dr. S Radhakrishnan.

    Which of the statements given above is/are correct?
    (a) 1 only (b) 2 only
    (c) Both 1 and 2 (d) Neither 1 nor 2
11. Match List-I *(Part of the Constitution of India)* with List-II

(Subject Dealt With) and select the correct answer using the codes given below the lists:

List I *(Part of the Constitution)*	List II *(Subject Dealt With)*
A. Part IV	1. Fundamental Rights
B. Part IV A	2. Fundamental Duties
C. Part V	3. Directive Principles of State Policy
D. Part III	4. Union

Codes:

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

12. Who among the following former Prime Ministers of India have been the recipients of the Bharat Ratna Award?
    1. Jawaharlal Nehru 2. Lal Bahadur Shastri
    3. Indira Gandhi 4. Rajiv Gandhi

    Select the correct answer using the codes given below:
    (a) 1 and 3 (b) 2 and 4
    (c) 1, 2 and 3 (d) 1, 2, 3 and 4
13. Consider the following statements
    1. The first Electoral College for the Presidential election in India was constituted in 1951.
    2. So far 14 Presidential elections have been held in India.

    Which of the statements given above is/are correct?
    (a) 1 only (b) 2 only
    (c) Both 1 and 2 (d) Neither 1 nor 2
14. Consider the following statements:
    1. Leaders of opposition in the Rajya Sabha and the Lok Sahba are accorded statutory recognition.
    2. Consultative Committees of Members of Parliament attached to various Ministries are constituted by the Ministry of Home Affairs.

    Which of the statements given above is/are correct?
    (a) 1 only (b) 2 only
    (c) Both 1 and 2 (d) Neither 1 nor 2
15. Consider the following statements:
    1. In India, the Bill to change the territory of any State can be introduced in either House of Parliament only on the recommendation of the President.
    2. Sikkim was made a full-fledged State of the Indian Union by the Constitution (Thirty-sixth Amendment) Act, 1975.

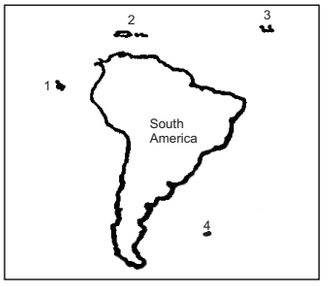
    Which of the statements given above is/are correct?
    (a) 1 only (b) 2 only
    (c) Both 1 and 2 (d) Neither 1 nor 2
16. Colonel rank of the Indian Army is equivalent to which one of the following ranks of the Indian Navy and the Indian Air Force?
    (a) Group Captain (Indian Air Force)
    (b) Wing Commander (Indian Air Force)
    (c) Commander (Indian Navy)
    (d) Commodore (Indian Navy)
17. Match List-I *(Defence Training Institute)* with List-II *(Location)* and select the correct answer using the codes given below the lists:

List I *(Defence Training Institute)*	List II *(Location)*
A. Army School of Physical Training	1. Ahmednagar
B. Rashtriya Indian Military College	2. Gopalpur-on-Sea
C. Air Defence Guided Missiles School	3. Pune
D. Armoured Corps Centre and School	4. Dehradun

Codes:

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

18. Consider the following statements:
    1. The Planning Commission of India is an independent Constitutional authority set up in pursuance of an Article of the Constitution of India.
    2. Chief Election Commissioner holds office during the pleasure of the President of India.

    Which of the statements given above is/are correct?
    (a) 1 only (b) 2 only
    (c) Both 1 and 2 (d) Neither 1 nor 2
19. In which Five Year Plan of India, was the State-wise breakup of the broad development targets, including targets for growth rates and social development set out for the first time in the country's planning?
    (a) Seventh Plan (b) Eighth Plan
    (c) Ninth Plan (d) Tenth Plan
20. Which Article of the Constitution of India enumerates Fundamental Duties for the citizens of India?
    (a) 39A (b) 42
    (c) 49 (d) 51A
21. Which one among the following States was created earliest?
    (a) Andhra Pradesh (b) Arunachal Pradesh
    (c) Haryana (d) Himachal Pradesh
22. Gulf of Bothania lies between which of the following countries?
    (a) Sweden and Finland
    (b) Italy and Greece
    (c) United Kingdom and France
    (d) United Kingdom and Ireland
23. 

In the map given above, four islands groups are marked as 1, 2, 3, and 4. Which of them are the Galapagos Islands made famous by Charles Darwin?
(a) 1 (b) 2
(c) 3 (d) 4

24. Consider the following :
1. Botanical Survey of India
2. Forest Survey of India
3. Zoological Survey of India
Which of the statements given above is/are correct?
(a) 1 only (b) 2 and 3
(c) 1 and3 (d) 1, 2 and 3

25. Which one of the following is the correct sequence of the given Union Territories in the decreasing order of their areas?
(a) Dadra and Nagar Haveli–Andaman and Nicobar Islands–Daman and Diu
(b) Andaman and Nicobar Islands–Dadra and Nagar Haveli–Daman and Diu
(c) Daman and Diu–Andaman and Nicobar Islands–Dadra and Nagar Haveli
(d) Dadra and Nagar Haveli–Daman and Diu-Andaman and Nicobar Islands

26. Match List-I *(Cities Connected)* with List-Il *(National Highway No.)* and select the correct answer using the codes given below the lists:

List I *(Cities Connected)*	List II *(National Highway No.)*
A. Delhi-Amritsar	1. NH 24
B. Delhi-Kolkata	2. NH 2
C. Delhi-Mumbai	3. NH 1
D. Delhi-Lucknow	4. NH 8

Codes:

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

27. Which of the following countries are members of the ASEAN?
1. Laos 2. Cambodia
3. Myanmar 4. Malaysia
Select the correct answer using the codes given below:
(a) 1 and 3 (b) 2 and 4
(c) 1, 3 and 4 (d) 1, 2, 3 and 4

28. Which is the only place in India where the Asiatic lions are found?
(a) Sariska National Park
(b) Sasan Gir National Park
(c) Nallamalai Hills of Andhra Pradesh
(d) Western Ghats of Malabar Coast

29. Which one of the following pairs is *not* correctly matched?

National Park		*State*
(a) Keibul Lamjao	:	Nagaland
(b) Namdapha	:	Assam
(c) Shivpuri	:	Madhya Pradesh
(d) Tadoba	:	Maharashtra

30. Which one of the following does not border Myanmar?
(a) Cambodia (b) Laos
(c) China (d) Thailand

31. Consider the following statements:
1. The North-East monsoon, commonly known as the winter monsoon blows from the sea to land.
2. The South-West monsoon, commonly known as the summer monsoon blows from land to the sea.
3. The South-West monsoon brings most of the rainfall during the year in the country.
Which of the statements given above is/are correct?
(a) 3 only (b) 1 and 2
(c) 2 and 3 (d) 1 and 3

32. Where was the first WTO Ministerial Conference held?
(a) Geneva (b) Rome
(c) Manila (d) Singapore

33. Match List-I *(Coal Fields)* with List-II *(States)* and select the correct answer using the codes given below the lists:

List I *(Coal Fields)*	List II *(States)*
A. Himgir	1. Chhatisgarh
B. Korba	2. Maharashtra
C. Kamptee	3. Andhra Pradesh
D. Singareni	4. Orissa

Codes:

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

34. Which one of the following countries is bordered by the Hudson Bay?
(a) Canada (b) U.S.A.
(c) Mexico (d) Costa Rica

35. Who among the following was awarded the Goldman Environmental Prizes 2004?
(a) Aruna Roy (b) Medha Patekar
(c) Rashida Bee (d) Rajender Singh

36. Consider the following statements :
1. Pine is a softwood tree.
2. Ebony is a hardwood tree.
3. Pine is a common tree in Mediterranean forests.
4. Ebony is a common tree of tropical evergreen forests.
Which of the statements given above is/are correct?
(a) 1 and 2 (b) 3 and 4
(c) 1, 2, 3 and 4 (d) 1, 2, 3 and 4

37. Consider the following organisations:
1. Physical Research Laboratory
2. Space Applications Centre
3. Vikram Sarabhai Space Centre
Which of the above is/are located at Ahemdabad?
(a) 1 only (b) 1 and 2
(c) 3 only (d) 2 and 3

38. Moving from the North towards the South, which one of the following is the correct sequence of the given towns of India?
    (a) Silvasa–Kolhapur–Pune–Ahmadnagar
    (b) Pune–Ahmadnagar–Silvasa–Kolhapur
    (c) Silvasa–Ahmadnagar–Pune–Kolhapur
    (d) Pune–Kolhapur–Silvasa–Ahmadnagar
39. Consider the following statements:
    1. South Africa is a major producer of gold.
    2. Cuba is a major producer of sugar.
    3. Democratic Republic of the Congo (Formerly Zaire) is a major producer of diamonds.
    Which of the statements given above is/are correct?
    (a) 2 only (b) 1 and 3
    (c) 1, 2 and 3 (d) 2 and 3
40. Consider the following statements:
    1. Area of Brazil is much larger than that of India.
    2. Lativia is situated in the north-eastern Europe.
    3. Croatia lies in the western part of Europe.
    Which of the statements given above is/are correct?
    (a) 1 only (b) 1 and 2
    (c) 2 and 3 (d) 1 and 3
41. Match List-I *(Beach)* with List-Il *(State)* and select the correct answer using the codes given below the lists:

List I *(Beach)*	List II *(State)*
A. Rishikonda Beach	1. Maharashtra
B. Elliot's Beach	2. Kerala
C. Cherai Beach	3. Tamil Nadu
D. Alibaug Beach	4. Andhra Pradesh

Codes:

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

42. Which one of the following is a rare species found in Gujarat's Rann of Kachchh?
    (a) Wild buffalo (b) Wild ass
    (c) Musk deer (d) Spotted deer
43. Which one of the following is the most suitable region for cultivation of cotton in India?
    (a) The Brahmputra Valley
    (b) The Indo-Gangetic Plain
    (c) The Deccan Plateau
    (d) The Coromandal Coast
44. Match List-I *(Port Towns)* with List-Il *(State)* and select the correct answer using the codes given below the lists:

List I *(Port Towns)*	List II (*State)*
A. Kakinada	I. Andhra Pradesh
B. Nagapattinam	2. Gujarat
C. Bhavnagar	3. Maharashtra
D. Redi	4. Tamil Nadu

Codes:

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

45. Consider the following statements:
    1. The Indo-Greek King Milinda became a Buddhist after his first debate with monk Nagasena.
    2. The language used for the commentaries of Buddha scriptures composed in the Budhist Council held by the Kushana King Kanishka was Sanskrit.
    Which of the statements given above is/are correct?
    (a) 1 only (b) 2 only
    (c) Both 1 and 2 (d) Neither 1 nor 2
46. The Indian King Amoghavarsha I, an author of repute belonged to which one of the following dynasties?
    (a) Chalukya (b) Pallava
    (c) Rashtrakuta (d) Satavahana
47. Which one of the following is the correct chronological order of the given Kings?
    (a) Chandragupta Vikramaditya–Samudragupta Kumargupta I–Skandagupta
    (b) Samudragupta–Chandragupta Vikramaditya–Kumargupta I–Skandagupta
    (c) Kumargupta I–Chandragupta Vikramditaya–Samudragupta–Skandagupta
    (d) Samudragupta–Skandagupta–Chandragupta Vikramaditya–Kumargupta I
48. Which one of the following events occurred first in the Indian History?
    (a) Accession of Harshvardhana
    (b) Invasion of Sind by Muhammad bin Kasim
    (c) Rise of the Eastern Chalukyas
    (d) Plunder of Somnath by Mahmud of Ghazni.
49. What was the general village assembly under the Cholas called?
    (a) Samiti (b) Mandalam
    (c) Taniyur (d) Ur
50. Hiuen Tsang travelled to India during the reign of which of the following rulers?
    (a) King Harshvardhana (b) Skandagupta
    (c) Kumargupta II (d) Rudradaman
51. During which period did Krishnadeva Raya, the best known ruler of Vijayanagar rule?
    (a) 14 century AD (b) 15 century AD
    (c) 16 century AD (d) 17 century AD
52. Who built the shore temple at Mahabalipuram?
    (a) Cholas (b) Pandyas
    (c) Chalukyas (d) Pallavas
53. Consider the following statements:
    1. Sadat Khan instigated Nadir Shah to attack Delhi.
    2. Sadat Khan's nephew Safdarjang succeeded him as the ruler of Awadh.
53. Safdarjang's son Shuja–ud Daula supported Ahamad Shah Abdali in the Third Battle of Panipat.
    Which of the statements given above is/are correct?
    (a) 1 and 2 (b) 2 only
    (c) 1 and 3 (d) 1, 2 and 3

54. Which one of the following statements is correct?
(a) The famous Sun Temple of Konarak was built by Narsimhadeva I
(b) Kashmir never became a part of the Mughal empire
(c) The Wodeyar dynasty in Karnataka region was overthrown by Tipu Sultan
(d) The Sena dynasty of Bengal ruled from their capital at Puruliya

55. Which one of the following pairs is not correctly matched?

Dynasty		*Founder*
(a) Slave	:	Qutbuddin Aibak
(b) Khalji	:	Jalaluddin Firuz Khalji
(c) Tughlaq	:	Muhammad-bin Tughlaq
(d) Lodi	:	Bahlol Lodi

56. Who among the following visited India first?
(a) Marco Polo (b) Nicolo Conti
(c) Ibn Batura (d) Vasco da Gama

57. Which one of the following pairs is not correctly matched?

(a) Akbar	:	Abul Pazl
(b) Jahangir	:	Abdul Qadir Badauni
(c) Shahjahan	:	Abdul Hamid Lahori
(d) Aurangzeb	:	Khafi Khan

58. Guru Arjan Dev died during the reign of which one of the following Mughal rulers?
(a) Akbar (b) Jahangir
(c) Shahjahan (d) Humayun

59. Consider the following statements:
As per the Government of Indian Act, 1935
1. The communal representation was abolished.
2. It was compulsory for the Governor's Provinces and the Princely States to accede to the proposed Federation of India.
3. A Federal Court was established.
Which of the statements given above is/are correct?
(a) 1, 2 and 3 (b) 1 and 2
(c) 3 only (d) 2 and 3

60. Who among the following set up a government in exile for India's independence in Kabul?
(a) Raja Mahendra Pratap
(b) Ras Bihari Bose
(c) Lala Lajpat Rai
(d) Vinayak Damodar Savakar

61. Consider the following statements:
1. Mahatma Gandhi's first Satyagraha in India was held at Kheda.
2. The Champaran Satyagraha came to an end due to arrest of Mahatma Gandhi.
3. In support of Ahmedadbad Mill workers' strike, Mahatma Gandhi undertook a fast unto death.
Which of the statements given above is/are correct?
(a) 1 and 2 (b) 3 only
(c) 1 only (d) 2 and 3

62. Who was the Governor General of India when a law to abolish the practice of Sati was enacted?
(a) Lord Amherst (b) Lord Bentinck
(c) Lord Hardinge (d) Lord Hastings

63. Which one of the following is the correct chronological order of the given rulers?
(a) Qutub-ud-din Aibak–Iltutmish–Razia Sultan–Ghiyasudin Balban
(b) Ghiyasudin Balban–Razia Sultan–Iltutmish–Qutub-ud-din Aibak
(c) Qutub-ud-din Aibak–Razia Sultan–lltutmish–Ghiyasudin Balban
(d) Ghiyasudin Baiban–lltutmish–Razia Sultan–Qutub-ud-din Aibak

64. Which one of the following is the correct chronological order?
(a) HunterCommission–SimonCommission–Minto-Morley Reforms
(b) Simon Commission–Minto-Morley Reforms–Hunter Commission
(c) Minto-Morley Reforms–Simon Commission–Hunter Commission
(d) Minto-Morley Reforms–Hunter Commission–Simon Commission

65. Consider the following statements:
1. Bankim Chandra Chattopadhyay worked as a Deputy Collector.
2. Ishwar Chandra Vidyasagar worked as a Principal of a Sanskrit College.
3. Raja Rammohan Roy worked as a Tax Collector.
Which of the statements given above is/are correct?
(a) 1 and 2 (b) 2 only
(c) 1 and 3 (d) 1, 2 and 3

66. Which one among the following was started first during Indian Freedom Struggle?
(a) Bengal British Indian Society
(b) British Indian Association
(c) Landholder's Society
(d) Madras Native Association

67. With reference to the Indian Freedom Struggle, consider the following statements:
1. TheNehruReportrecommendedlinguisticreorganization of the British Provinces.
2. The Nehru Report envisaged that the Governors of the Provinces were required to act on the advice of the Provincial Executive Council.
Which of the statements given above is/are correct?
(a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

68. Consider the following statements:
1. In Euro-2004 Football Championship, Greece defeated Denmark in the Semifinal.
2. In Euro-2004 Football Championship, Portugal defeated the Czech Republic in the Semifinal.
3. Croatia was one of the participating teams in the Euro-2004 Football Championship.
Which of the statements given above is/are correct?
(a) 3 only (b) 1 and 2
(c) 2 only (d) 1 and 3

69. Consider the following statements:
1. Coffee is a source of vitamin B_5
2. Pineapple is a source of vitamin C
3. Milk is a source of vitamin D
Which of the statements given above is/are correct?
(a) 1 and 2 (b) 2 and 3
(c) 1 and 3 (d) 1, 2 and 3

70. Which of the following produce the hormone testosterone in the human male reproductive system?
(a) Cowper's glands (b) Interstitial cells of Leydig
(c) Prostate gland (d) Seminal vesicles

71. From which one of the following plant parts is turmeric, a commonly used colourant and antiseptic obtained?
(a) Fruit (b) Leaf
(c) Root (d) Stem

72. Consider the following statements:
In human body,
1. there are five cervical vertebrae.
2. there are twelve pairs of ribs.
3. the cranium is the result of union of eight bones.
Which of the statements given above is/are correct?
(a) 1 and 2 (b) 2 only
(c) 2 and 3 (d) 3 only

73. Consider the following statements:
1. Scabies is caused by fungus.
2. Athelet's Foot is caused by mites. Which of the statements given above is/are correct?
(a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

74. Consider the following statements:
1. Generally buffalo's milk has more fat than cow's milk
2. A camel can gulp 50 liters of water at a time and store it in a specialized caecum in its abdomen.
Which of the statements given above is/are correct?
(a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

75. Match List-I *(Element)* with List-Il *(Function in Human Body)* and select the correct answer using the codes given below the lists:

List I *(Element)*	List II *(Function in Human Body)*
A. Iodine	1. Contraction of muscles
B. Iron	2. Formation of thyroxin
C. Calcium	3. Formation of haemoglobin of blood

Codes:

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

76. Which among the following are the symptoms of typhoid?
1. Headache and fever which rise to the maximum in the afternoon.
2. Increase of fever each day in the first week.
3. High fever in the second week.
4. Frequent loose motions and vomiting leading to dehydration.
Select the correct answer the using the codes given below :
(a) 1, 2 and 3 (b) 2, 3 and 4
(c) 1 and 4 (d) 1, 2, 3 and 4

77. Consider the following statements:
1. Sea horse is a bony fish.
2. Shark is a cartilaginous fish.
3. The skin of shark is not covered with scales.
Which of the statements given above is/ are correct?
(a) 1 only (b) 1 and 2
(c) 2 and 3 (d) 1, 2 and 3

78. Which one of the following pairs is not correctly matched?
(a) Kelucharan Mahapatra : Odissi dance
(b) Kailash Vajpeyi : Literature
(c) V. G. Siddhartha : Entrepreneur
(d) Ved Mehta : Golfer

79. Match List-I *(Artist)* with List-II *(Form of Dance)* and select the correct answer using the codes given below the lists:

List I *(Artist)*	List II *(Form of Dance)*
A. Birju Maharaj	1. Bharatnatyam
B. Mrinalini Sarabhai	2. Kathak
C. Raja Reddy	3. Kuchipudi
D. Savita Mehta	4. Manipuri

Codes:

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

80. Who among the following test cricketers had not been India's test wicket keeper?
(a) F. Engineer (b) Kiran More
(e) Brijesh Patel (d) Budhi Kunderan

81. Match List-I *(Author)* with List-II *(Book)* and select the correct answer using the codes given below the lists:

List I *(Author)*	List II *(Book)*
A. Sarojini Naidu	1. Glimpses of World History
B. Jawaharlal Nehru	2. Golden Threshold
C. S. Radhakrishnan	3. Conquest of Self
D. Mahatama Gandhi	4. An idealist view of life

Codes:

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

82. Consider the following statements :
1. Maria Sharapova defeated Jennifer Capriati in the Final to win Wimbledon-2004 Women's title.
2. Roger Federer defeated Andy Roddick in the Final to win Wimbledon-2004 Men's title.
Which of the statements given above is/are correct?
(a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

83. Match List-I *(Tourist Centres)* with List-II *(State)* and select the correct answer using the codes given below the lists:

List I *(Tourist Centres)*	List II *(State)*
A. Horsely Hills	1. Andhra Pradesh
B. Hampi	2. Gujarat
C. Khajiar	3. Karnataka
D. Palitana	4. Himachal Pradesh

Codes:

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

84. Which one of the following pairs is not correctly matched?
(a) Govinda Chandra Pandey : Saraswati Samman 2003
(b) Mallika Sarabhai : Sangeet Natak Akademi Award 2003
(c) N. R. Narayana Murthy : Ernst & Young's World Entrepreneur Award 2003
(d) J.M. Lyngdoh : Ramon Magsaysay Award 2003

85. Match List-I *(Famous Football Players)* with List-Il *(Country)* and select the correct answer using the codes given below the lists:

List I *(Famous Football Players)*	List II *(Country)*
A. W. Rooney	1. France
B. Thierry Henry	2. England
C. Milan Baros	3. Italy
D. Christian Vieri	4. Czech Republic

Codes:

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

86. Which one among the following was the major reason due to which Southern Philippines was in news in the recent past?
(a) Frequent earthquakes killing hundreds of people
(b) Insurgency and terrorist activity by local rebels
(c) Revival of volcanic eruptions after several centuries
(d) Severe economic crisis and civil strife due to crop failures

87. Consider the following statements:
1. Rock-cut Buddhist monasteries at Ajanta caves
2. Dilwara temple at Mount Abu
3. Hindu, Buddhist and the Jaina cave temples at Ellora
Which of tile above is/are
UNESCO World Heritage Site (s) ?
(a) 1 only (b) 1 and 2
(c) 1 and 3 (d) 2 and 3

88. Match List-I *(Person)* with List-Il *(Associated Company)* and select the correct answer using the codes given below the lists:

List I *(Person)*	List II *(Associated Company)*
A. N. Nilekani	1. TCS
B. Malvinder Mohan Singh	2. ITC
C. S. Ramadorai	3. Ranbaxy
D. Y.C. Deveshwar	4. Infosys

Codes:

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

89. Consider the following statements:
1. In India, the entire life insurance business was nationalized in 1956.
2. In India, medical insurance is offered only by the Life Insurance Corporation of India.
3. National Insurance Company is a subsidiary of the General Insurance Company.
Which of the statements given above is/are correct?
(a) 1 only (b) 1 and 2
(c) 1 and 3 (d) 2 and 3

90. The Silent Valley, Which was in the news recently, is a part of which one of the following?
(a) Mangrove forest
(b) Tropical deciduous forest
(c) Tropical evergreen forest
(d) Alpine forest

91. Consider the following statements :
1. India has made a deal with Russia for the acquisition of *'Admiral Gorshkov'*—an aircraft carrier which will become fully operational by the end of 2005.
2. The first of T-90S Main Battle Tank (MBT) named Bhishma is assembled in India from the Israel-made kits.
Which of the statements given above is/are correct?
(a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

92. Who among the following has been awarded the Dada Sahib Phalke Award 2003?
(a) Dev Anand (b) Dilip Kumar
(c) Hema Malini (d) Yash Johar

93. Which one among the following goods has been India's highest export item (in Rupees), in the recent years?
(a) Gems and Jewellery
(b) Textiles
(c) Chemicals and related products
(d) Engineering goods

94. Which one of the following is the correct chronological order of the entry of the Europeans in India as traders or colonizers?
(a) Portuguese–English–French
(b) Portuguese–French–English
(c) English–Portuguese–French
(d) English–French–Portuguese

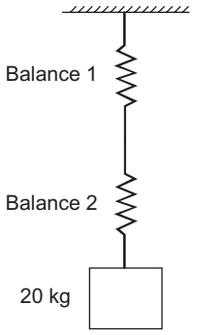
95. John Maxwell Coetzee who won the 2003 Nobel Prize for literature is from which one of the following countries?
(a) Finland (b) Nigeria
(c) Norway (d) South Africa

96. Which of the following pairs is not correctly matched

Person		*Organization*
(a) G. Madhavan Nair	:	ISRO
(b) R. A. Mashelkar	:	CSIR
(c) Tarlochan Singh	:	NTPC
(d) Uma.Shankar Mishra	:	CBI

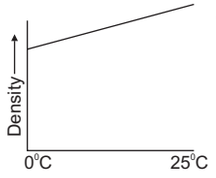
97. Consider the following statements :
1. Magalore Refinery and Petrochemicals Ltd. is a subsidiary of Reliance Industries Ltd.
2. At present; there is no ceiling on the Foreign Direct Investment in India on oil marketing.
Which of the statements given above is/are correct?
(a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

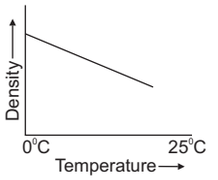
98.

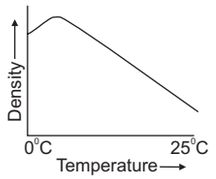


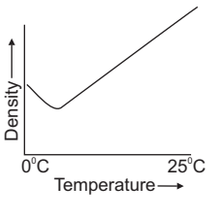
A block of mass 20 kg is suspended from two spring balances as shown in the figure given above.
Which one of the following is the correct statement?
(a) Both the balances read 20 kg each
(b) Both the balances read 10 kg each
(c) The upper balance reads 20 kg and the lower balance reads 0
(d) The upper balance reads 0 and the lower balance reads 20 kg

99. Which one of the graphs given below correctly represents the variation of density of water with temperature?

(a)


(b)


(c)


(d)


100. A barometer tube reads 76 cm. If the barometer tube is inclined making an angle 45° with the original position keeping the open end immersed in the mercury reservoir, what will be the reading of the barometer tube?
(a) 38 cm (b) 76 cm
(c) $76\sqrt{2}$ cm (d) Greater than 76 cm

101. A point object is placed midway between two concave mirrors (facing each other). Each of the mirrors has a focal length of 10 cm. What must be the distance between the mirrors for which only one image is seen?
(a) 10 cm (b) 20 cm
(c) 40 cm (d) 20 cm or 40 cm

102. A person having mass of x kg pushes another person having mass of $x/2$ kg with a force of x Newton. With what force does the person having mass of $x/2$ kg push back the heavier person?
(a) 0 (b) $x/2$ Newton
(c) x Newton (d) $3x/2$ Newton

103. A satellite is revolving around the earth in the direction of rotation of the earth. A point on the equator of the earth is viewed by an observer from the satellite after every 8 hours. How much time does the satellite take to complete one revolution around the earth?
(a) 24 hours (b) 16 hours
(c) 8 hours (d) 6 hours

104. Which one of the following compounds contains both ionic and covalent bonds?
(a) $CuS0_4$ (b) Al_2O_3
(c) NH_3 (d) H_2SO_4

105. Which one of the following elements is most stable? .
(a) $_7A^{14}$ (b) $_8B^{16}$
(c) $_9C^{18}$ (d) $_{10}D^{20}$

106. Particles of which of the following elements in air are extremely harmful for human beings?
(a) Lead and Arsenic (b) Lead and Mercury
(c) Mercury and Cadmium (d) Zinc and Iron

107. What does yellow colour of the flame in a lantern indicate?
1. Complete combustion of kerosene
2. Incomplete combustion of kerosene
3. Sufficient oxygen supply
4. Insufficient oxygen supply.
Select the correct answer using the codes given below:
(a) 1 and 3 (b) 1 and 4
(c) 2 and 3 (d) 2 and 4

108. Which one of the following pairs is not correctly matched?

Scientist		*Invention*
(a) B. Franklin	:	Galvanometer
(b) J. Gutenberg	:	Printing Press.
(c) T.A. Edison	:	Gramophone
(d) J.R. Openheimer	:	Atomic Bomb

109. Consider the following statements:
1. The audible frequency range of sound for human beings is 20 Hz to 20,000 Hz.
2. The ears of older people are generally more sensitive to higher frequencies.
3. Earthquakes produce sounds of frequency less than 20Hz.
Which of the statements given above is/are correct?
(a) 1 only (b) 2 and 3
(c) 3 only (d) 1 and 3

110. Which is the major constituent of natural gas obtained from oil wells?
(a) Methane (b) Ethane
(c) Butane (d) Pentane

111. Which one of the following is the correct sequence of the given elements in the ascending order of their atomic mass?
(a) Carbon–Nitrogen–Oxygen–Sodium
(b) Oxygen–Nitrogen–Sodium–Carbon
(c) Carbon–Oxygen–Sodium–Nitrogen
(d) Oxygen–Carbon–Nitrogen–Sodium

112. A homogeneous solid body floats in a liquid with 60 % of its portion immersed. What is the ratio of the density of the solid to that of the liquid?
(a) 3: 5 (b) 4: 5
(c) 5: 3 (d) 2 : 3

113. Using which mode of heat transfer, can heat travel through vacuum?
(a) Conduction (b) Radiation
(c) Convection (d) Both conduction and convection

114. Which one of the following phenomena occurs at absolute zero temperature?
(a) All gases become liquid
(b) Water freezes
(c) All substances become solids
(d) Molecular motion in a gas ceases

115. Consider the following statements:
Under India's National Highway Development Programme,
1. East-West Corridor extends between Silchar and Porbandar.
2. North-South Corridor extends between Amirstar and Kannyakumari.

Which of the statements given above is/are correct?
(a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

Directions The following 5 (five) items consist of two statements: one labelled as the 'Assertion (A)' and the other as 'Reason (R)'. You are to examine these two statements carefully and select the answer to these items using codes given below:

Codes:
(a) Both A and R are individually true and R is the correct explanation of A
(b) Both A and R are individually 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

116. **Assertion (A):** In 1776, Americans declared themselves to be no longer under the British Government.
Reason (R): Queen Elizabeth forced the american to pay the taxes.

117. **Assertion (A):** In the Periodic Table of chemical elements, ionisation energy decreases from top to bottom in group.
Reason (R): From top to bottom in a group, the distance of the outermost electrons from the nucleus increases.

118. **Assertion (A):** In India, the direction of North-East trade winds gets reversed to give rise to South-West monsoons.
Reason (R): In summer, the Indian seas get more heated than the land.

119. **Assertion (A):** Much of the stormy weather is associated with the region between 30° to 50° latitudes.
Reason (R): Most of the heat transfer from the surplus energy zones to the deficit energy zones takes place across the mid latitudes.

120. **Assertion (A):** AIDS can not spread through mosquitoes.
Reason (R): HIV kills the infected mosquitoes.

ANSWERS

1. (d)	2. (d)	3. (d)	4. (b)	5. (d)	6. (a)	7. (b)	8. (d)	9. (b)	10. (d)
11. (c)	12. (d)	13. (d)	14. (d)	15. (c)	16. (a)	17. (a)	18. (d)	19. (d)	20. (a)
21. (a)	22. (a)	23. (a)	24. (c)	25. (b)	26. (d)	27. (d)	28. (b)	29. (b)	30. (a)
31. (a)	32. (d)	33. (d)	34. (a)	35. (c)	36. (d)	37. (b)	38. (c)	39. (c)	40. (b)
41. (b)	42. (b)	43. (c)	44. (a)	45. (c)	46. (c)	47. (b)	48. (c)	49. (d)	50. (a)
51. (c)	52. (d)	53.(a)	54. (a)	55. (c)	56. (a)	57. (b)	58. (b)	59. (b)	60. (a)
61. (c)	62. (b)	63. (a)	64. (b)	65. (d)	66.(c)	67. (b)	68. (a)	69. (b)	70. (b)
71. (d)	72. (b)	73. (a)	74. (a)	75. (a)	76. (c)	77. (b)	78. (d)	79. (b)	80. (d)
81. (b)	82. (b)	83. (c)	84. (b)	85. (a)	86. (b)	87. (c)	88. (b)	89. (a)	90. (b)
91. (a)	92. (b)	93. (b)	94. (b)	95. (d)	96. (c)	97. (d)	98: (a)	99. (c)	100. (c)
101. (c)	102. (c)	103. (c)	104. (a)	105. (d)	106. (a)	107. (a)	108. (a)	109. (d)	110. (a)
111. (a)	112. (c)	113. (b)	114. (d)	115. (a)	116. (c)	117. (a)	118. (c)	119. (b)	120. (c)

PAPER II
ELEMENTARY MATHEMATICS

Time Allowed: Two Hours **Maximum Marks: 100**

1. The total surface area of a cylinder o base radius r and height l is k times the total surface area of a cone of base radius r and slant side l. Which one of the following is correct?
   (a) k is not an integer
   (b) k is equal to 3
   (c) k is equal to 2
   (d) k is approximately equal to 3.5
2. A sphere of copper is dropped into a cylinder of radius r and height h (>4r) which is half filled with water. If the diameter of the sphere is $\frac{r}{2}$, the water will rise through which one of the following?
   (a) $\frac{4r}{3}$ (b) $\frac{r}{48}$
   (c) $\frac{r}{4}$ (d) $\frac{r}{6}$
3. What is the minimum radius (>1) of a circle whose circumference is an integer?
   (a) 2 (b) $\frac{4}{\pi}$
   (c) $\frac{6}{\pi}$ (d) $\frac{3}{\pi}$
4. The distance between the parallel sides of a trapezium = The distance between the mid-point of the slant sides = 4 cm. What is the area of the trapezium ?
   (a) 4 cm^2 (b) 8 cm^2
   (c) 16 cm^2 (d) 29 cm^2
5. A circular wire of radius 20 cm is cut to spread over the circumference of another circular wire of diameter 2 m. What is the angle subtended by the wire at the centre ?
   (a) $\frac{\pi}{4}$ radian (b) $\frac{2\pi}{5}$ radian
   (c) $\frac{\pi}{3}$ radian (d) $\frac{\pi}{5}$ radian
6. The length of an arc AB of a circle is 22 m, and the tangent to the circle at the points A and B are inclined to each other at an angle of 120°. What is the value of the radius of the circle?
   (a) 21 m
   (b) 4.2 m
   (c) Either 21 m or 4.2 m
   (d) Cannot be determined with the given data.
7. The mean of n observations is m. If $m^2 - m + 1$ is added to each observation, what shall be the value of the new mean?
   (a) $m^2 + 1$ (b) $m^2 - m + 1$
   (c) $1 - m$ (d) 0
8. If for a frequency distribution with unequal class intervals, the frequency of a class is proportional to the area of the corresponding rectangle of the chosen graph, what is this graph termed as ?
   (a) Frequency polygon (b) Frequency curve
   (c) Bar diagram (d) Histogram
9. The medium of 15 observations is 61.5. If 10 is added to the observation with minimum value and 10 is subtracted from that with the maximum value, what shall be the value of the new median?
   (a) 61.5 (b) 71.5
   (c) 51.5 (d) Nothing definite can be said
10. Match List-I (*Statistical Term*) with List-II (*Characteristic*) and select the correct answer using the codes given below the Lists:

List-I (*Statistical Term*)	**List-II** (*Characteristic*)
A. Arithmetic Mean	1. Divides the measurements into four equal parts when the measurements are in natural order
B. Median	
C. Mode	2. Most frequent value
D. Quartile	3. Divides the measurements into two equal parts when the measurements are in natural order
	4. Sum of the deviations from this measure is zero

Codes:

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

Directions The following five (5) items consists of two statements, one labelled as the 'Assertion (A)' and the other as 'Reason (R)'. You are to examine these two statements carefully and select the answers to these items using the codes given below:
(a) Both A and R are individually true and R is the correct explanation of A
(b) Both A and R are individually 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

11. **Assertion (A):** A bar chart is a two dimensional figure.
    Reason (R): In a bar chart, the height of each bar is of significance and not its width.
12. **Assertion (A):** Mode is not a good measure of central tendency.
    Reason (R): Mode lays too much emphasis on the modal group and does not consider other variates at all.
13. **Assertion (A):** If p is a prime number and it divides ab, where a, b are positive integers, then p must divide either a or b.
    Reason (R): This is true if p is any positive integer.

14. **Assertion (A):** The sum of $\frac{1}{\sqrt{5}+\sqrt{6}}$ and $\frac{1}{\sqrt{6}+\sqrt{7}}$ is irrational.
Reason (R): The sum of two irrational numbers is always irrational.
15. **Assertion (A):** If O is the orthocenter of the triangle ABC, then $\angle BOC$ and $\angle BAC$ are supplementary.
Reason (R): Both the triangles BOC and BAC have a common base.
16. Let $p(x)$ and $q(x)$ be two unequal polynomials, and $h(x)$ and $l(x)$ be their HCF and LCM respectively, $p(x)$ divides $q(x)$.
Consider the following
1. $l(x)\,p(x) = h(x)\,q(x)$
2. $p(x)\,q(x) = l(x)\,h(x)$
3. $p(x) + q(x) = l(x) + h(x)$
Which of the above is/are correct?
(a) 2 only (b) 1 and 3
(c) 2 and 3 (d) 1, 2 and 3
17. p and q are two expressions whose LCM and HCF are P and Q respectively. If $p + q = P + Q$, then which one of the following is correct?
(a) $p + 2q = P + 2\,Q$ (b) $p - q = P - Q$
(c) $p^2 - q^2 = P^2 + Q^2$ (d) $p^2 + q^2 = P^2 + Q^2$
18. When expression $x^3 + 3x^2 - kx + 4$ is divided by $x - 2$, it leaves a remainder k. What is the value of k?
(a) 4 (b) 8
(c) 12 (d) 16
19. For what value of k, the equations $x + y = 2$, $3x + 4y = 7$ and $x - y = k$ have no common solution?
(a) k is any real number
(b) $k = 0$
(c) k is any real number other than 0
(d) k is an integer
20. The average scores of boys and girls in an examination of a school are 71 and 73 respectively. The average score of the school in that examination is 71.8. What is the ratio of the number of boys to the number of girls who appeared in the examination?
(a) $\frac{5}{2}$ (b) $\frac{1}{4}$
(c) $\frac{3}{2}$ (d) $\frac{2}{3}$
21. A takes 2 hours more than B to walk d km, but if A doubles his speed he can make it in 1 hour less than B. How much time does B require for walking d km?
(a) $\frac{d}{2}$ (b) 3 hours
(c) 4 hours (d) $\frac{2d}{3}$ hours
22. Both A and B have some money. If A gives Rs. 30 to B, then B will have twice the money left with A. But if B gives Rs. 10 to A, then A will have thrice the money as much as is left with B. What is the amount of money with A?
(a) Rs. 44 (b) Rs. 62
(c) Rs. 72 (d) Rs. 34
23. $(x + 1)$ is the HCF of $ax^2 + bx + c$ and $bx^2 + ax + c$. What is the value of c?
(a) -1 (b) 1
(c) 0 (d) The value of c cannot be determined
24. x and y denote the digits of a number at the ten's place and unit's place respectively. The sum of the two digits of the number is 13. If the digits are interchanged, the new number thus formed is smaller than the original number by 7. Which one of the following pairs of linear equations on being solved will give the values of x and y?
(a) $10x + y = 13$, $9(x - y) = 7$
(b) $x + y = 13$, $9(y - x) = 7$
(c) $x + y = 13$, $9(x - y) = 7$
(d) $10x + y = 13$, $19(y - x) = 7$
25. Two polynomials
$P(x) = (x^2 + 3x + 2)(x^2 - 4x + a)$ and
$Q(x) = (x^2 - 6x + 9)(x^2 + 4x + b)$
Have their HCF as $(x + 2)(x - 3)$. What are the values of a and b respectively?
(a) 3 and 4 (b) 4 and 5
(c) 4 and 6 (d) 3 and 5
26. Let $p \in R$. Under which one of the following conditions is the equation $\sin x = p^2 - 4p + 5$ valid?
(a) $p < 2$ (b) $p > 2$
(c) $p = 0$ (d) $p = 2$
27. If $\operatorname{cosec}\theta = \sqrt{3\sqrt{3\sqrt{3\sqrt{.....}}}}$ infinitely, what is the value of $\sin\theta$?
(a) $\frac{1}{3}$ (b) $\frac{1}{\sqrt{3}}$
(c) $\frac{1}{9}$ (d) 1
28. Consider the following inequalities
1. $\sin 1^\circ < \sin 1^c$
2. $\cos 1^\circ < \cos 1^c$
3. $\tan 1^\circ < \tan 1^c$
Which of the inequalities given above are correct?
(a) 1 and 2 (b) 2 and 3
(c) 2 and 3 (d) 1, 2 and 3
29. What is the value of
$\cos^2 0^\circ + \cos^2 3^\circ + \cos^2 6^\circ + \ldots \cos^2 90^\circ$?
(a) 15 (b) 15.5
(c) 16 (d) 16.5
30. If $\sec x + \cos x = 2$, what is the value of $\sec^{10} x + \cos^{10} x$?
(a) 1 (b) 2
(c) 2^5 (d) 2^{10}
31. A person drives his car at an average speed of 40 km/hour on a straight road which runs 60° North of East. How far East of his starting point is he after 2 hours of driving?
(a) 20 km (b) 40 km
(c) $40\sqrt{3}$ km (d) $20\sqrt{3}$ km
32. If $\cos(A - B) = \frac{1}{2}$ and $\sin(A + B) = \frac{1}{2}$, what is the smallest positive value of A?
(a) 135° (b) 60°
(c) 30° (d) 105°
33. Consider the following statements:
1. $\sin\theta$ and $\operatorname{cosec}\theta$ are both positive in the 1st and 2nd quadrants.
2. $\cos\theta$ and $\sec\theta$ are both positive in the 1st and 3rd quadrants.

3. tan θ and cot θ are both positive in the 1st and 3rd quadrants.

Which of the statements, given above are correct?

(a) 1, 2 and 3 (b) 1 and 2
(c) 2 and 3 (d) 1 and 3

34. If $ax^6 - c$ and $bx^6 - d$ leave no remainders when divided by $mx + n$ and $nx + m$, respectively; then which one of the following is correct?

(a) $ab = cd$ (b) $ac = bd$
(c) $ad = bc$ (d) $ac^6 = db^6$

35. A grocer buys two kinds of rice X and Y; one (X) at the rate of Rs. A per kg, and the other (Y) at the rate of Rs. B per kg. He mixes them and obtains a mixture of Rs. C per kg. What is the ratio of the variety X to that of the variety Y in the mixture?

(a) $a : b$ (b) $(a + c) : (b + c)$
(c) $(c - a) : (b - c)$ (d) $(b - c) : (c - a)$

36. If $(x + y)^2 - z^2 = 4$, $(x + z)^2 - x^2 = 9$, $(z + x)^2 - y^2 = 36$; what is/are the value(s) of $x + y + z$?

(a) ± 1 (b) 0
(c) ± 3 (d) ± 7

37. $\frac{a}{b+c} = \frac{b}{c+a} = \frac{c}{a+b} = k$

Consider the following:

1. $k = \frac{1}{2}$, if $a + b + c \neq 0$
2. $k = -1$, if $a + b + c = 0$
3. $k = 1$, if $a + b + c = 0$

Which of the above is/are correct?

(a) 1 only (b) 2 only
(c) 1 and 2 (d) 1 and 3

38. What is the value of HCF of $a^2 - b^2 - c^2 - 2bc$, $b^2 - c^2 - a^2 - 2ca$ and $c^2 - a^2 - b^2 - 2ab$?

(a) $a + b + c$ (b) $a + b - c$
(c) $a - b + c$ (d) 1

39. If $x = 2 + 2^{2/3} + 2^{1/3}$. What is the value of the expression $x^3 - 6x^2 + 6x$?

(a) -1 (b) 0
(c) 1 (d) 2

40. Let $X_k = (p_1 p_2 \ldots p_k) + 1$ where $p_1 p_2 \ldots p_k$ are the first k primes.

Consider the following:

1. Xk is a prime number
2. Xk is a composite number
3. Xk + 1 is always an even number

Which of the above is/are correct?

(a) 1 only (b) 2 only
(c) 3 only (d) 1 and 3

41. For integers x, y and z consider the following:

1. HCF $(x, y) = 1$, HCF $(y, z) = 1 \Rightarrow$ HCF $(x, z) = 1$
2. LCM $(x, y) = xy$, LCM $(y, z) = yz \Rightarrow$ LCM $(x, z) = xz$

Which of the above is/are correct?

(a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

42. In limestone, 40% is calcium and the rest is carbon and oxygen. If in 20 kg of limestone, there is 9.4 kg of oxygen, what is the percentage of carbon in it?

(a) 12% (b) 13%
(c) 14% (d) 15%

43. Consider the following statements:

1. If x and y are composite numbers, then $x + y$ is always composite.
2. There does not exist a natural number which is neither prime nor composite.

Which of the above statements is/are correct?

(a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

44. How many digits are there in the expansion of 3^{17}? ($\log_{10} 3 = 0.4771$)

(a) 7 (b) 8
(c) 9 (d) 10

45. If $x^3 + \left(\frac{1}{x^3}\right) = p$, what is the value of

$$\left(\frac{x^2+1}{x}\right)\left[\left(\frac{x^2+1}{x}\right)^2 - 3\right] ?$$

(a) $\frac{p}{2}$ (b) p
(c) $3p$ (d) $p - 3$

46. If $ab + bc + ca = 0$, then what is the value of $\left(\frac{1}{a^2-bc} + \frac{1}{b^2-ca} + \frac{1}{c^2-ab}\right)$?

(a) 0 (b) 1
(c) 3 (d) $a + b + c$

47. If the polynomial $x^5 + px^4 + 7x^3 + x^2 + 5x + 7$ is divisible by $x^3 + 1$, then what is the value of p?

(a) 0 (b) 5
(c) -5 (d) -1

48. $(x - \alpha + 1)$ is one of the two factors of $x^2 - x(\alpha + \beta) + (\alpha - 1)(\beta + 1)$. What is the other factor?

(a) $x - \beta$ (b) $x - a - \beta$
(c) $x - \beta + 1$ (d) $x - \beta - 1$

49. $9x^4 - 12x^3 + 10x^2 + px + 1$ is a perfect square. What is the value of p?

(a) -2 (b) 2
(c) 4 (d) -4

50. The compound interest on a sum of money for 2 years at the rate of 5% per annum is Rs. 328. What is the simple interest for twice the principal for the same period of 2 years and at the same rate of interest?

(a) Rs. 656 (b) 640
(c) Rs. 664 (d) Rs. 650

51. In how many ways can Rs. 10 be paid in 50 paise coins or 25 paise coins of both?

(a) 19 (b) 20
(c) 21 (d) 22

52. Match List-I (*Figure*) with List-II (*Number of Lines of Symmetry*) and select the correct answer using the codes given below the Lists:

List-I (*Figure*)	**List-II** (*Number of Lines of Symmetry*)
A. Square	1. Zero
B. Rhombus	2. One

C. Trapezium	3. Two
D. Isosceles triangle	4. Three
	5. Four

Codes:

(a)	A	B	C	D
	2	3	1	5
(b)	A	B	C	D
	5	1	4	2
(c)	A	B	C	D
	2	1	4	5
(d)	A	B	C	D
	5	3	1	2

53. How many equilateral triangles can be formed by joining the mid-points of faces of a cube?
(a) 4 (b) 8
(c) 16 (d) Nil

54. If the area of a triangle formed by joining the mid-points of three adjacent faces of a cube is $\sqrt{3}$ square units, what is the total surface area of the cube?
(a) $6\sqrt{3}$ sq. units (b) $12\sqrt{3}$ sq. units
(c) 24 sq. units (d) 48 sq. units

55. Then length of a diagonal of a cuboid is 28 cm and the sum of the lengths of its three edges is 44 cm. What is the total surface area of the cuboid?
(a) 576 cm^2 (b) 1152 cm^2
(c) 1728 cm^2 (d) 2304 cm^2

56. What is the semi-vertical angle of a cone whose lateral surface area is double the base area?
(a) 30° (b) 45°
(c) 60° (d) 15°

57. What is area of an equilateral triangle inscribed in a circle of unit radius?
(a) $3\sqrt{3}$ sq. units (b) $\frac{3\sqrt{3}}{2}$ sq. units
(c) $\frac{3\sqrt{3}}{4}$ sq. units (d) $\frac{3\sqrt{3}}{16}$ sq. units

58. The length of diagonal of a rectangle is $4\sqrt{3}$ can which makes an angle of 30° with one of its sides. What is the area of the largest circle that can be inscribed in the rectangle?
(a) 3π cm^2 (b) 9π cm^2
(c) 12π cm^2 (d) 36π cm^2

59. L_1 and L_2 are two intersecting straight lines. How many circles can be drawn touching both the lines?
(a) 1 (b) 2
(c) 5 (d) Infinite

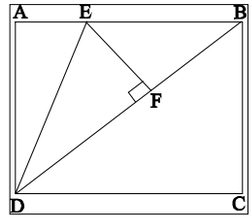
60. What is the locus of the centres of all the circles which touch a given straight line L at a given point P on it?
(a) A circle
(b) A straight line through P perpendicular to L
(c) A straight line through P making an angle 30° with L
(d) A straight line through P making an angle 45° with L

61. A triangle has sides of length 3 cm, 4 cm and 5 cm. What is the area of the circle inscribed in the triangle?
(a) π cm^2 (b) $\frac{\pi}{2}$ cm^2
(c) $\frac{\pi}{4}$ cm^4 (d) 2π cm^2

62. OD is perpendicular to the chord AB of a circle whose centre is O. If BC is the diameter of the circle, then AC is equal to which one of the following?
(a) OD (b) $\left(\frac{3}{2}\right)$ OD
(c) 2 OD (d) 3 OD

63. Two concentric circles with centre O have radii 4 cm and 6 cm. OP and OPR are the common lined radii of the circles. If the tangent at P is drawn to meet bigger circle at point Q, what the length of QR?
(a) $2\sqrt{6}$ cm (b) $3\sqrt{3}$
(c) $4\sqrt{3}$ (d) $4\sqrt{6}$ cm

64. The area of the four walls of a room is 99 m^2. The sum of length and breadth of the room is 11 m. What is the height of the room?
(a) 4.1 m (b) 4.3 m
(c) 4.5 m (d) 4.7 m

65. 

In the above figure ABCD is a rectangle with AD = 4 units and AE = EB, EF is perpendicular to DB and is half of DF. If the area of the triangle DEF is 5 sq. units what is the area of ABCD?
(a) 20 sq. units (b) 28 sq. units
(c) $18\sqrt{3}$ sq. units (d) 24 sq. units

66. A cuboid has edges of x cm, 1 cm and 2 cm. The total surface area of the cuboid has a numerical value which is some integral multiple of the numerical value of its volume. What is the value of x for minimum positive possible integral multiple?
(a) 5 cm (b) 2 cm
(c) 3 cm (d) 4 cm

67. A square hole of cross-sectional area 4 cm^2 is drilled across a cube with its length parallel to a side of the cube. If an edge of the cube measures 5 cm, what is the total surface area of the body so formed?
(a) 140 cm^2 (b) 142 cm^2
(c) 162 cm^2 (d) 182 cm^2

68. A is the lateral surface area of right circular cone with x as the radius of the base and height y. B is the lateral surface area of a right circular cone with y as the radius of the base and height x. If A > B, which one of the following is correct?
(a) $x = y$ (b) $x < y$
(c) $x > y$ (d) $(x + y)$ < slant height of each cone

69. The base radius of a cone doubled. To maintain its volume at the same value, the height of the cone must be reduced by which one of the following factors?
(a) $\frac{1}{2}$ (b) $\frac{1}{3}$
(c) $\frac{1}{4}$ (d) $\frac{1}{6}$

70. The angles of depression of two posts at a distance of 2 units on the same side of a road from a balloon vertically over the

road, are observed to be 45° and 60°. What is the height of the balloon?

(a) $3-\sqrt{3}$ (b) $\sqrt{3}-1$

(c) $3+\sqrt{3}$ (d) $\sqrt{3}+1$

71. If A, B, C are three angles of a triangle, then which one of the following relations is not correct?

(a) sin A = sin (B + C) (b) tan (A – B – C) = tan 2A

(c) $\cos\left(\frac{B+C}{2}\right)=\sin\left(\frac{A}{2}\right)$ (d) cos (B + C) = cos A

72. Which one of following is a tigonometrical identity?

(a) $\frac{\tan A-\tan B}{\sin A+\cos B}=\frac{\sin A-\cos B}{\tan A+\tan B}$

(b) $\frac{\tan A-\tan B}{\sec A+\sec B}=\frac{\sec A+\sec B}{\tan A+\tan B}$

(c) $\frac{\tan A-\tan B}{\tan A+\tan B}=\frac{\sec A-\sec B}{\sec A+\sec B}$

(d) $\frac{\tan A-\tan B}{\tan A+\tan B}=\frac{\sin A-\cos B}{\sin A+\cos B}$

73. If $0<\theta<\frac{\pi}{2}$ and tan θ + sec θ = 2, what is the value of sin θ?

(a) $\frac{3}{5}$ (b) $\frac{4}{5}$

(c) $\frac{3}{4}$ (d) –1

74. If $a\cos\theta + b\sin\theta = c$, what is the value of $(a\sin\theta - b\cos\theta)^2$?

(a) $a^2+b^2+c^2$ (b) $a^2+b^2-c^2$

(c) $a^2-b^2+c^2$ (d) $a^2-b^2-c^2$

75. If $\tan\theta + \cot\theta = 2$, what is the value of $\tan^4\theta + \cot^4\theta$?

(a) 2 (b) 16

(c) 0 (d) 4

76. Let tan A – tan B = x and cot B – cot A = y.

What is the value of $\frac{\cot A\cot B+1}{\cot B-\cot A}$?

(a) $x+y$ (b) $x-y$

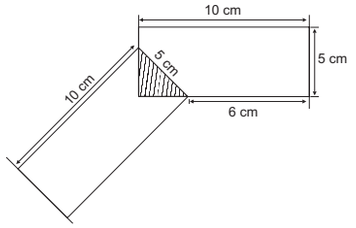
(c) $\left(\frac{1}{x}\right)-\left(\frac{1}{y}\right)$ (d) $\left(\frac{1}{x}\right)+\left(\frac{1}{y}\right)$

77. If A, B, C and D are angles of a cyclic quadrilateral other than a rectangle or a square, what is the value of (cos A + cos B + cos C + cos D)?

(a) 4 (b) 1

(c) 1 (d) 0

78.

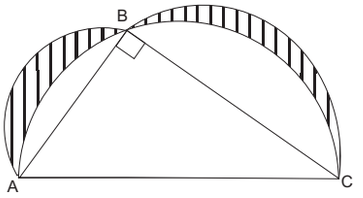


What is the area of the unshaded portion given in the above diagram in which two equal rectangles overlap?

(a) 94 cm^2 (b) 88 cm^2

(c) 75 cm^2 (d) Cannot be determined as the data is insufficient

79.

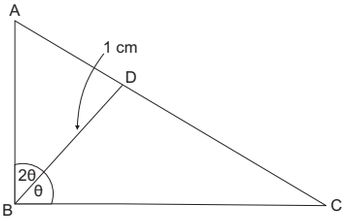


In the above figure, ABC is a right-angled triangle with B as the right angle. Three semicircles are drawn with AB, BC and AC as the diameters. What is the area of the shaded portion if the area of triangle ABC is 12 square units?

(a) 6 square units (b) 12 square units

(c) 24 square units (d) Cannot be determined as the data is insufficient

80.



One of the medians of a right-angled triangle ABC is of length l cm and it divides the right angle in the ratio 1 : 2. What is the area of the triangle?

(a) $\frac{l^2}{2}$ cm^2 (b) $\frac{l^2\sqrt{3}}{2}$ cm^2

(c) l^2 cm^2 (d) $l^2\sqrt{3}$ cm^2

81. What is the number of double cones of semi-vertex angle α and having r as the radius of the mid-section which can be moulded out of a cylinder of base radius r and height $2r\cot\alpha$?

(a) 1 (b) 2

(c) 3 (d) 6

82. The minute had of a clock is 1.5 cm long. What is the distance traveled by its tip during an interval of 40 minutes? (*Take* π = 3.14)

(a) 3.14 (b) 4.71

(c) 6.28 (d) 9.42

83. If a is 60% of b. What per cent of $4a$ is $5b$?

(a) $\frac{25}{12}\%$ (b) $\frac{625}{3}\%$

(c) 148% (d) 240%

84. A school has to buy at least 15 chairs within a budgetary ceiling of Rs. 2000. A chair with arms costs Rs. 160 and one without arms costs Rs. 100. What is the maximum number of chairs with arms that the school can buy?

(a) 7 (b) 8

(c) 9 (d) 12

85. What is the least natural number which leaves no remainder when divided by all the digits from 1 to 9?

(a) 1800 (b) 5040

(c) 1920 (d) 2520

86. Match List I (*Time*) with List II (*Angle Between Hour Hand and Minute Hand of a Clock*) and select the correct answer using the codes given below the lists:

List I (*Time*)	List II (*Angle Between Hour Hand and Minute Hand of a Clock*)
A. 1.10 p.m.	1. 20°
B. 2.15 p.m.	2. $22\frac{1}{2}°$
C. 8.40 p.m.	3. 24°
	4. 25°
	5. 30°

Codes:

	A	B	C		A	B	C
(a)	5	3	2	(b)	5	2	1
(c)	4	3	2	(d)	4	2	1

87. What is the remainder obtained with 2^{31} is 5?
(a) 1 (b) 2
(c) 3 (d) 4

88. What is the number of quadratic factors of $x^4 + x^2 + 1$?
(a) zero (b) 1
(c) 2 (d) 4

89. For $x^2 + 2x + 5$ to be a factor of $x^4 + px^2 + q$ what must be the values of p and q respectively?
(a) 5, 25 (b) 10, 20
(c) 6, 25 (d) 14, 25

90. m men working m hours per day can do m units of work in m days. How many units of this work would be completed by n men working n hours per day for n days?
(a) $\frac{m^4}{n^3}$ (b) n
(c) $\frac{n^2}{m^3}$ (d) $\frac{n^3}{m^2}$

91. What is the speed of a train if it overtakes two persons who are walking in the same direction at the rate of a m/s, $(a + 1)$ m/s, and pass them completely in b seconds and $(b + 1)$ second respectively?
(a) $(2a + 1)$ m/s (b) $\frac{(2a+1)}{2}$ m/s
(c) $(a + b)$ m/s (d) $(a + b + 1)$ m/s

92. Match List I and List II and select the correct answer using the codes given below the Lists:

List I	List II
A. (X – Y)	1. X ∪ Y'
B. (Y – X)	2. X' ∪ Y
C. (X ∩ Y)'	3. X ∩ Y'
D. (X ∩ Y)	4. X ∩ Y

(X, Y are two non-empty subsets)

Codes:

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

93. The sum of all the possible proper subsets of A and that of B is equal to 158. What is the sum of all elements of A and that of B?
(a) 8 (b) 10
(c) 11 (d) 12

94. If l, m are real and $l \neq m$, what is the nature of the roots of the equation $(l - m)x^2 - 5(l + m)x - 2(l - m) = 0$?
(a) Real and equal (b) Unreal and equal
(c) Real and unequal (d) Unreal and unequal

95. If $a^2 = by + cz$, $b^2 = cz + ax$, $c^2 = ax + by$; what is the value of $\left(\frac{x}{a+x} + \frac{y}{b+y} + \frac{z}{c+z}\right)$
(a) $\left(\frac{1}{a} + \frac{1}{b} + \frac{1}{c}\right)$ (b) 1
(c) 0 (d) –1

96. The sum of the roots of the equation $5x^2 + (p + q + r)x + pqr = 0$, is equal to zero. What is the value of the expression $p^3 + q^3 + r^3$?
(a) 0 (b) 1
(c) pqr (d) $3pqr$

97. The numerator, of a fraction is $6x + 1$ and its denominator is $7 - 4x$. For what value of x is the fraction always improper?
(a) $x < \frac{3}{5}$ (b) $x \leq \frac{3}{5}$
(c) $x > \frac{3}{5}$ (d) $x \geq \frac{3}{5}$

98. What is the value of $\frac{1}{1+\sqrt{2}} + \frac{1}{\sqrt{2}+\sqrt{3}} + \frac{1}{\sqrt{3}+\sqrt{4}} \ldots$ 15 terms?
(a) 0 (b) 1
(c) 3 (d) 4

99. Under which one of the following conditions does the polynomial $x^2 + px + q$ (with p and q greater than zero) have its minimum value?
(a) $x = -p$ (b) $x = \frac{p}{2}$
(c) $x = -\frac{p}{2}$ (d) $x = -2p$

100. Let $x = 1 + \cfrac{1}{1 + \cfrac{1}{1 + \cfrac{1}{1 + \ldots\ldots\infty}}}$
Which one of the following is correct?
(a) $x^2 - x - 1 = 0$ (b) $x^2 + x - 1 = 0$
(c) $x^2 - x + 1 = 0$ (d) $x^2 + x + 1 = 0$

ANSWERS

1. (a)	2. (b)	3. (d)	4. (c)	5. (b)	6. (a)	7. (a)	8. (d)	9. (a)	10. (d)
11. (c)	12. (d)	13. (a)	14. (c)	15. (a)	16. (d)	17. (d)	18. (b)	19. (c)	20. (c)
21. (c)	22. (b)	23. (c)	24. (c)	25. (a)	26. (d)	27. (a)	28. (d)	29. (c)	30. (b)
31. (b)	32. (d)	33. (d)	34. (a)	35. (d)	36. (d)	37. (c)	38. (a)	39. (d)	40. (a)
41. (c)	42. (b)	43. (a)	44. (c)	45. (b)	46. (a)	47. (b)	48. (d)	49. (d)	50. (b)
51. (c)	52. (d)	53. (a)	54. (c)	55. (b)	56. (a)	57. (c)	58. (a)	59. (d)	60. (b)
61. (a)	62. (c)	63. (a)	64. (c)	65. (d)	66. (b)	67. (b)	68. (c)	69. (c)	70. (d)
71. (d)	72. (b)	73. (a)	74. (b)	75. (a)	76. (d)	77. (d)	78. (b)	79. (d)	80. (b)
81. (b)	82. (c)	83. (b)	84. (b)	85. (d)	86. (d)	87. (c)	88. (c)	89. (c)	90. (d)
91. (d)	92. (b)	93. (d)	94. (c)	95. (b)	96. (d)	97. (c)	98. (c)	99. (c)	100. (a)