PUNE MCA
Solved Paper 2007

Part-A

1. a and b are in the ratio 5 : 4. b and c are in the ratio 6 : 7, then $a : b : c$ is
   (a) 30 : 24 : 28
   (b) 5 : 10 : 7
   (c) 5 : 4 : 7
   (d) 15 : 12 : 14

2. Some pumps discharge at 50 kL a minute can irrigate 4 hec in 8 h. If the flow is 40 kL a minute, in what time can they irrigate 6 hec?
   (a) 15 h
   (b) 6 h and 40 min
   (c) 9 h
   (d) 9 h and 36 min

3. x men can do a piece of work in y days. How many men are required to do it in z days?
   (a) $\dfrac{zy}{x}$
   (b) $\dfrac{xy}{z}$
   (c) $\dfrac{xz}{y}$
   (d) $\dfrac{z}{(xy)}$

4. If $\dfrac{a}{b} = \dfrac{c}{d}$, then which of the following is not true?
   (a) $\dfrac{(a+3c)}{(b+3d)} = \dfrac{(a-b)}{(c-d)}$
   (b) $\dfrac{(a+c)}{(b+d)} = \dfrac{(a-c)}{(b-d)}$
   (c) $\dfrac{(a+b)}{(c+d)} = \dfrac{(a-b)}{(d-c)}$
   (d) $\dfrac{(a+b)}{(c+d)} = \dfrac{(b-a)}{(c-d)}$

5. A student is required to get 40% marks to pass. He gets 253 marks and fails by 27 marks. The total marks of the exam is
   (a) 600
   (b) 500
   (c) 700
   (d) 800,

6. A's income is 20% more than that of B's. Find by what per cent B's income is less than that of A?
   (a) 16.67%
   (b) 20%
   (c) 25%
   (d) 10.75%

7. The population of a town is increased by 10% in a year and then decreased by 10% in the next year. After the second year by what per cent is the population more or less than that of 2 yr ago?
   (a) no increase
   (b) 1% more
   (c) 1% less
   (d) 10% more·

8. A radio is sold at ₹ 1150. Repairing charges amounted to ₹ 50. If there is a profit of 15%, find cost price.
   (a) ₹ 1000
   (b) ₹ 950
   (c) ₹ 1050
   (d) ₹ 1045

9. The cost price of 10 articles is the same as the selling price of 8 articles. Find the profit per cent.
   (a) 25%
   (b) 20%
   (c) 30%
   (d) 10%

10. An article was sold at a gain of 8%. If it had been sold for 10 paise more, the gain would have been 18%. Find the cost price.
    (a) ₹ 100
    (b) ₹ 1
    (c) 10 Paise
    (d) ₹ 10

11. Badri can do a piece of work in 10 days. Sriram can do the same work in 8 days. Both work together for 2 days and Badri stops working. How long will it take Sriram to complete the remaining work?
    (a) 18 days
    (b) 16 days
    (c) 4.4 days
    (d) 6 days

12. If 9 men and 5 boys do in a day as much work as 5 men and 11 boys. How many men can do the work of 9 boys?
    (a) 6 men
    (b) 9 men
    (c) 12 men
    (d) 8 men

13. I have to be at a place at 2 pm. I find that if I walk at 4 km/h, I can reach the place at 2 : 05 pm and if at 5 km/h, I can reach the place at 1 : 50 pm. How far I have to go?
    (a) 4 km
    (b) 5 km
    (c) 6 km
    (d) 1 km

14. I had to walk 18 km to reach a place X. After walking a few km at 4 km/h, I changed my speed to 3 km/h. If I took 5 h to reach X, at what distance from X, I changed my speed?
    (a) 9 km
    (b) 3 km
    (c) 12 km
    (d) 6 km

15. The interest on a certain loan is ₹ 100 in the first year and ₹ 205 in the first two years. What is the rate percentage?
    (a) 5%
    (b) 4%
    (c) 10%
    (d) 6%

16. The difference between SI and CI for two years on a certain sum of money at 4% is ₹ 160. Find the sum.
    (a) 1.5 lakhs
    (b) 1 lakh
    (c) 0.75 lakh
    (d) 2 lakhs

17. What sum of money will amount to ₹ 1352 in two years at 4% compound interest?
    (a) ₹ 1000
    (b) ₹ 1150
    (c) ₹ 1250
    (d) ₹ 1200

18. How many terms of the series $8 + 10 + 12 + \ldots$ must be taken to make 228?
    (a) 12
    (b) 11
    (c) 10
    (d) 13

19. The sum of three numbers in AP is 51 and the product of the extremes is 273. Find the greatest number in the AP.
    (a) 17
    (b) 21
    (c) 13
    (d) 19

20. Find the next number in the sequence

    2, 5, 10, 17, 28, 41,...
    (a) 58
    (b) 54
    (c) 50
    (d) 56

21. If $4x - x^2 - 2b < 0$ for all values of x, then
    (a) $b > 4$
    (b) $b < 2$
    (c) $b > 2$
    (d) $b > 3$

22. The number of mappings from $\{a, b, c\}$ to $\{x, y\}$ is
    (a) 3
    (b) 6
    (c) 8
    (d) 9

23. If $f = \{(6, 2), (5, 1)\}$, $g = \{(2, 6), (1, 5)\}$, then fog is equal to
    (a) $\{(6, 6)(5, 5)\}$
    (b) $(2, 2)(1, 1)$
    (c) $\{(6, 2)(2, 6)(5, 1)(1,5\}$
    (d) None of these

24. If $A = \{1, 2, 3\}$, $B = \{a, b, c, d\}$. The number of subsets in the Cartesian product of A and B is
    (a) 2^{12}
    (b) 2^7
    (c) 12
    (d) 7

25. The solution of the equation $x^{2/3} - 3x^{1/3} + 2 = 0$ is
    (a) 1, 2
    (b) 1, 8
    (c) 2, 6
    (d) 1, 4

26. $f(x) = ax^2 + bx + c$, then the solution of $f(x) = 0$ is
    (a) AM of the roots of $f(x) = 0$
    (b) GM of the roots of $f'(x) = 0$
    (c) HM of the roots of $f(x) = 0$
    (d) None of the above

27. Which of the following may be true for a quadratic equation (α is real)?
    (a) If α is a root, $1/\alpha$ is also a root
    (b) If α is a root, $-\alpha$ is also a root
    (c) If α is a root, $i\alpha$ is also a root
    (d) If $i\alpha$ is a root, $-i\alpha$ is also a root

28. If α and β are the roots of $|x^2 + x + 5| + 6x + 1 = 0$, then $\alpha + \beta$
    (a) 7
    (b) -7
    (c) 5
    (d) -5

29. If $a + b + c = 0$, then one root of the equation $ax^2 - bx + c = 0$ is
    (a) $-\dfrac{b}{a}$
    (b) $-\dfrac{c}{a}$
    (c) $\dfrac{a + c}{a}$
    (d) $\dfrac{a + b}{a}$

30. If a and b are positive integers such that $a^3 - b^3$ is a prime number, then $a^3 - b^3$ is
    (a) $a^2 + ab + b^2$
    (b) $a^2 - ab + b^2$
    (c) $a + b$
    (d) $a - b$

31. The remainder in the divisor of 3^{40} by 23 is
    (a) 13
    (b) 12
    (c) 14
    (d) 15

32. $(12! + 1)$ is divisible by
    (a) 11
    (b) 13
    (c) 14
    (d) 7

33. If two dice are tossed, the probability of getting the sum atleast 5 is
    (a) $\dfrac{7}{12}$
    (b) $\dfrac{11}{12}$
    (c) $\dfrac{1}{2}$
    (d) $\dfrac{5}{6}$

34. A and B play a game of dice. A throws the dice first. The person who first gets a 6 is the winner. What is the probability that A wins?
    (a) $\dfrac{6}{11}$
    (b) $\dfrac{1}{2}$
    (c) $\dfrac{5}{6}$
    (d) $\dfrac{1}{6}$

35. If $A = \begin{pmatrix} 2 & 3 \\ 1 & 2 \end{pmatrix}$, then which of the following is true?
    (a) $A^2 - 4A + I = O$
    (b) $A^2 + 4A + I = O$
    (c) $(A - 4I)(A + I) = O$
    (d) $(A + 4I)(A - I) = O$

36. A is a square matrix of order 3; then which of the following is not true? $|A|$ means determinant
    (a) $|A + A'| = |A| + |A'|$
    (b) $|A * A| = |A||A|$
    (c) $|kA| = k^3|A|$, where k is a constant.
    (d) $|-A| = -|A|$

37. If $A = \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 2a & 2b & -1 \end{pmatrix}$, then A^2 is
    (a) null matrix
    (b) unit matrix
    (c) A
    (d) $-A$

38. If AB is a zero matrix, then
    (a) $A = O$ or $B = O$
    (b) $A = O$ and $B = O$
    (c) It is not necessary that either A or B should be O
    (d) None of the above

39. MICR code is used in
    (a) letters
    (b) cheques
    (c) punched cards
    (d) magnetic tapes

40. In evaluating expressions the following priorities are used. Integer/division (/) and multiplication (*) have same priority but higher than addition (+) and subtraction (−) which have same priority. Left associativity is used for operators. Find the value of the following integer arithmetic expression.
    (7 mod) *5/2 + 10/3* 8 + 2
    mod operator represents modulus operation, i.e., remainder of division.
    (a) 42
    (b) 28
    (c) 4
    (d) 31

Part-B

Directions (Q. Nos. 41-46) *Read the following information carefully and answer the questions.*
There is a six floor apartment complex in Chennai. There are two flats in each floor. The following persons live in this complex. They are

(i) Kumar	(ii) Ram
(iii) Joseph	(iv) Singh
(v) Naveen	(vi) Siva
(vii) Abhi	(viii) Abdul
(ix) Amar	(x) Akbar
(xi) Antoney	(xii) Jain

No more than two persons live in the same apartment. Some apartments may be empty. Ram and his roommate live two floors above Abdul and his roommate Abhi Kumar lives alone, three floors below Siva and two floors below Antoney. Singh lives one floor below Abdul and Abhi.

Joseph lives three floors above the floor on which Amar and Akbar have single apartments. Jain and Naveen live in single apartment two floors below Singh.

41. Which of the following list of persons named below in the correct order, going from bottom floor to the Top?
   (a) Jain, Amar, Singh, Abdul, Ram, Abhi
   (b) Naveen, Amar, Kumar, Abhi, Joseph, Ram
   (c) Jain, Akbar, Joseph, Antoney, Ram, Abhi
   (d) Ram, Antoney, Abdul, Singh, Akbar, Jain

42. Which of the following pair must live in the same floor?
   (i) Joseph and Antoney
   (ii) Kumar and Singh
   (iii) Abdul and Ram
   (a) (i) only
   (b) (i) and (ii) only
   (c) (ii) and (iii) only
   (d) (i) and (iii) only

43. Ram's roommate assuming to be one of these persons is
   (a) Joseph
   (b) Singh
   (c) Siva
   (d) Naveen

44. Jain lives on the
   (a) first floor
   (b) second floor
   (c) third floor
   (d) fourth floor

45. An empty apartment may be found in the
   (a) fourth floor only
   (b) fifth floor only
   (c) third or sixth but not both
   (d) fourth or sixth or both

46. Mohan lives with a roommate. His roommate could be any one of the following except
   (a) Siva   (b) Singh   (c) Antoney   (d) Akbar

Directions (Q. Nos. 47-50) *Read the following information carefully and answer the questions.*
   (i) A causes B or C but not both
   (ii) F occurs only if B occurs
   (iii) D occurs if B or C occurs
   (iv) E occurs only if C occurs
   (v) J occurs only if E or F occurs
   (vi) D occurs G or H or both occur
   (vii) H occurs if E occurs
   (viii) G occurs if F occurs

47. If A occurs, which of the following may occur?
   (i) F and G   (ii) E and H
   (iii) D
   (a) (i), (ii) and (iii)
   (b) (i) and (iii) or (ii) and (iii) but not both
   (c) (i) only
   (d) (iii) only

48. If B occurs which must occur?
   (a) F and G   (b) D and G
   (c) D   (d) G and H

49. If J occurs which must have occurred?
   (a) E   (b) Both B and C
   (c) Either B or C   (d) Both E and F

50. Which may occur as a result of a cause not mentioned?
   (i) D   (ii) A
   (iii) F
   (a) (i) only
   (b) (ii) only
   (c) (i) and (ii) only
   (d) (ii) and (iii) only

Directions (Q. Nos. 51-53) *Read the following information carefully and answer the questions.*
A cricket team has four bowlers named Singh, Srinath, Prasad and Gupta.
Each is best known for bowling one type of ball.
Half Spin, Medium Pace, Fast Ball, Leg Spin
Each is also used one style of delivery
Short run up, long run up, side run up, medium run up
Prasad is best known for Fast Ball
Neither Srinath or Gupta uses long run up
The bowler who uses medium run up is best known for Half Spin
Gupta is best known for Leg Spin
Singh uses short run up

51. Which of the following correctly matches a bowler with his best known ball and style of delivery?
   (a) Singh-Medium Pace-Long run up
   (b) Prasad-Fast Ball-Side run up
   (c) Srinath-Half Spin-Medium run up
   (d) Gupta-Leg Spin-Medium run up

52. In a four game series, the Captain of the team decides to use Half Spin first, who uses long run up second, Medium pacer third. In which order the bowlers appear?
   (a) Prasad, Srinath, Gupta, Singh
   (b) Srinath, Prasad, Singh, Gupta
   (c) Prasad, Srinath, Singh, Gupta
   (d) Srinath, Prasad, Gupta, Singh

53. During the game, if the starting bowler is ineffective he will be replaced by another bowler. All the following are possible except.
   (a) medium pacer replaced by a bowler who uses short run up
   (b) leg spinner is replaced by Prasad
   (c) Singh is replaced by half spinner
   (d) fast ball bowler is replaced by a bowler with side run up

54. Find the remainder of 3213117 divided by 3.
(a) 1   (b) 2
(c) 3   (d) 0

55. The smallest angle in degree between the hours and minutes needles of a clock when the time is 12 h 30 min is
(a) 180°
(b) 165°
(c) 196°
(d) 150°

56. The collating sequence of five alphabets is W, P, Z, A and E. Given four strings
(i) AZPWW   (ii) APAEP
(iii) ZPAPA   (iv) ZAPWE
Which will be the first string of the above collating sequence?
(a) (i)   (b) (ii)
(c) (iii)   (d) (iv)

57. How many numbers between 100 and 300 (inclusive) are divisible by 3?
(a) 100   (b) 66
(c) 76   (d) None of these

58. Which of the following figures has the largest area for the given circumference?
(a) Square   (b) Triangle
(c) Circle   (d) Ellipse

59. If $2 < r < 8$ and $1 < s < 5/2$, which of the following expresses all possible values of rs?
(a) $1 < rs < 5$ (b) $2 < rs < 20$
(c) $5/2 < rs < 8$ (d) $5/2 < rs < 20$

60. A pipe line of length x cm is cut into two segments such that the length of one segment is 2 cm more than three times the length of other segment. Which of the following is the length in cm of the longer segment?
(a) $\dfrac{(x+4)}{3}$ (b) $\dfrac{(3x+2)}{3}$
(c) $\dfrac{(x-2)}{4}$ (d) $\dfrac{(3x+2)}{4}$

61. 5×10^3 is what per cent of $\dfrac{1}{5} \times 10^2$?
(a) 2500%   (b) 25000%
(c) 20000%   (d) 24900%

62. The area of the circle whose centre is at (0,0) is 25 π. The circle passes through all the points except
(a) (−5, 0)   (b) (5, 0)
(c) (5, 5)   (d) (0, 5)

63. A classroom has r rows of desks with d desks in each row. On a particular day, when all pupils were present 3 seats were left vacant (one student per desk). The number of pupils in the class were
(a) $dr - 3$ (b) $d + r + 3$
(c) $dr + 3$ (d) $\dfrac{r}{d} + 3$

64. The length of a rectangle is increased by 50%. By what per cent the width has to be decreased to maintain the same area?
(a) 33.33%   (b) 50%
(c) 66.67%   (d) 150%

65. If the radius of a circle is 0.5 m how many revolutions does the wheel make per kilometre?
(a) 1000   (b) 2000
(c) $\dfrac{1000}{\pi}$ (d) $\dfrac{2000}{\pi}$

66. The average of 5, 10, 15 and x is 20. What is x?
(a) 20   (b) 25
(c) 45   (d) 50

67. What is the largest prime factor of 255?
(a) 15   (b) 5
(c) 51   (d) 17

68. In an Indo-American committee, 2/3 of the members are men and 3/8 of the men are Americans. If 3/5 of the committee members are Indians. What fraction of the members are American women?
(a) $\dfrac{3}{20}$ (b) $\dfrac{11}{60}$
(c) $\dfrac{5}{12}$ (d) $\dfrac{2}{5}$

69. If the sum of all the positive even integers < 1000 is A, what is the sum of all positive odd integers less than 1000?
(a) $A - 998$ (b) $A - 499$
(c) $A + 1$ (d) $A + 500$

70. A sequence of numbers begin 1, 1, 1, 2, 2, 3 and repeats this pattern for ever. What is the sum of 141st, 143rd and 145th number?
(a) 4   (b) 5
(c) 6   (d) 7

71. The product of the three hexadecimal numbers $2^{14} \times 8^2 \times 10^3$ could be
I. 10^8 II. 2^{20}
III. 8^{11} IV. 16^8
The correct answer is
(a) I only   (b) I and II
(c) IV only   (d) I and IV

72. In Boolean Algebra, given two variables A and B, find the value of $AB + A \wedge B + \wedge AB + \wedge A \wedge B$; $\wedge$ refers to the not symbol that follows
(a) 0   (b) 1
(c) $A + B$ (d) A

73. The following is a FORTRAN program segment
$I = 3$
$DO = 10 J = 2, 11, 4$
$10 I = I + J$
The value of I after this program segment will be
(a) 47   (b) 11
(c) 21   (d) None of these

74. $K = 0$
$DO\ 10\ I = 1, 10$
$DO\ 10\ J = 1, 5$
If odd (J), then $K = K + 1$ else $K = K - 1$
10 continue
Odd (J) is true, if J is odd number.
The value of K after this program segment will be
(a) 0   (b) 10
(c) 15   (d) 5

75. In a *C* language program segment *a*, *b* and *c* are integers
$a = 2, b = 1, c = 3$
The statement is print
$("\% d, \% d, \% d", a = b + c, b = a + c, c = a + b);$
The printed values are

(a) 4, 5, 3   (b) 4, 7, 11
(c) 8, 5, 3   (d) None of these

76. Which of the following is not a programming language?

(a) ADA   (b) LISP
(c) PL/I   (d) BEANS

77. Minimum number of camparisons required to find the largest of a given set of *N* numbers is

(a) *N*   (b) $N - 1$ (c) $N + 1$ (d) N^2

78. Consider the following *C* program segement

```
j = 0;
for (I = 1 ; I <= 10 ; I + +)
If (I mod 3) == 1), then j = j + 1;
else if (I mod 3) == 2), then j = j * 1
else j = 0 ;
```
mod returns the remainder of integer division.
The value of *j* after the loop will be

(a) 1   (b) 0
(c) 55   (d) None of these

79. Last in First out data structure is called

(a) Queue   (b) Tree
(c) Stack   (d) Graph

80. The binary number corresponding to the following decimal expression is $10 \times 256 + 12 \times 16 + 9$

(a) 110101001011   (b) 111101001011
(c) 101011101001   (d) 101011001001

81. A rectangle *l* cm long and *w* cm wide is made 3 cm longer. The area has increased by

(a) 3 *lw*   (b) 3 *w*
(c) 3 *l*   (d) $3l + 3w + 9$

82. City *X* is 200 miles East of city *Y* and city *Z* is 150 miles North of city *Y*. What is the shortest distance between city *X* and *Z*?

(a) 507   (b) 175   (c) 250   (d) 300

Directions (Q. Nos. 83-85) *Read the following information carefully and answer the questions.*
Family *A* has an annual income of 200000. Family *B* has an annual income of 500000. Family *C* has an annual income of 1000000.
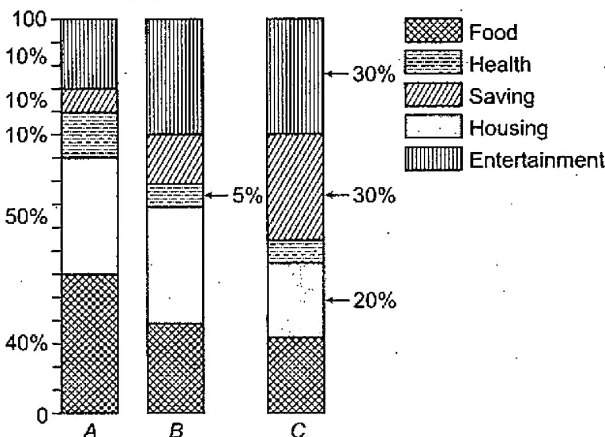
83. What per cent of total budget is spent by Family *A* on health in comparision to the per cent of total budget spent by Family *B* on health?

(a) Family *A* spent 200% more of its budget on health than did Family *B*.
(b) Family *B* spent 50% more of its budget on health than did Family *A*.
(c) The amount spent by the two families were unequal but the percentages of the totals were equal.
(d) Family *B* spent 5% less of its budget on health than did Family *A*.

**84.** What per cent of Family *C*'s budget went for housing and entertainment?

(a) 25%   (b) 50%   (c) 75%   (d) 33.13%

85. How does the food bill of Family *A* is compared with the food bill of Family *C*?

(a) Family *A* spent $2\frac{1}{2}$ times as much as did Family *C*.

(b) Family *C* spent $2\frac{1}{2}$ times as did Family *A*.

(c) Family *C* spent 1/2 as much for food as did Family *A*.
(d) Family *A* spent twice as much for food as Family *C*.

Directions (Q. Nos. 86-90) *Read the following information carefully and answer the questions.*
Refer to the following graph.
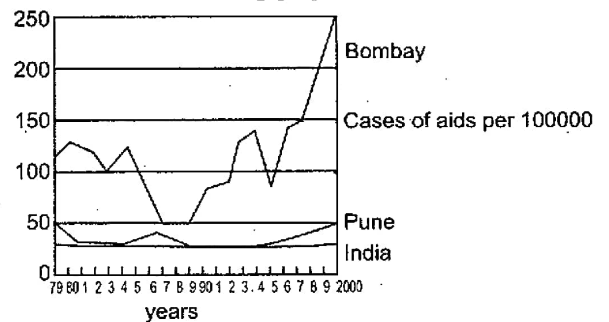
86. How many cases of Aids per 100000 population were reported in Bombay 1989?

(a) 50   (b) 60   (c) 65   (d) 150

87. During what year there was the greatest difference between the cases per 100000 of Aids in Pune and the rest of the country?

(a) 1979   (b) 1990   (c) 2000   (d) 1997

88. When did Bombay experience Sharpest rise in Aids?

(a) 1987-88   (b) 1999-2000
(c) 1992-93   (d) 1995-97

89. During which year Pune and India have the same number of Aids patients per 100000?

(a) 1979   (b) 1986   (c) 1999   (d) 1992

90. In 2000, how many cases of Aids per 1000 population was there in Pune?

(a) 50   (b) 5   (c) 0.5   (d) 5.5

Directions (Q. Nos. 91-96) *Read the following information carefully and answer the questions.*
Ocean water plays an indispensable role in supporting life. The great ocean basins hold about 300 million cubic miles of water. From this vast amount, about 80000 cu miles of water are sucked into the atmosphere each year by evaporation and returned by precipitation and

drainage to the ocean. More than 24000 cu miles of rain descend annually upon the continents. This vast amount is required to replenish the lakes and streams, springs and water tables on which all flora and fauna are dependent. Thus, the hydrosphere permits organic existence.

The hydrosphere has strange characteristics because water has properties unlike those of any other liquid. One anomaly is that water upon freezing expands by about 9 per cent, whereas most liquids contract on cooling. For this reason, ice floats on water bodies instead of sinking to the bottom. If the ice sank, the hydrosphere would soon be frozen solidly, except for a thin layer of surface melt water during the summer season. Thus, all aquatic life would be destroyed and interchange of warm and cold currents, which moderates climate, would be notably absent.

Another outstanding characteristics of water is that water has a heat capacity which is the highest of all liquids and solids except ammonia. This characteristic enables the oceans to absorb and store vast quantities of heat, thereby often preventing climatic extremes. In addition, water dissolves more substances than any other liquid. It is this characteristic which helps make oceans a great storehouse of minerals which have been washed down the continents. In several areas of the world these minerals are being commercially exploited. Solar evaporation of salt is widely practised, potash is extracted from the Dead Sea and magnesium is produced from sea water along the American Gulf Coast.

91. The author's main purpose in this passage is to
(a) describe the properties and uses of water.
(b) illustrate the importance of conserving water.
(c) explain how water is used in commerce and industry.
(d) compare water with other liquids.

92. According to the passage, fish can survive in the oceans because
(a) they do not need oxygen
(b) ice floats
(c) evaporation and condensation create a water cycle
(d) there are currents in the oceans

93. Which of the following characteristics of water does the author mention in the passage?
I. Water expands when it is frozen.
II. Water is a good solvent.
III. Water can absorb heat.
(a) I only   (b) II only
(c) I and II only   (d) I, II and III

94. According to the passage, the hydrosphere is not
(a) responsible for all forms of life
(b) able to modify weather
(c) a source of natural resources
(d) in danger of freezing over

95. The author's tone in the passage can be best described as
(a) dogmatic   (b) dispassionate
(c) speculative   (d) biased

96. The author organises the passage by
(a) comparison and contrast
(b) juxtaposition of true and untrue ideas
(c) general statements followed by examples
(d) hypothesis and proof

Directions (Q. Nos. 97-100) *Read the following information carefully and answer the questions.*

Observe the dilemma of the fungus : it is a plant but it possesses no chlorophyll. While all other plants put the Sun's energy to work for them combining the nutrients of ground and air into the body structure, the chlorophylless fungus must look elsewhere for an energy supply. It finds it in those other plants which, having received their energy free from the Sun, relinquish it at some point in their cycle either to animals (like us humans) or to fungi.

In this search for energy the fungus has become the Earth's major source of rot and decay. Wherever you see mold forming on a piece of bread or a pile of leaves turning to compost or a blown-down tree becoming pulp on the ground, you are watching a fungus eating. Without fungus action the Earth would be piled high with the dead plant life of past centuries. In fact, certain plants life of past centuries. In fact certain plants which contain resins that are toxic to fungi will last indefinitely; specimens of the redwood, for instance, can still be found resting on the forest floor centuries after having been blown down.

97. Which of the following words best describes the fungus as depicted in the passage?
(a) Unevolved   (b) Sporadic
(c) Enigmatic   (d) Parasitic

98. The passage states all the following about fungi, except
(a) they are responsible for the decomposition of much plant life.
(b) they cannot live completely apart from other plants.
(c) they are vastly different from other plants.
(d) they are poisonous to resin-producing plants.

99. The author's statement that "You are watching a fungus eating" is best described as
(a) figurative   (b) ironical
(c) parenthetical   (d) erroneous

100. The author is primarily concerned with
(a) warning people of the dangers of fungi
(b) writing a humorous essay on fungi
(c) relating how most plants use solar energy
(d) describing the actions of fungi

Answers with Solutions

1. (d) $a : b = 5 : 4$ and $b : c = 6 : 7$
$\Rightarrow$ $a : b = 15 : 12$ and $b : c = 12 : 14$
$\therefore$ $a : b : c = 15 : 12 : 14$

2. (a) 4 hec land is irrigated for 8 h with the speed of 50 kL/min, so quantity of water required
$= 8 \times 60 \times 50 \times kL = 24000\ kL$

$\Rightarrow$ 6 hec requires $= \dfrac{24000}{4} \times 6$
$= 36000\ kL$ Water

Hence, time taken by the pump with speed 4 kL/min
$= \dfrac{36000}{40 \times 60}\ h = 15\ h$

3. (b) To do a piece of job in y days x men are required, so in z days we require $\dfrac{xy}{z}$ men.

Alternate method

By formula, $M_1 D_1 = M_2 D_2$

$$x \times y = M_2 \times Z$$

$$\Rightarrow \qquad M_2 = \dfrac{xy}{z}$$

4. (a) $\dfrac{a}{b} = \dfrac{c}{d} \neq \dfrac{a+3c}{b+3d} = \dfrac{a-b}{c-d}$

Rest holds by componendo-dividendo.

5. (c) Suppose, total marks of the exam $= x$

Then, $x \times \dfrac{40}{100} = 253 + 27 = 280$

$$\Rightarrow \qquad x = 700$$

6. (a) If income of B is ₹ 100, then income of A will be $100 + 20 = 120$.

Hence, required less %

$$= \dfrac{20}{120} \times 100 = \dfrac{50}{3} = 16.67\%$$

7. (c) Suppose, initial population of the village $= 100$

Then, after 1 yr it becomes $= 100 + 100 \times \dfrac{10}{100} = 110$

After 2 yr it will become $= 110 - 110 \times \dfrac{10}{100} = 99$

So, population becomes $= \dfrac{100 - 99}{100} \times 100 = 1\%$ less

8. (b) If cost price of the radio is ₹ x and there is 15% profit.

Then, $1150 = (x + 50) \times \left(1 + \dfrac{15}{100}\right) = (x + 50)\left(\dfrac{115}{100}\right)$

$$\Rightarrow \qquad x + 50 = 1000$$

$$\Rightarrow \qquad x = ₹\ 950$$

9. (a) If cost price of 10 articles be ₹ x, then the selling price of 10 articles will be $\dfrac{10x}{8} = ₹\ \dfrac{5x}{4}$

$$\therefore \qquad \text{Profit } \% = \dfrac{\dfrac{5x}{4} - x}{x} \times 100\%$$

$$= 25\%$$

10. (b) As, $18\% - 8\% = 10\% \Rightarrow$ Increment of 10 paise,

So, $100\% \Rightarrow 10 \times 10$ paise $= ₹\ 1$

11. (c) After 2 days Badri and Sriram have completed $2\left(\dfrac{1}{10} + \dfrac{1}{8}\right) = \dfrac{9}{20}$ part of the work remaining $1 - \dfrac{9}{20} = \dfrac{11}{20}$ part will be completed by Sriram in $\dfrac{11}{20} \times 8 = \dfrac{11 \times 2}{5} = \dfrac{22}{5} = 4.4$ days

12. (a) If 1 man is equivalent to x boys, then 9 men and 5 boys and 5 men and 11 boys have same capacity, so

$$9x + 5 = 5x + 11$$

$$\Rightarrow \qquad 4x = 6 \Rightarrow x = \dfrac{3}{2}$$

$$\Rightarrow \qquad \dfrac{3}{2} \text{ boys} = 1 \text{ man}$$

$$\Rightarrow \qquad 9 \text{ boys} = \dfrac{9 \times 2}{3} = 6 \text{ men}$$

13. (b) If distance of the place is x km and t is the time required to reach there on time, so we have

$$\dfrac{x}{4} = t + \dfrac{5}{60}$$

and $\qquad \dfrac{x}{5} = t - \dfrac{10}{60}$

$$\Rightarrow \qquad \dfrac{x}{4} - \dfrac{x}{5} = \dfrac{15}{60} \Rightarrow \dfrac{x}{20} = \dfrac{1}{4}$$

$$\Rightarrow \qquad x = 5 \text{ km}$$

14. (d) Let d be the distance from x where the speed was changed;

So, $\qquad \dfrac{18 - d}{4} + \dfrac{d}{3} = 5$

$$\dfrac{54 + d}{12} = 5$$

$$\Rightarrow \qquad 54 + d = 60$$

$$d = 6 \text{ km}$$

15. (a) Interest amount for 1 yr $= 100$

As in the second year we have to pay interest on the interest of the previous year also, hence ₹ 205 $- 2 \times 100 = 5$ is the interest of ₹ 100 for one year.

Hence, rate percentage is 5%.

16. (b) If x is the sum of money, then 4% of 4% of $x = 160$

$$\Rightarrow \qquad \dfrac{4 \times 4 \times (x)}{100 \times 100} = 160$$

$$\Rightarrow \qquad x = 100000 = 1 \text{ lakh}$$

17. (c) If x is the sum of money, then

$$1352 = x\left(1 + \dfrac{4}{100}\right)^2 \qquad \left[\because a = p\left(1 + \dfrac{r}{100}\right)^n\right]$$

$$\Rightarrow \quad 1352 = x\left(\dfrac{26 \times 26}{25 \times 25}\right)$$
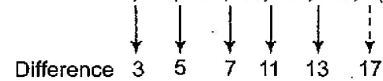
$$\Rightarrow \qquad x = 1250$$

18. (a) $8 + 10 + 12 + \ldots = 228$ requires in terms, then as it is an AP with first term 8 and common difference 2, so

$$228 = \dfrac{n}{2}[2 \times 8 + (n - 1) \times 2]$$

$$\Rightarrow \qquad 456 = n(2n + 14)$$

$$\Rightarrow \qquad n(n + 7) = 228 = 12 \times 19 = 12(12 + 7)$$

$$\Rightarrow \qquad n = 12$$

19. (b) Let $a - d, a, a + d$ be the three numbers in AP

$$\Rightarrow \quad \text{Their sum} \quad 3a = 51 \Rightarrow a = 17$$

Now, $\qquad (17 - d)(17 + d) = 273$

$$\Rightarrow \qquad 289 - d^2 = 273 \Rightarrow d^2 = 16$$

$$\Rightarrow \qquad d = \pm 4$$

So, greatest number is $17 + 4 = 21$

20. (a) $\qquad 2,\ 5,\ 10,\ 17,\ 28,\ 41,\ (41 + 17 = 58)$

Difference $\quad 3 \quad 5 \quad 7 \quad 11 \quad 13 \quad 17$

Here, difference of consecutive numbers are consecutive odd prime numbers.

Hence, next number is $41 + 17 = 58$

21. (c) Given, $4x - x^2 - 2b < 0, \forall x \in R$

$$\Rightarrow \qquad x^2 - 4x + 2b > 0 \ \forall x \in R$$

which holds for $D < 0$

$$\because \qquad D = B^2 - 4AC$$

$$\Rightarrow \qquad (-4)^2 - 4 \times 1 \times 2b < 0$$

$$\Rightarrow \qquad 16 < 8b \quad \Rightarrow \quad b > 2$$

22. (c) The number of mappings from $\{a, b, c\}$ to $\{x, y\}$ is $= 2^3 = 8$

23. (b) $\qquad f = \{(6, 2), (5, 1)\}$

$$g = \{(2, 6), (1, 5)\}$$

$$\Rightarrow \qquad fog = \{(2, 2), (1, 1)\}$$

As $fog(x) = f(g(x))$

24. (a) As, $\qquad n(A) = 3$ and $n(B) = 4$

So, $\quad n(A \times B) = n(a) \times n(B) = 3 \times 4 = 12$

$$\Rightarrow \quad \text{Number of subsets of } n(A \times B) = 2^{12}$$

25. (b) $\qquad x^{2/3} - 3x^{1/3} + 2 = 0$

Let $\qquad\qquad\qquad x^{1/3} = y$

$\Rightarrow \qquad\qquad y^2 - 3y + 2 = 0$

$\Rightarrow \qquad\qquad (y - 2)(y - 1) = 0$

$\qquad\qquad\qquad\qquad y = 1, 2$

$\Rightarrow \qquad\qquad x^{1/3} = 1, 2 \Rightarrow x = 1, 8$

26. (a) $f(x) = ax^2 + bx + c$

Roots of $f(x) = 0$ are α and β, then

$$\alpha + \beta = -\frac{b}{a} \text{ and } \alpha\beta = \frac{c}{a}$$

$f'(x) = 2ax + b$

$f'(x) = 0$

$\Rightarrow \qquad x = -\frac{b}{2a} = \frac{\alpha + \beta}{2}$

Hence, root of $f'(x) = 0$ is the arithmetic means of roots of $f(x) = 0$.

27. (d) As complex roots occur in conjugate pairs; so if one root is $i\alpha$, then other root will be $-i\alpha$.

28. (b) $|x^2 + x + 5| + 6x + 1 = 0$

$\Rightarrow \qquad x^2 + 7x + 6 = 0 \qquad\qquad …(i)$

As, $x^2 + x + 5 = \left(x + \frac{1}{2}\right)^2 + \frac{19}{4} > 0$

$\therefore \quad |x^2 + x + 5| = x^2 + x + 5$

If α and β are the roots of Eq. (i), then $\alpha + \beta = -7$

29. (b) Given, $a + b + c = 0 \qquad\qquad …(i)$

and equation is

$\qquad\qquad ax^2 - bx + c = 0 \qquad\qquad …(ii)$

On putting $\quad x = -1$ in Eq. (ii), we get

$\qquad\qquad a(-1)^2 - b(-1) + c = 0$

$\Rightarrow \qquad\qquad a + b + c = 0$

$\Rightarrow \qquad\qquad$ Relation (i) is satisfied

$\Rightarrow \qquad\qquad -1$ is one root of Eq. (ii).

Let other root is β.

Then, product of roots

$$-1 \times \beta = \frac{c}{a}$$

$\Rightarrow \qquad\qquad\qquad \beta = -\frac{c}{a}$

30. (a) $a^3 - b^3 = (a - b)(a^2 + ab + b^2)$

As, $a^3 - b^3$ is a prime number, hence, $a - b = 1$

So, $a^3 - b^3 = a^2 + ab + b^2$

31. (a) $3^{40} = 3 \times 3^{39} = 3 \times (27)^{13}$

$= 3 \times (23 + 4)^{13} = 3[M(23) + 4^{13}]$

$= 3[M(23) + 3 \times (64)^4]$

$= 3[M(23) + 3 \times (69 - 5)^4]$

$= 3[M(23) + 3 \times (5)^4]$

$= [M(23)] + 9 \times 625$

$= M(23) + 9 \times (M(23) + 4) = M(23) + 36$

$= M(23) + 23 \times 1 + 13$

$= M(23) + 13$

So, remainder is 13.

32. (b) By Wilson's theorem, if p is a prime number, then $(p - 1)! + 1$ is divisible by p.

Hence $(13 - 1)! + 1$, i.e., $12! + 1$ is divisible by 13.

33. (d) Total number of tosses when throwing two dices = 36

Number of unfavourable cases = 6,

i.e., $\qquad (1, 1), (1, 2), (1, 3), (2, 1), (2, 2), (3, 1)$

So, favourable cases = $36 - 6 = 30$

So, $\qquad$ probability $= \frac{30}{36} = \frac{5}{6}$

34. (a) A will win the game in first throw, third throw, fifth throw, i.e., in odd throw provided the even numbered throw is lost by B. Hence, the required probability is,

$P(A) = \frac{1}{6} + \frac{5}{6} \times \frac{5}{6} \times \frac{1}{6} + \frac{5}{6} \times \frac{5}{6} \times \frac{5}{6} \times \frac{5}{6} \times \frac{1}{6} + …$

$= \frac{1}{6}\left[1 + \left(\frac{25}{36}\right)^2 + \left(\frac{25}{36}\right)^4 + …\right]$

$= \frac{\frac{1}{6}}{1 - \frac{25}{36}} = \frac{\frac{1}{6}}{\frac{11}{36}} = \frac{6}{11}$

Note Probability of getting 6 in a throw from dice is 1/6.

35. (a) $A = \begin{pmatrix} 2 & 3 \\ 1 & 2 \end{pmatrix}$

Characteristic equation,

$\Rightarrow \quad |A - \lambda I| = \begin{vmatrix} 2 - \lambda & 3 \\ 1 & 2 - \lambda \end{vmatrix} = 0$

$\Rightarrow \qquad\qquad (2 - \lambda)^2 - 3 = 0$

$\Rightarrow \qquad\qquad \lambda^2 - 4\lambda + 1 = 0$

By Cayley Hamilton theorem, "every square matrix satisfies its characteristic equation"

$\Rightarrow \qquad\qquad A^2 - 4A + I = O$

36. (a) $|A + A'|$ is not necessarily equal to $|A| + |A'|$

but $\qquad |A * A| = |A| \cdot |A|$,

$\qquad\qquad |kA| = k^3 |A|$

and $\qquad |-A| = (-1)^3 |-A| = -|A|$ are true.

37. (b) $A^2 = \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 2a & 2b & -1 \end{pmatrix} \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 2a & 2b & -1 \end{pmatrix}$

$\Rightarrow A^2 = \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix} = I$

$\Rightarrow A^2$ is a unit matrix.

38. (c) $AB = 0$ does not imply that either matrix A or matrix B will be null matrix.

e.g., $\begin{pmatrix} 1 & 0 \\ 0 & 0 \end{pmatrix} \begin{pmatrix} 0 & 0 \\ 1 & 0 \end{pmatrix} = \begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix}$

39. (b) MICR code is used in cheques.

40. (b) $(7 \bmod 3) * \frac{5}{2} + \frac{10}{3} * 8 + 2$

$= 1 * \frac{5}{2} + \frac{10}{3} * 8 + 2$

$= \frac{5}{2} + \frac{10}{3} * 8 + 2$

$= 2 + \frac{10}{3} * 8 + 2$

$= 2 + 3 * 8 + 2$

$= 2 + 24 + 2$

$= 28$

Solutions (Q. Nos. 41-46)

Floor	Name of Residents
6	Ram, Siva
5	Joseph, Antoney
4	Abdul, Abhi
3	Singh, Kumar
2	Amar, Akbar
1	Jain, Naveen

41. (b) From the prepared chart, option in b is the correct order.

42. (b) Pairs in I and II are on the same floor.

43. (c) Siva is the roommate of Ram.

44. (a) Jain and Naveen live on the first floor.

45. (d) Fourth and sixth floor have Abdul and Abhi as roommates and Ram and Siva as roommates respectively, so they have empty apartments on their floors.

46. (a) Siva already has a roommate in form of Ram, so he cannot have Mohan as roommate.

47. (b) If A occurs, then B or C occur.
If B or C occurs, then D occur.
As only one of them from B and C can occur, so if B occurs, then so does F
and if F occurs, then so does G
Also, if C occurs, then so does E
and if E occurs then so does H
$\Rightarrow$ Alongwith D, either F and G occurs or E and H occurs but not both.

48. (a) From above given conditions if B occurs, then so does F and G.

49. (c) J occur so E or F has occured E or F has occured so either B or C has occured.

50. (b) A causes occurence of others but it is itself not caused due to others.

Solutions (Q. Nos. 51-53)

Run up →	short	long	side	medium	
Half Spin	×	×	×	Srinath	✔
Medium Pace	Singh				×
Fast Ball		Prassd			×
Leg Spin			Gupta		×

Singh Prassd

51. (c)

52. (b)

53. (a) Medium pacer uses short run-up.

54. (d) Sum of the digits of number 3213117 is 18, which is divisible by 3, hence the number is divisible by 3. So remainder is 0.

55. (b) At 12:30; $5\frac{1}{2}$ parts of the whole 12 parts of the clock lie between minute hand and hour hand, hence angle between them
$$= \frac{5\frac{1}{2}}{12} \times 360°$$
$$= \frac{11}{2 \times 12} \times 360° = \frac{360° \times 2 \times 12}{11}$$
$$= 165°$$

56. (d) ZAPWE is the collating sequence appearing first.

57. (d) The numbers divisible by 3 lying between 100 and 300 both inclusive is
$$\left[\frac{300}{3}\right] - \left[\frac{99}{3}\right] = 100 - 33 = 67$$

58. (c) As the number of sides increase for same perimeter area of the geometric figures increases.
e.g., $\quad 4a = 2\pi r \Rightarrow a = \frac{\pi r}{2}$
$$\Rightarrow \quad a^2 = \frac{\pi^2 r^2}{4} = \pi r^2 \left(\frac{\pi}{4}\right)$$
$$\Rightarrow \quad a^2 < \pi r^2$$
So, circle has the largest area.

59. (b) $2 < r < 8$ and $1 < s < \frac{5}{2}$
$$\Rightarrow \quad 2 \times 1 < rs < 8 \times \frac{5}{2}$$
$$\Rightarrow \quad 2 < rs < 20$$

60. (d) If length of longer segment is y, then we have, $y = 3z + 2$; z being the length of smaller segment.
But as $\quad y + z = x \Rightarrow z = x - y$
$$\Rightarrow \quad\quad y = 3(x - y) + 2$$
$$\Rightarrow \quad\quad 4y = 3x + 2 \Rightarrow y = \frac{3x + 2}{4}$$

61. (a) $\dfrac{5 \times 10^3}{\frac{1}{5} \times 10^2} \times 100\% = 25000\%$

62. (c) $\quad\quad \pi r^2 = 25\pi \quad\quad$ (given)
$$\Rightarrow \quad\quad r^2 = 25$$
$\therefore$ Equation of circle with centre (0, 0) and radius 5 is
$$x^2 + y^2 = 25$$
which is not passing through (5, 5).

63. (a) Total number of seats $= r \times d = dr$
Out of which 3 are vacant, so number of pupils in class $= dr - 3$

64. (a) Let l and b be the original length and width of the rectangle. After 50% increases new length is
$$l' = l + l \times \frac{50}{100} = \frac{3l}{2}$$
If area remains same, then new width b' will be such that $A = l'b' = lb$
$$\Rightarrow \quad\quad \frac{3l}{2}b' = lb \Rightarrow b' = \frac{2}{3}.b$$
Hence, percentage decrease in width
$$= \frac{b - b'}{b} \times 100 = \frac{\frac{b}{3}}{b} \times 100$$
$$= 33.33\%$$

65. (c) Number of revolutions $= \dfrac{\text{distance}}{\text{perimeter}}$
$$\frac{1000}{2\pi(0.5)} = \frac{1000}{\pi}$$

66. (d) Required average
$$\Rightarrow \quad\quad \frac{5 + 10 + 15 + x}{4} = 20$$
$$\Rightarrow \quad\quad\quad\quad x = 50$$

67. (d) $255 = 5 \times 51$
$$= 3 \times 5 \times 17$$
Hence, the largest prime factor is 17

68. (a) American in the committee are
$$1 - \frac{3}{5} = \frac{2}{5} \text{ part}$$
American men are
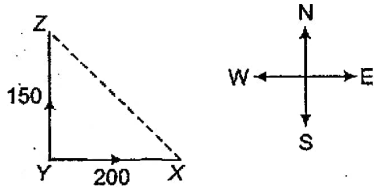$$\frac{2}{3} \times \frac{3}{8} = \frac{1}{4} \text{ part}$$
So, American women are
$$\frac{2}{5} - \frac{1}{4} \text{ part} = \frac{3}{20} \text{ part}$$

69. (d) As, $A = 2 + 4 + \dots + 998 \Rightarrow A = \dfrac{499}{2}[2 + 998] = 249500$
So, if $S = 1 + 3 + 5 + \dots + 999$
$$\Rightarrow \quad S = \frac{500}{2}(1 + 999) = 250000$$
Then, $\quad\quad S = A + 500$

70. (a) The given sequence is having 3, 1's followed by 2, 2's followed by 1, 3's, so it has a cycle of length 6.
So, $141 = 6 \times 23 + 3$
So, 141st number is 1.
143rd number is 2 and 145th number is 1.
So, their sum is $1 + 2 + 1 = 4$

71. (d) $2^{14} \times 8^2 \times 10^3$
$= (4 \times 16^3) \times (4 \times 16^1) \times (10^3) \times 16^0$
$= (4 \times 10^3) (4 \times 10^1) (10^3 \times 10^0)$
$= 4000 \times 40 \times 1000$
$= 16 \times 10000000 = 100000000$ in hexadecimal.
$= (10)^8$ in hexadecimal
$= (16)^8 = 2^{32}$ in decimal system $= (16)^8$ in decimal system

72. (b) $AB + A \wedge B + \wedge AB + \wedge A \wedge B$
$= AB + AB' + A'B + A'B'$
$= A(B + B') + A'(B + B')$ $(\because \wedge A = A', A + A' = 1)$
$= A + A' = 1$

73. (c) The value of I at the start of the loop is 3. Initial value of J is 2 and step length for increment is 4, the loop will work till the value of I is more than 11.
$I = I + J$
$\Rightarrow$ Step I $I = 3 + 2 = 5$
                $J = 2 + 4 = 6$
       Step II $I = 5 + 6 = 11$
                $J = 6 + 4 = 10$
       Step III $I = 11 + 10 = 21$
Now, loop will stop as $21 > 11$
Hence, $I = 21$

74. (b) For $J = 1$ to 5, we get 3 odd numbers and 2 even numbers. So, value of k is increased by 1, 3 times and decreased by 1, 2 times. Hence, k is increased by 1
This changes in value of J is made 10 times for $I = 1$ to 10, so $K = 10 \times 1 = 10$

75. (c) Given values, $a = 2, b = 1$ and $c = 3$
'c' compiler follow right-to-left formation
So, 1. $c = a + b$, here, $a = 2, b = 1 \Rightarrow c = 2 + 1 = 3$
2. $b = a + c$, here, $a = 2, c = 3$
$\Rightarrow$ $b = 2 + 3 = 5$
3. $a = b + c$, here, $b = 5, c = 3$
$\Rightarrow$ $a = 5 + 3 = 8 \Rightarrow$ $a = 8, b = 5, c = 3$

76. (d) Beans It is a reusable software component that can be visually manipulated in builder tools. While ADA, LISP and PL / I are programming languages.

77. (b) If comparision is done one-by-one, then in each comparsion the largest number is taken, then after $N - 1$ comparsions the largest of all the numbers will be obtained.

78. (a) For $I = 1, J = 0 + 1 = 1$
$I = 2, J = 1 * 1 = 1$
$I = 3, J = 0$
$I = 4, J = 0 + 1 = 1$
$I = 5, J = 1 * 1 = 1$
$I = 6, J = 0$
$I = 7, J = 0 + 1 = 1$
$I = 8, J = 1 * 1 = 1$
$I = 9, J = 0$
$I = 10, J = 0 + 1 = 1$

79. (c) Stack is known as last in first out. (LIFO).

80. (d) $10 \times 256 + 12 \times 16 + 9$
$= 10 \times 16^2 + 12 \times 16^1 + 9 \times 16^0$ (in hexadecimal form)
                in binary system.
$\underline{1010}$, $\underline{1100}$, $\underline{1001}$,
 10   12   9

81. (b) Initial area, $A = l w$
New area, $A' = (l + 3) w = lw + 3w$
Increment in area $= A' - A = 3w$

82. (c)

From the above figure, the shortest distance between X and Z is
$\sqrt{(150)^2 + (200)^2} = \sqrt{62500} = 250$

83. (a) By the figure, we see that A spend 10% while B spend 5% of his budget on health.
So, A spend 200% more than B.

84. (b) C spend 30% on entertainment while 20% on housing, so total is $30\% + 20\% = 50\%$

85. (b) Family A spend 40% while family C spend 20% on food bill.
So, amount spent on food bill by A is $20000 \times \dfrac{40}{100} = 8000$
and C it is $100000 \times \dfrac{20}{100} = 20000$
So, family C spends $2\dfrac{1}{2}$ times as much family A spends.

86. (a) By the given graph, the curve representing Bombay has value 50 corresponding to year 1989 (1980 + 9)

87. (c) By comparing graph of Pune and India, largest gap is in the year 2000.

88. (d) The sharpest rise according to the slope of the graph was in the period 1995-97.

89. (d) In 1992, both the graphs that of Pune and India is coinciding, hence, they have same ratios of patients.

90. (c) In 2000 Pune have 50 patients per 100000, so
per 1000 it has $\dfrac{50}{100} = 0.5$ patients.

Solutions (Q. Nos 91-96)

91. (a) In the whole passage author describes the properties and uses of water.

92. (c)

93. (d) All these qualities have been mentioned in the paragraph.

94. (b) There is no discussion of modification of weather in the passage.

95. (b) The author's tone in the passage is dispassionate. Only properties of water have been discussed straight forward.

96. (a) The author organises the passage by comparison and contrast between water and other liquids.

Solutions (Q. Nos. 97-100)

97. (d) In this passage fungus is depicted as parasitic which lives on others for its survival.

98. (d) Option (a, b, c) have been mentioned in the passage as properties of fungi, but option (d) has not been mentioned.

99. (a) This statement is figurative as we often see bread having fungus and fungus on varieties of things around us.

100. (d) The author is primarily concerned with describing the actions of fungi.