12 Practice Set

ARITHMETIC

1. 125% of 560 + 22% of 450 = ?
(a) 799 (b) 700
(c) 782 (d) 749

2. $4900 \div 28 \times 444 \div 12 = ?$
(a) 6575 (b) 6475
(c) 6455 (d) 6745

3. What is the compound interest accrued on an amount of Rs 8500 in two years @ interest 10% per annum?
(a) ₹1875 (b) ₹1885
(c) ₹1775 (d) ₹1785

4. A train running at the speed of 60 kmph crosses a 200 m long platform in 27 s. What is the length of the train ?
(a) 250m (b) 200m
(c) 240m (d) 450m

5. 10 men can complete a piece of work in 8 days. In how many days can 16 men complete that work?
(a) 4 days (b) 5 days
(c) 6 days (d) 3 days

6. If the numerator of a certain fractions increased by 100% and the denominator is increased by 200%; the new fraction thus formed is $\frac{4}{21}$. What is the original fraction?
(a) $\frac{2}{7}$ (b) $\frac{3}{7}$ (c) $\frac{2}{5}$ (d) $\frac{4}{7}$

7. The ratio of the ages of A and B seven years ago was 3 : 4 respectively. The ratio of their ages nine years from now will be 7 : 8 respectively. What is B's age at present?
(a) 16 years (b) 19 years
(c) 28 years (d) 23 years

8. The perimeter of a square is thrice the perimeter of a rectange. If the perimeter of the square is 84 cm and the length of the rectangel is 8 cm, what is the difference between the breadth of the rectangle and the sidce of the square?
(a) 15 cm (b) 19 cm
(c) 10 cm (d) 8 cm

9. The area of a circle is equal to the area of a rectangel with perimeter equal to 42 m and breadth equal to 8.5 m. What is the area of the circle?
(a) 116.25 sq m (b) 104.25 sq m
(c) 146.25 sq m (d) 106.25 sq m

10. The product of 5% of a positive number and 3% of the same number is 504.6 What is half of that number?
(a) 290 (b) 340
(c) 680 (d) 580

11. 4 women and 12 children together take four days to complete a piece of work. How many days will four children alone take to complete the piece of work if two women alone can complete the piece of work in 16 days?
(a) 32 (b) 24
(c) 16 (d) 12

12. Anu walks 2.31 km in three weeks by walking an equal distance each day. How many metres does she walk each day?
(a) 110m (b) 90m
(c) 140m (d) 120m

13. A man riding a bicycle completes one lap of a square field along its perimeter at the speed of 43.2 km/hr in 1 minute 20 seconds. What is the area of the field?
(a) 52900 sq m (b) 57600 sq m
(c) 48400 sq m (d) Can't be determined

14. On Teacher's Day, 4800 sweets were to be equally distributed among a certain number of children. But on that particular day 100 children were absent. Hence, each child got four sweets extra. How many children were originally supposed to be there?
(a) 300 (b) 400
(c) 540 (d) 500

15. The ratio of the monthly oncomes of Sneha, Tina and Akruti is 95:110:116. If Sneha's annual income is ₹3,42,000, what is Akruit's annual income?
(a) ₹3,96,900 (b) ₹5,63,500
(c) ₹4,17,600 (d) ₹3,88,000

16. A truck covers a distance of 256 km at the speed of 32 km/hr. What is the average speed of a car which travels a distance of 160 km more than the truck in the same time?
(a) $46\ kmh^{-1}$ (b) $52\ kmh^{-1}$
(c) $49\ kmh^{-1}$ (d) $64\ kmh^{-1}$

17. In an examination, the maximum aggregate marks is 1020. In order to pass the exam a student is required to obtain 663 marks out of the aggregate marks. Shreya obtained 612 marks. By what per cent did Shreya fail the exam?
(a) 5% (b) 8%
(c) 7%
(d) Can't be determined

DIRECTIONS (Qs. 18-19) : *What should come in place of question mark (?) in the following number series?*

18. 7 8 4 13 –3 22 ?
(a) –7 (b) –10
(c) –12 (d) –14

19. 250000 62500 12500 3125 625 ? 31.25
(a) 156.25 (b) 172.25
(c) 125 (d) 150

20. The average age of a lady and her daughter is 28.5. The ratio of their ages is 14 : 5 respectively. What is the daughters age?
(a) 12 years (b) 15 years
(c) 18 years (d) Cannot be determined

21. The cost of the paint is ₹ 36.50 per kg. If 1 kg of paint covers 16 square feet, how much will it cost to paint outside of a cube having 8 feet each side?
(a) ₹ 692 (b) ₹ 768
(c) ₹ 876 (d) ₹ 972

22. If the polynomial f (x) is such that f (– 43) = 0, then a factor of f (x) is :
(a) x – 43 (b) x
(c) x – 7 (d) x + 43

23. If $(x + 1)$ is a factor of $2x^3 - ax^2 - (2a - 3)x + 2$, then the value of 'a' is
(a) 3 (b) 2 (c) $\frac{3}{2}$ (d) $\frac{1}{2}$

24. If $a = \sqrt{2} + 1$, $b = \sqrt{2} - 1$, then the value of $\frac{1}{a+1} + \frac{1}{b+1}$ is
(a) 9 (b) 3
(c) 1 (d) 2

25. If $x - \frac{1}{x} = 5$, then find the value of $x^4 + \frac{1}{x^4}$.
(a) 727 (b) 772
(c) 722 (d) 277

26. The length of the perpendicular from (3, –1) to the line $12x + 5y + 8 = 0$ is
(a) $\frac{29}{25}$ unit (b) 5 unit
(c) 3 unit (d) $\frac{37}{13}$ unit

27. The sum to 200 terms of the series 1 + 4 + 6 + 5 + 11 + 6 + ... is
(a) 30,400 (b) 29,800
(c) 30,200 (d) None of these

28. If an equilateral triangle PQR is inscribed in a circle with centre O, then ∠QOR is equal to
(a) 60° (b) 30°
(c) 120° (d) 90°

29. Two equal circles pass through each other's centre. If the radius of each circle is 5 cm, what is the length of the common chord?
(a) $5\sqrt{3}$ (b) $10\sqrt{3}$
(c) $\frac{5\sqrt{3}}{2}$ (d) 5

30. The product of two number is 2160 and their HCF is 12. Find the possible pairs of numbers.
(a) 1 (b) 2 (c) 3 (d) 4

31. A man sitting in a train which is travelling at 50 kmph observes that a goods train, travelling in opposite direction, takes 9 seconds to pass him. If the goods train is 280 m long, find its speed.
(a) 62 kmph (b) 58 kmph
(c) 52 kmph (d) None of these

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

33. If $x + \left(\frac{1}{x}\right) = 2\cos\alpha$, then what is the value of $x^2 + \left(\frac{1}{x^2}\right)$?
(a) $4\cos^2\alpha$ (b) $4\cos^2\alpha - 1$
(c) $2\cos^2\alpha - \sin^2\alpha$ (d) $\cos^2\alpha - \sin^2\alpha$

34. The value of $\frac{\sqrt{1+\sin x}+\sqrt{1-\sin x}}{\sqrt{1+\sin x}-\sqrt{1-\sin x}}$ is equal to
(a) cosec x + cot x
(b) cosec x + tan x
(c) sec x + tan x
(d) cosec x – cot x

35. If (1 + tan A) (1 + tan B) = 2, then (A + B) is equal to
(a) $\frac{\pi}{2}$ (b) $\frac{\pi}{3}$
(c) $\frac{\pi}{4}$ (d) $\frac{\pi}{6}$

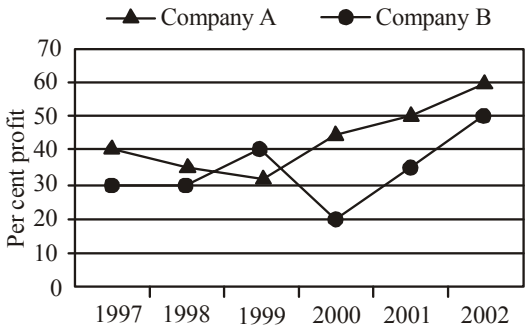
36. What is the value of $\sin^3 60° \cot 30° - 2\sec^2 45° + 3\cos 60° \tan 45° - \tan^2 60°$?
(a) $\frac{35}{8}$ (b) $-\frac{35}{8}$
(c) $-\frac{11}{8}$ (d) $\frac{11}{8}$

37. The angle of elevation of the sun when the length of the shadow of a pole is $\sqrt{3}$ times of its height of the pole is :
(a) 30° (b) 45°
(c) 60° (d) 75°

DIRECTIONS (Qs.38-40): *Study the following graph to answer the given questions.*

Percent profit earned by two companies over the given years.

$$\%\text{profit} = \frac{\text{Income} - \text{Expenditure}}{\text{Expenditure}} \times 100$$



38. If the expenditure of Company B in 2000 was ₹ 200 crores, what was its income?
(a) ₹ 240 crores
(b) ₹ 220 crores
(c) ₹ 160 crores
(d) Cannot be determined

39. If the income of Company A in 2002 was ₹ 600 crores, what was its expenditure?
(a) ₹ 360 crores
(b) ₹ 480 crores
(c) ₹ 375 crores
(d) Cannot be determined

40. If the income of Company B in 1998 was ₹ 200 crores, what was its profit in 1999?
(a) ₹ 21.5 crores (b) ₹ 153 crores
(c) ₹ 46.15 crores
(d) Cannot be determined

GENERAL INTELLIGENCE & REASONING

DIRECTIONS (Qs.41-42): *In select the related word/ letters/number from the given alternatives :*

41. Safe : Secure : : Protect : ?
(a) Conserve (b) Sure
(c) Guard (d) Lock

42. Aeroplane : Cockpit : : Train : ?
(a) Wagon (b) Coach
(c) Compartment (d) Engine

DIRECTIONS (Qs. 43-44): *In each of the following questions, four words have been given, out of which three are alike in some manner and the fourth one is different. Choose out the odd one.*

43. (a) Necklace (b) Ornament
(c) Bangle (d) Ring

44. (a) Correction (b) Improvement
(c) Betterment (d) Elevation

45. Which one set of letters when sequentially placed at the gaps in the given letter series shall complete it?
xy _ kx _ zk _ yzk xyz _ _
(a) zyxkx (b) zykxz
(c) zkxyk (d) zxykx

46. In the following question, number of letters are skipped in between by a particular rule. Which of the following series observes the rule?
(a) BAFHTU (b) ACEGJL
(c) ACFJOU (d) ADFHJL

47. Find the missing number (?).

3	4	5
2	3	4
1	2	3
14	29	?

(a) 50 (b) 30 (c) 40 (d) 32

DIRECTIONS (Qs. 48) : *In the following question from among the given alternatives select the one in which the set of numbers is most like the set of numbers given in the questions.*

48. Given Set: (4, 25, 81)
(a) (4, 36, 79) (b) (9, 48, 81)
(c) (16, 64, 100) (d) (9, 49, 143)

DIRECTIONS (Qs. 49) : *In each of the following questions, four words have been given, out of which three are alike in some manner and the fourth one is different. Choose out the odd one.*

49. G 4 T, J 10 R, M 20 P, P 43 N, S 90 L
(a) S 90 L (b) J 10 R
(c) M 20 P (d) P 43 N

DIRECTION (Qs. 50) : *In each of the following questions various terms of a series are given with one term missing as shown by (?). Choose the missing term.*

50. P 3 C, R 5 F, T 8 I, V 12 L, ?
(a) Y 17 O (b) X 17 M
(c) X 17 O (d) X 16 O

51. EXCURTION is coded as CXEURTNOI, SCIENTIST will be coded in the same manner as :
(a) TSIICSNTE (b) ICSNTETSI
(c) ICSTNETSI (d) ICSNTEIST

52. If in a certain code, RAMAYANA is written as PYKYWYLY, then how MAHABHARATA can be written in that code?
(a) NBIBCIBSBUB
(b) LZGZAGZQZSZ
(c) MCJCDJCTCVC
(d) KYFYZFYPYRY

53. In a joint family there are father, mother, 3 married sons and one unmarried daughter. Of the sons, 2 have 2 daughters each, and one has a son. How many female members are there in the family?
(a) 2 (b) 3
(c) 6 (d) 9

54. (I) F is the brother of A,
(II) C is the daughter of A,
(III) K is the sister of F,
(IV) G is the brother of C.
Who is the uncle of G?
(a) A (b) C
(c) K (d) F

55. Mamatha walks 14 metres towards west, then turns to her right and walks 14 metres and then turns to her left and walks 10 metres. Again turning to her left she walks 14 metres. What is the shortest distance (in metres) between her starting point and her present position?
(a) 38 m (b) 28 m
(c) 24 m (d) 10 m

56. A man starts from a point, walks 2 km towards north, turns towards his right and walks 2 km, turns right again and walks. What is the direction now he is facing?
(a) South (b) East
(c) North (d) West

57. Of the five members of a panel sitting in a row. A is to the left of B, but on the right of C, D is on the right of B but is on the left of E. Find the member who is sitting in the middle.
(a) B (b) D
(c) A (d) A

58. A, B, C, D and E are sitting on a bench. A is sitting next to B. C is sitting next to D. D is not sitting with E who is on the left end of the bench. C is on the second position from the right. A is on the right of B and E. A and C are sitting together. In which position is A sitting?
(a) Between B and D (b) Between B and C
(c) Between E and D (d) Between C and E

59. From the given alternative wrods, select the word which **cannot** be formed using the letters of the given word:
'COMPREHENSION'
(a) COMPRISE (b) PENSION
(c) ONION (d) PREACH

60. From the given alternative words, select the word which **cannot** be formed using the letters of the given word:
MISFORTUNE
(a) FORT (b) TURN
(c) SOFT (d) ROAM

61. Which one of the given responses would be a meaningful order of the following?
1. Ocean 2. Rivulet
3. Sea 4. Glacier
5. River
(a) 5, 2, 3, 1, 4 (b) 4, 2, 5, 3, 1
(c) 5, 2, 3, 4, 1 (d) 4, 2, 1, 3, 5

62. Arrange the following words as per order in the dictionary.
1. Preposition 2. Preparatively
3. Preposterous 4. Preponderate
5. Prepossess
(a) 2, 4, 1, 5, 3 (b) 1, 5, 2, 4, 3
(c) 5, 4, 2, 3, 1 (d) 4, 2, 5, 1, 3

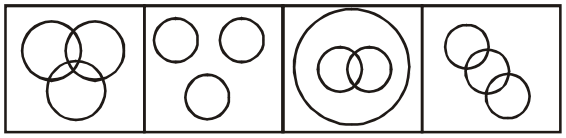
63. A national leader was born on 29th February in a particular year. He will have his birthday once in
(a) 2 years (b) 3 years
(c) 4 years (d) None of these

64. If two days before yesterday is Monday, what will be the day of the week 3 days after day after tommorow?
(a) Thursday (b) Friday
(c) Wednesday (d) Saturday

65. If the day after tomorrow is Sunday, what day was tomorrow's day before yesterday?
(a) Friday (b) Thursday
(c) Monday (d) Tuesday

66. Raju and Nirmala celebrated their first wedding anniversary on Sunday, the 5th of December 1993. What would be the day of their wedding anniversary in 1997?
(a) Wednesday (b) Thursday
(c) Friday (d) Tuesday

67. Which diagram correctly represents the relationship between politicians, poets and women?



(a) (b) (c) (d)

68. There are 80 families in a small extension area. 20 percent of these families own a car each. 50 per cent of the remaining families own a motor cycle each. How many families in that extension do not own any vehicle?
(a) 30 (b) 32
(c) 23 (d) 36

DIRECTIONS (Qs. 69-70): *In each of the following question, one, two or more statements are given followed by conclusion I, II or more. You have to consider the statements to be true, even if they seem to be at variance from commonly known facts. You are to decide which of the given conclusions definitely follows from the given statements.*

69. **Statements:**
1. All children are students.
2. All students are players.

Conclusions:
I. All cricketer are students
II. All children are players.
(a) Only conclusion I follows.
(b) Only conclusion II follows.
(c) Both conclusions I or II follows.
(d) Neither conclusion I nor conclusion II follows.

70. **Statements:**
1. No teacher comes to the school on a bicycle.
2. Anand comes to the school on a bicycle.

Conclusions:
I. Anand is not a teacher.
II. Anand is a student.
(a) Conclusion I alone can be drawn.
(b) Conclusion II alone can be drawn.
(c) Both Conclusions can be drawn.
(d) Both Conclusions can not be drawn.

71. Select correct combination (sequence) of mathematical signs to replace * signs to balance the equation: 9 * 4 * 22 * 14
(a) $\times = -$ (b) $\times - =$
(c) $= - \times$ (d) $- \times =$

72. If '–' stands for division '+' stands for subtraction, '÷' stands for multiplication, '×' stands for addition, then which one of the following equations is correct?
(a) $70 - 2 + 4 \div 5 \times 6 = 44$
(b) $70 - 2 + 4 \div 5 \times 6 = 21$
(c) $70 - 2 + 4 \div 5 \times 6 = 341$
(d) $70 - 2 + 4 \div 5 \times 6 = 36$

73. B is twice as old as A but twice younger than F. C is half the age of A but is twice older than D. Who is the second oldest?
(a) B (b) F
(c) D (d) C

74. A two member committee comprising of one male and one female member is to be constituted out of five males and three females. Amongst the females, Ms. A refuses to be a member of the committee in which Mr. B is taken as the member. In how many different ways can the committee be constituted?
(a) 11 (b) 12
(c) 13 (d) 14

DIRECTIONS (Qs. 75) : *This section contains multiple choice questions. Each question has 4 choices (a), (b), (c) and (d) out of which ONLY ONE is correct.*

75. 'F' can be represented by 14, 21, etc., and "E" can be represented by 20, 32, etc. Identify the set for the word FIRE.

MATRIX - I

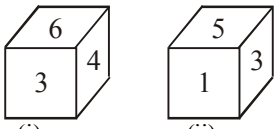
	0	1	2	3	4
0	D	E	F	I	N
1	I	N	D	E	F
2	E	F	I	N	D
3	N	D	E	F	I
4	F	I	N	D	E

MATRIX - II

	5	6	7	8	9
5	O	P	R	S	T
6	S	T	O	P	R
7	P	R	S	T	O
8	T	O	P	R	S
9	R	S	T	O	P

(a) 21, 22, 88, 33 (b) 14, 10, 69, 14
(c) 33, 34, 76, 22 (d) 02, 03, 57, 01

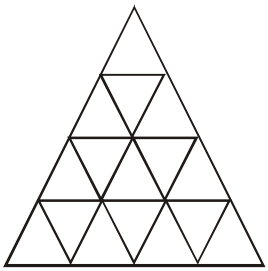
76. On the basis of two positions of dice, find what number will be on the opposite face of number 5 ?



(i) (ii)

(a) 1 (b) 3
(c) 4 (d) 5

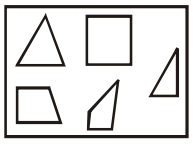
77. How many triangles are there in the following figure?



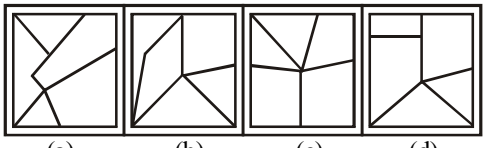
(a) 29 (b) 27
(c) 23 (d) 30

78 Among the four answer figures, which figure can be formed from the cut-pieces given below in the question figure?

Question Figure:



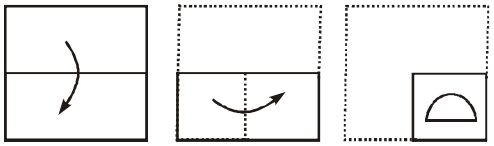
Answer Figure:



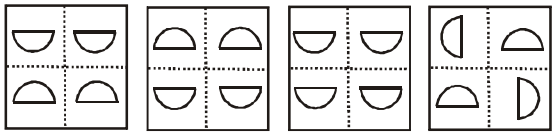
(a) (b) (c) (d)

DIRECTION (Q.79) : *In each of the following questions a set of three figures 1, 2 and 3 showing a sequence of folding of a piece of paper. Fig. (3) shows the manner in which the folded paper has been cut. These three figures are followed by four answer figures from which you have to choose a figure which would most closely resemble the unfolded form of fig. (3).*

79.

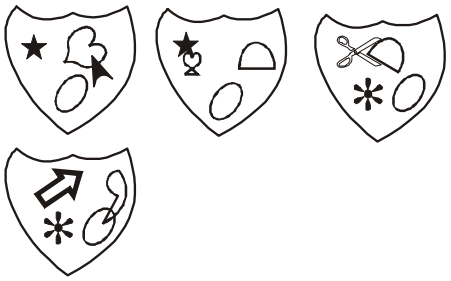


(1) (2) (3)



(a) (b) (c) (d)

80.



What comes next in the above sequence ?

(a)

(b)

(c)

(d)

GENERAL AWARENESS

81. Several computers linked to a server to share programs and storage space .....
(a) Network (b) grouping
(c) library (d) integrated system

82. A prescribed set of well-defined instructions for solving mathematical problems is called .....
(a) a compiler (b) a code
(c) a description (d) an algorithm

83. The process of preparing a floppy diskette for use is called .....
(a) assembling (b) translating
(c) parsing (d) formatting

84. LAN stands for .....
(a) Local Access Network
(b) Local Area Network
(c) Logical access network
(d) Logical Area Network

85. A Field is a related group of .....
(a) Records (b) Files
(c) Characters (d) Cables

86. Which one of the following is not a line of demarcation between two countries?
(a) International Date Line
(b) MacMahon Line
(c) Radcliffe Line
(d) Durand Line

87. Which of the following dances belongs originally to Kerala ?
(a) Odissi (b) Kathak
(c) Kuchipudi (d) Kathkali

88. Nathu-La is located in Himalayas. What does 'La' mean ?
(a) Glacier (b) Pass
(c) Hillock (d) Crevasse

89. Selectivity of a receiver can be increased by -
(a) Using more tuned circuit
(b) Decreasing number of tuned circuits
(c) Using loud speaker
(d) Increasing gain of the receiver

90. What will happen if a transformer is connected to D.C. voltage?
(a) It will induce more voltage
(b) Its reactance will increase
(c) The primary will burn out and no emf will be induced in the secondary
(d) None of these

91. The unit of noise pollution (level) is -
(a) decibel (b) decimal
(c) ppm (d) None of these

92. Transition ions absorb light in -
(a) visible region (b) infrared region
(c) ultraviolet region (d) microwave region

93. According to kinetic theory gases, at the temperature absolute zero, the gas molecules -
(a) Start movement
(b) Become massless
(c) Start emitting light
(d) Stop movement

94. Tides are primarily a result of the -
(a) Attraction of the moon
(b) Farrel's Law
(c) Ocean currents
(d) Pressure system of the earth

95. Electric fuse wire is made of alloys because alloys -
(a) Have low melting point
(b) Have high melting point
(c) Are economical
(d) Do not get heated easily

96. Which two colours can be mixed to make green?
(a) Yellow and Balck (b) Yellow and Blue
(c) Orange and Violet (d) Purple and Yellow

97. The freezing point of fresh water is -
(a) 0°C (b) 4°C
(c) 3°C (d) 5°C

98. Flywheel is an important part of a steam engine because it -
(a) gives strength to the engine
(b) accelerates the speed of the engine
(c) helps the engine in keeping the speed uniform
(d) decreases the moment of inertia

99. To provide opportunities for education to the child or as the case may be, ward between the age of six and fourteen years is a :
(a) Fundamental Right under Indian Constitution
(b) Fundamental Duty under Indian Constitution
(c) Directive Principles of State Policy Under Indian Constitution
(d) Legal Right under Indian Constitution

100. Find the incorrect statement with respect to duration of houses of Parliament:
(a) The council of states shall not be subject to dissolution
(b) As nearly as possible 1/3 of members of council of states shall retire as soon as may be on the expiration of every second year
(c) While the proclamation of emergency is operation for maximum period allowed under the constitution of India and has ceased to operate, the period of House of the people may be extended for a period of one year and not beyond
(d) The House of the people, unless sooner dissolved, shall continue for five years from the date appointed for its first meeting

101. Who shall be the ex-officio Chairman of Council of States?
(a) The President of India
(b) The Vice President of India
(c) The Council of states shall choose a member the council to act as chairman
(d) The Speaker of the House of People

102. Which of the following systems in independent India goes against the very basis of democracy?
(a) Caste system
(b) Economic system
(c) Party system
(d) Parliamentary system

103. The blank space between stamps in a sheet is known as
(a) Traffic Light (b) Vignette
(c) Margin (d) Gutter

104. Who was the author of "Athihyamala" ?
(a) Sanjayan
(b) Kottarathil Sankunni
(c) Poonthanam
(d) None of these

105. Supreme Court Judge is appointed by the __?
(a) Prime Minister (b) President
(c) Parliament (d) Chief Justice

106. United Nations Day is observed on
(a) October 21 (b) October 22
(c) October 23 (d) October 24

107. World Post Day is observed on
(a) November 9 (b) November 14
(c) October 9 (d) October 24

108. "A thing of beauty is a joy for ever" is a line written by?
(a) John Keats
(b) Percy Bysshe Shelley
(c) Alexander Pope
(d) Alfred Tennyson

109. Study of Fossils is known as?
(a) Paleantology (b) Petrology
(c) Seismology (d) None of the above

110. A citizen can directly move the Supreme Court for any violation of Fundamental Rights under
(a) Article 31 (b) Article 32
(c) Article 33 (d) Article 34

111. Which one of the following sitting Vice-Presidents of India contested for the post of President and lost the election?
(a) S. Radhakrishnan
(b) V.V. Giri
(c) Bhairon Singh Shekhawat
(d) Both (B) and (C)

112. The French challenge to British in India came to an end with
(a) Battle of Wandiwash
(b) Battle of Srirangapattinam
(c) Battle of Plassey
(d) Battle of Buxar

113. Which country has the highest railway line in the world?
(a) Tanggula (b) Australia
(c) India (d) Japan

114. The world's longest railway platform is in India. In which state is it?
(a) Madhya Pradesh
(b) Uttar Pradesh
(c) West Bengal
(d) Punjab

115. Which is the only country to have a fully electrified railway network?
(a) Japan (b) China
(c) India (d) Switzerland

116. Name the scheme launched to provide free electricity connection to each household in the Bihar in the next two years.
(a) Har Ghar Bijli Lagataar
(b) Har Ghar Ujala Yojna
(c) Ghar Ghar Roshini ka Vada
(d) Deen Dayal Upadhyaya Gram Jyoti Yojana

117. What is the revamped Toll-free helpline number launched by UIDAI to help residents get quick access to information about Aadhaar.
(a) 1007 (b) 1991
(c) 1866 (d) 1947

118. Which country will host T20 Cricket World Cup for the Blind in 2017?
(a) Australia (b) India
(c) Pakistan (d) New Zealand

119. The government will reintroduce compulsory class X board examination for ____ schools from 2017.
(a) ICSE (b) CBSE
(c) CISCE (d) State Board(SB)

120. Recently which state has become the first state to adopt 'Fly Ash Utilisation Policy'?
(a) Karanataka (b) Maharasthra
(c) Madhya Pradesh (d) Chhatisgarh

Hints & Explanations

1. (a) $? = 125\%\text{ of }560 + 22\%\text{ of }450$

$\Rightarrow \quad ? = \frac{125}{100} \times 560 + \frac{22}{100} \times 450$

$\Rightarrow \quad ? = \frac{70000}{100} + \frac{9900}{100}$

$\Rightarrow \quad ? = 700 + 99 = 799$

2. (b) $? = 4900 \div 28 \times 444 \div 12$

$\Rightarrow \quad ? = 175 \times 37$

$\Rightarrow \quad ? = 6475$

3. (d) Compound Interest after two years

$= 8500\left(1 + \frac{10}{100}\right)^2 - 8500$

$= 8500 \times \frac{11}{10} \times \frac{11}{10} - 8500$

$= 10285 - 8500 = ₹\,1785$

4. (a) Let length of the train be x m
Speed of the train be 60 km/h

$= 60 \times \frac{5}{18} = \frac{50}{3}$ m/s

Then, $\frac{x + 200}{\frac{50}{3}} = 27$

$\Rightarrow \quad \frac{3(x + 200)}{50} = 27$

$\Rightarrow \quad 3x + 600 = 1350$

$\Rightarrow \quad 3x = 1350 - 600$

$\Rightarrow \quad 3x = 750$

$\Rightarrow \quad x = \frac{750}{3} = 250$ m

5. (b) Suppose 16 men can complete the same work in x days

Then, Men days

$10 \uparrow \quad 8 \downarrow$

$16 \quad\quad x$

$16 : 10 :: 8 : x$

$\Rightarrow \quad 16 \times x = 10 \times 8$

$\Rightarrow \quad x = \frac{10 \times 8}{16} = 5$ days

6. (a) Let the original fraction be $= \frac{x}{y}$.

$\therefore \quad \frac{x \times 200}{y \times 300} = \frac{4}{21} \Rightarrow \frac{x}{y} = \frac{4}{21} \times \frac{3}{2} = \frac{2}{7}$

7. (d) Let the present age of A = x and B = y years
According to first condition

$\frac{x-7}{y-7} = \frac{3}{4} \Rightarrow 4x - 28 = 3y - 21 \Rightarrow 4x - 3y = 7$ .... (i)

According to second condition

$\frac{x+9}{y+9} = \frac{7}{8} \Rightarrow 8x + 72 = 7y + 63$

$\Rightarrow 7y - 8x = 9$ ..... (ii)

$8x - 6y = 14$

$7y - 8x = 9$

$y = 23$ years.

8. (a) Perimeter of the square = 84 cm
Perimeter of the rectangle = 28 cm
Perimeter of the rectangle = 2(1 + b)
or, 2(8 + b) = 28 cm
or, b = 14 – 8 = 6 cm.
$\therefore$ Breadth of the rectangle = 6 cm

Side of the square $= \frac{84}{4} = 21$ cm

Difference = 21 – 6 = 15 cm.

9. (d) Perimeter of the rectangle = 42 m
$2(l + b) = 42$ m
or, $l + 8.5 = 21$m
or, $l = 12.5$ m.
Area of the rectangle = 12.5 × 8.5 = 106.25 sq.m.
$\therefore$ Area of the circle. = 106.25 sq.m.

10. (d) Let the positive number be x.

Then, $\frac{5x}{100} \times \frac{3x}{100} = 504.6$

$\therefore x \times \frac{5}{100} \times x \times \frac{3}{100} = 504.6$

or, $x^2 = \frac{504.6 \times 100 \times 100}{15}$

$\therefore x = 580.$

11. (b) Two women alone can complete a piece of work in 16 days.

$\therefore$ Four women can complete the same work in 8 days.

Since 12 children can complete the work in

$\frac{4 \times 8}{8-4} = \frac{4 \times 8}{4} = 8$ days.

$\therefore$ Four children can complete the work in

$\frac{12 \times 8}{4} = 24$ days.

12. (a) 2.31 km = 2.31 × 1000 = 2310 m

Total number of days = 3 × 7 = 21

$\therefore$ Distance covered by Anu each day = $\frac{2310}{21} = 110$ m.

13. (b) 43.2 m/hr = $43.2 \times \frac{5}{18} = 12$ m/s

Total distance covered = 12 × 80 = 960 m.

Perimeter of the square = 960 m.

Side of the square = 240 m.

Area = $(240)^2 = 57600$ sqm.

14. (b) Let the number of children be x.

Now, according to the question

$\left(\frac{4800}{x} - 100\right)(x+4) = 4800$

or, $\left(\frac{48}{x} - 1\right)(x+4) = 48$

or, $(48-x)(x+4) = 48x$

or, $x^2 + 4x - 192 = 0$

or, $(x+16)(x-12) = 0$

$\therefore x = 12$ sweets

Number of students = $\frac{4800}{12} = 400$.

15. (c) Sneha's monthly income

$= \frac{342000}{12} = 28500$

$\therefore$ Akruti's monthly income

$= \frac{28500}{95} \times 116 = 34800$

Akruti's annual income = 417600.

16. (b) Time taken by the truck = $\frac{256}{32} = 8$ hr.

Distance covered by the car = (256 + 160) = 416 km.

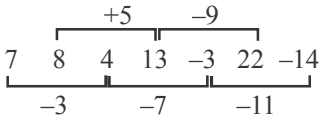
Time = 8 hr.

$\therefore$ Speed of the car = $\frac{416}{8} = 52$ km/hr.

17. (a) Required percentage

$= \frac{663 - 612}{1020} \times 100 = 5\%$.

18. (d)



19. (a) 250000 ÷ 4 = 62500

62500 ÷ 5 = 12500

12500 ÷ 4 = 3125

3125 ÷ 5 = 625

625 ÷ 4 = $\boxed{156.25}$

156.25 ÷ 5 = 31.25.

20. (b) Average age = 28.5

$\therefore$ Total age = 28.5 × 2 = 57

$\therefore$ Daughter's age = $\frac{5}{19} \times 57 = 15$ years

21. (c) Surface area of the cube = (6×8^2) sq. ft. = 384 sq. ft.

Quantity of paint required

$= \left(\frac{384}{16}\right)$kg = 24 kg.

$\therefore$ Cost of painting = ₹ (36.50 × 24) = ₹ 876.

22. (d) If f(– 43) = 0, then by factor theorem, we get (x + 43) is a factor of the polynomial f(x).

23. (a) Let $f(x) = 2x^3 - ax^2 - (2a-3)x + 2$

If (x + 1) is a factor of the above expression, then $f(-1) = 0$

We have,

$f(-1) = 2(-1)^3 - a(-1)^2 - (2a-3)\times(-1) + 2 = 0$

$\Rightarrow -2 - a + 2a - 3 + 2 = 0 \Rightarrow a - 3 \Rightarrow a = 3$

24. (c) $a = \sqrt{2} + 1 \Rightarrow a + 1 = \sqrt{2} + 2$

$$\Rightarrow \frac{1}{a+1} = \frac{1}{2+\sqrt{2}}$$

$$= \frac{2-\sqrt{2}}{(2+\sqrt{2})(2-\sqrt{2})} = \frac{2-\sqrt{2}}{4-2} = \frac{2-\sqrt{2}}{2}$$

$$b + 1 = \sqrt{2} \Rightarrow \frac{1}{b+1} = \frac{\sqrt{2}}{2}$$

$$\therefore \frac{1}{a+1} + \frac{1}{b+1} = \frac{2-\sqrt{2}}{2} + \frac{\sqrt{2}}{2} = \frac{2}{2} = 1$$

25. (a) $\because \left(x - \frac{1}{x}\right) = 5$

Squaring both sides,

$$\left(x - \frac{1}{x}\right)^2 = (5)^2$$

$$\Rightarrow x^2 + \frac{1}{x^2} - 2 \times x \times \frac{1}{x} = 25$$

$$\Rightarrow x^2 + \frac{1}{x^2} = 25 + 2 = 27$$

Squaring both sides again

$$\left(x^2 + \frac{1}{x^2}\right)^2 = (27)^2$$

$$\Rightarrow x^4 + \frac{1}{x^4} + 2 \times x^2 \times \frac{1}{x^2} = 729$$

$$\Rightarrow x^4 + \frac{1}{x^4} + 2 = 729 \Rightarrow x^4 + \frac{1}{x^4} = 729 - 2$$

$$\Rightarrow x^4 + \frac{1}{x^4} = 727$$

26. (c) Length of the perpendicular

$$= \frac{12\times 3 + 5(-1) + 8}{\sqrt{12^2 + 5^2}} = 3 \text{ unit}$$

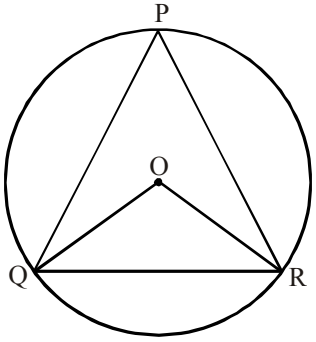
27. (c) Above series is a combination of two APs.
The 1st AP is $(1 + 6 + 11 + ...)$ and the 2nd AP is $(4 + 5 + 6 + ...)$
Since the terms of the two series alternate,
S = (1 + 6 + 11 + ...to 100 terms) + (4 + 5 + 6 + ...to 100 terms)

$$= \frac{100[2\times 1 + 99\times 5]}{2} + \frac{100[2\times 4 + 99\times 1]}{2}$$

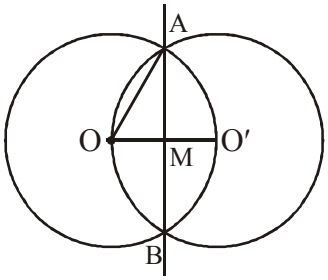
(Using the formula for the sum of an AP)
$= 50[497 + 107] = 50[604] = 30200$
Alternatively, we can treat two consecutive terms as one.
So we will have a total of 100 terms of the nature :
$(1+4) + (6+5) + (11+6)..... \Rightarrow 5, 11, 17, ...$
Now, a = 5, d = 6 and n = 100
Hence the sum of the given series is

$$S = \frac{100}{2} \times [2\times 5 + 99\times 6] = 50\,[604] = 30200$$

28. (c) As PQR is an equilateral triangle inscribed in a circle,
$\angle QPR = 60°$,
$\therefore \angle QOR = 2 \times \angle QPR = 2 \times 60° = 120°$



29. (a)



Given, distance between the centres of two circle = 5 cm
OO' = 5 cm

$$\therefore OM = \frac{5}{2} \text{ cm}$$

In ΔOAM,
$OA^2 = OM^2 + AM^2$

$$(5)^2 = \left(\frac{5}{2}\right)^2 + AM^2$$

$$AM = \sqrt{25 - \frac{25}{4}} = \frac{5\sqrt{3}}{2} \text{ cm}$$

$\therefore$ The length of common chord, $AB = 2 \times AM$

$$= 2 \times \frac{5\sqrt{3}}{2} = 5\sqrt{3} \text{ cm}$$

30. (b) HCF = 12. Then let the numbrs be 12x and 12y.
Now $12x \times 12y = 2160 \quad \therefore \quad xy = 15$
Possible values of x and y are (1, 15); (3, 5); (5, 3); (15, 1)
$\therefore$ the possible pairs of numbers (12, 180) and (36, 60)

31. (a) Relative speed

$$= \left(\frac{280}{9}\right) \text{m/sec} = \left(\frac{280}{9} \times \frac{18}{5}\right) \text{kmph}$$

$= 112$ kmph.
$\therefore$ Speed of goods train = (112 – 50) kmph = 62 kmph.

32. (b) $\sin^2\theta + \cos^4\theta = A$ or $1 - \cos^2\theta + \cos^4\theta = A$
$\Rightarrow \cos^4\theta - \cos^2\theta + (1 - A) = 0$
For real value of θ, $b^2 - 4ac \geq 0 \Rightarrow 1 - 4(1 - A) \geq 0$

$$\Rightarrow 4A - 3 \geq 0 \Rightarrow A \geq \frac{3}{4}$$

33. (b) $\cos^2 0° + \cos^2 3° + \cos^2 6° + \cos^2 9° + ...$
$...\cos^2 42° + \cos^2 45° + \cos^2 48° +$
$...+ \cos^2 81° + \cos^2 84° + \cos^2 87° +$
$\cos^2 90°$
$= 1 + (\cos^2 3° + \cos^2 87°) + (\cos^2 6° + \cos^2 84°)$
$+ (\cos^2 9° + \cos^2 81°) + ... + \cos^2 45°$

$$= 1 + (1) + ... + \frac{1}{2}$$

$$= 15 + \frac{1}{2} = 15.5$$

34. (a) $$\frac{\sqrt{1+\sin x} + \sqrt{1+\sin x}}{\sqrt{1+\sin x} - \sqrt{1-\sin x}} = \frac{(\sqrt{1+\sin x} + \sqrt{1-\sin x})^2}{(1+\sin x) - (1-\sin x)}$$

$$= \frac{2 + 2\sqrt{1 - \sin^2 x}}{2\sin x} = \frac{1 + \cos x}{\sin x}$$

$= \text{cosec } x + \cot x$

35. (c) $1 + \tan A + \tan B + \tan A \tan B = 2$
$\Rightarrow \tan A + \tan B + \tan A \tan B = 1$
$\Rightarrow \tan A + \tan B = 1 - \tan A \tan B$

$$\Rightarrow \frac{\tan A + \tan B}{1 - \tan A \tan B} = 1 = \tan 45°$$

$$\Rightarrow \tan(A + B) = \tan 45° \Rightarrow A + B = \frac{\pi}{4}$$

36. (b) $\sin^3 60° \cot 30° - 2 \sec^2 45°$

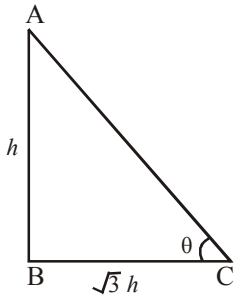
$+ 3 \cos 60° \tan 45° - \tan^2 60°$

$$= \left(\frac{\sqrt{3}}{2}\right)^3 . \sqrt{3} - 2.(\sqrt{3})^2 + 3.\frac{1}{2}.1 - (\sqrt{3})^2$$

$$= \frac{3\sqrt{3}}{8} \times \sqrt{3} - 2 \times 2 + \frac{3}{2} - 3 = \frac{9}{8} - 4 + \frac{3}{2} - 3$$

$$= \frac{9 - 32 + 12 - 24}{8} = \frac{21 - 56}{8} = -\frac{35}{8}$$

37. (a) Let AB be a pole of height h and BC be its shadow. Therefore, $BC = \sqrt{3}h$



Here, $\tan\theta = \frac{h}{\sqrt{3}h}$, or $\tan\theta = \frac{1}{\sqrt{3}}$

or $\theta = \tan^{-1}\frac{1}{\sqrt{3}} = 30°$

38. (a) Income of Company B in 2000

$$= 200 \times \frac{120}{100} = ₹ 240 \text{ crores}$$

39. (c) Expenditure of Company A in 2002

$$= 600 \times \frac{100}{160} = ₹ 375 \text{ crores}$$

40. (d) We can find out the amount of profit in 1998, we do not know the income and expenditure of A and B. therefore, option d is the correct choice.

41. (c) The words in each pair are synonyms of each other.

42. (d) As the pilot of an aeroplane sits in the cockpit, the driver of a train works in the engine.

43. (b) : All others are different types of ornaments.

44. (d) : All others are synonyms.

45. (a) XY [Z] K/X [Y] ZK /

[X] YZK / XYZ [K] / [X]

46. (c)

$B \xrightarrow{-1} A \xrightarrow{+5} F \xrightarrow{+2} H \xrightarrow{+12} T \xrightarrow{+1} U$

$A \xrightarrow{+2} C \xrightarrow{+2} E \xrightarrow{+2} G \xrightarrow{+3} J \xrightarrow{+2} L$

$A \xrightarrow{+2} C \xrightarrow{+3} F \xrightarrow{+4} J \xrightarrow{+5} O \xrightarrow{+6} U$

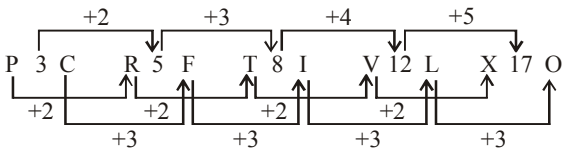
$A \xrightarrow{+3} D \xrightarrow{+2} F \xrightarrow{+2} H \xrightarrow{+2} J \xrightarrow{+2} L$

47. (a) $(3)^2 + (2)^2 + (1)^2$
$= 9 + 4 + 1 = 14$
$(4)^2 + (3)^2 + (2)^2$
$= 16 + 9 + 4 = 29$
Similarly,
$(5)^2 + (4)^2 + (3)^2 = 25 + 16 + 9 = 50$

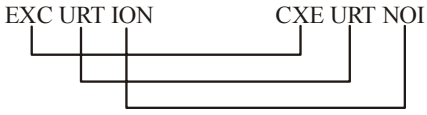
48. (c) The numbers given in the set are perfect Squares.
$4 = (2)^2; 25 = (5)^2.$
$81 = (9)^2$
Similarly
$16 = (4)^2; 64 = (8)^2$
$100 = (10)^2.$

49. (b) The letters of the alphabet on the first positions move + 3 steps forward while the numerical components in the middle move with the following pattern.
$\times 2 + 1, \times 2 + 2, \times 2 + 3, \times 2 + 4$ .....
Therefore, J10R does not fit in the series.

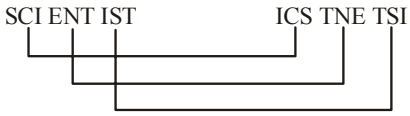
50. (c)



51. (c) The word is divided into three equal sections, and the letters of first and third sections are written backwards.



Similarly,

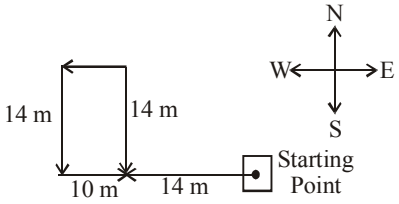


52. (d)

53. (d) Female members: Mother, 3 daughter-in-law, one daughter, Four grand daughters.
Thus, there are nine female members.

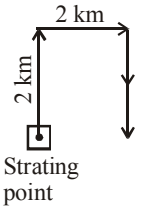
54. (d) G is the son of A and F is brother of A.

55. (c)



Required distance = 10 + 14 = 24 metres

56. (a)



It is clear from the diagram that he is facing towards south.

57. (a) [LEFT] C A [B] D E [RIGHT]

Middle

58. (b) Sitting arrangement

[E] [B] [A] [C] [D]

59. (d) There is no 'A' letter in the keyword.

60. (d) There is no 'A' letter in the keyword.

61. (b) Meaningful order of the given words :

4. Glacier
↓
2. Rivulet
↓
5. River
↓
3. Sea
↓
1. Ocean

62. (a) 2. Preparatively
↓
4. Preponderate
↓
1. Preposition
↓
5. Prespossess
↓
3. Preposterous

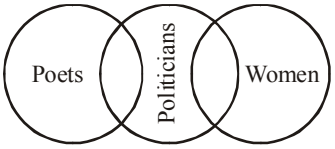
63. (c) 29th February comes in a Leap Year. Therefore, his birthday will come once in four years.

64. (a) Two days before yesterday was Monday.
Therefore, today is Monday + 4 = Friday
Tomorrow will be Saturday after Tomorrow will be Sunday.
Now, three days after Sunday will be Thursday.

65. (b) The day after tomorrow is Sunday.
Therefore, today is Friday.
The day on tomorrow's day before yesterday = Friday – 1 = Thursday

66. (c) Total number of days
= 27 + 365 + 365 + 365 + 339 = 1461 days
Now, 1461 ÷ 7 = 5 Odd days
Therefore, 5th December, 1997 would be Sunday + 5 = Friday

67. (d) Some politicians may be poets and vice-versa.
Some politicians may be women and vice-versa.
No poet can be women as women poet is called poetess.



68. (b) $20\%\text{ of }80 = \frac{20}{100}\times 80 = 16$

50% of remaining

$= (80-16)\times\frac{50}{100} = 32$

The families which do not own any vehicle.
$= 80-(32+16)$
$= 80-48 = 32$

69. (b) Both the Premises are Universal Affirmative (A-type).

All children are students.

All students are players.

A + A ⇒ A -type of Conclusion.
"All children are players."
This is Conclusion II.

70. (a) It is clear that Anand is not a teacher. Anand may be student or clerical staff.

71. (b) $9\times 4-22 = 14$
⇒ $36-22 = 14$

72. (b) $70\div 2-4\times 5+6 = 44$
⇒ $35-20+6 = 44$
⇒ $15+6\neq 44$
$70\div 2-4\times 5+6 = 21$
⇒ $35-20+6 = 21$
⇒ $41-20 = 21$

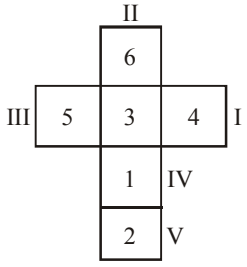
73. (a) B = 2A
F = 2B
A = 2C
C = 2D
F > B > A > C > D

74 (d) Total number of ways in which the committee can be formed
$= 5\times 3 = 15$
But Ms A refuses to be a member of the committee in which Mr. B is taken as a member.
Therefore, the required answer.
15 – 1 = 14

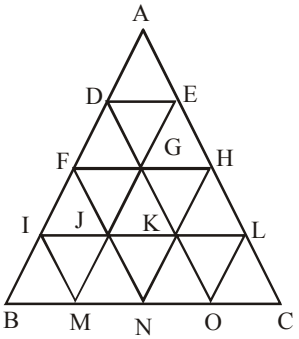
75. (d) F ⇒ 02, 14, 21, 33, 40
I ⇒ 03, 10, 22, 34, 41
R ⇒ 57, 69, 76, 88, 95
E ⇒ 01, 13, 20, 32, 44

Option	F	I	R	E
(a)	21	22	88	33
(b)	14	10	69	14
(c)	33	34	76	22
(d)	02	03	57	01

76. (c) Common number i.e. 3 to both the dice is placed on the central position of the figure. Now place the numbers in the anticlockwise direction in block I, II, III and IV respectively.Remaining number i.e. 2 will come in the block V. Hence number 4 is opposite to number 5.



77. (b)



The triangles are:
ΔABC; ΔADE; ΔAFH; ΔAIL;
ΔDFG; ΔDIK; ΔDBO; ΔGDE;
ΔEGH; ΔEJL; ΔEMC; ΔFIJ;
ΔFBN; ΔJFG; ΔGJK; ΔKGH;
ΔHKL; ΔHNC; ΔNFH; ΔGMO;
ΔIBM; ΔMIJ; ΔJMN; ΔNJK;
ΔKNO; ΔOKL; ΔLOC;

78. (c) 79. (a)

80. (d) When two figures touch , they disappear at the next stage and are replaced by two different figures.

81. (a) 82. (d) 83. (d) 84. (b) 85. (a)

86. (a) The International Date Line (IDL) is an imaginary line on the surface of the Earth from the north to the south pole and demarcates one calendar day from the next. It passes through the middle of the Pacific Ocean, roughly following the 180° longitude but it deviates to pass around some territories and island groups.

87. (d) 88. (b) 89. (b) 90. (c) 91. (a)

92. (a) 93. (d) 94. (a) 95. (a) 96. (b)

97. (a) 98. (c) 99. (a) 100. (c) 101. (b)

102. (a) 103. (c) 104. (d) 105. (b) 106. (d)

107. (c) 108. (a) 109. (a)

110. (b) A citizen has the right to 'move the supreme court' (under article 32) directly in case s/he faces any violation of his/her fundamental rights.

111. (c) Bhairon Singh Shekhawat was the 11th Vice-President of India. He served in that position from August 2002, when he was elected to a five-year term, until he resigned on July 21, 2007, after losing the presidential election to Pratibha Patil.

112. (a) 113. (a) 114. (c) 115. (d) 116. (a)

117. (d) 118. (b) 119. (b) 120. (b)