

HELD ON 19-05-2013 (Morning Shift)

GENERAL INTELLIGENCE & REASONING

Directions (1-3) : In each of the following questions, select the related letters/ word/ number from the given alternatives.

1. Wine : Grape :: Whiskey : ?
(1) Orange (2) Potato
(3) Oats (4) Apple
2. 600 : 2000 :: ? : 9000
(1) 3000 (2) 3600
(3) 5400 (4) 5600
3. XZG : CAT :: DOG : ?
(1) TIW (2) GAD
(3) OWT (4) WLT

Directions (4-5) : In each of the following questions, which one set of letters when sequentially placed at the gaps in the given letter series shall complete it ?

4. _ aabab _ ab _ ab _ bba
(1) bbaa (2) baaa
(3) abaa (4) abba
5. aa _ baa _ aaa _ ba _ ba
(1) abba (2) abab
(3) abaa (4) babb

Directions (6-9) : In each of the following questions, a series is given, with one term missing. Choose the correct alternative from the given ones that will complete the series.

6. C2E, E5H, G12K, I27N, ?
(1) I58P (2) J58Q
(3) K58Q (4) I57Q
7. BEH, DGJ, NQT, ?
(1) TKL (2) GHD
(3) JMP (4) RMO
8. ZA₅, Y₄B, XC₆, W₃D, ?
(1) VE₇ (2) E₇V
(3) V₂E (4) VE₅
9. deb, i jg, nol ? , xyv
(1) stq (2) rsp
(3) rsq (4) stp

Directions (10-14) : In each of the following questions, find the odd word/number pair from the given alternatives.

10. (1) 543, 453
(2) 243, 432
(3) 234, 342
(4) 354, 543
11. (1) Vedanthangal
(2) Bandipur
(3) Mudumalai
(4) Thekkady
12. (1) Internet Explorer
(2) Chrome
(3) Google
(4) Firefox
13. (1) Opponent
(2) Adversary
(3) Ally
(4) Antagonist
14. (1) Pentagon (2) Circle
(3) Rhombus (4) Diagonal
15. Find the correct set of numbers from the given alternatives.
(4, 3, 2), (16, 9, 4),
(256, 81, 16), (65536, ?, ?)
(1) 6651, 286
(2) 6561, 256
(3) 1486, 97
(4) 190, 20

Directions (16-21) : In each of the following questions, select the missing number from the given responses.

16. 16 32 48 64
17 34 51 68
18 36 54 ?
(1) 77 (2) 72
(3) 74 (4) 76
17. 2311, 4529, ?, 8989
(1) 7243 (2) 6353
(3) 5662 (4) 6755
18. 21, 30, 38, ?, 51, 56, 60
(1) 80 (2) 35
(3) 55 (4) 45

19. 6, 14, 30, ?
(1) 54 (2) 29
(3) 27 (4) 33
20. 4 5 10
36 2 49 2 ? 2
(1) 144 (2) 55
(3) 100 (4) 64
21. 5 1 25
6 2 18
10 4 25
3 3 ?
(1) 10 (2) 9
(3) 3 (4) 4

22. Six girls are standing in such a way that they form a circle, facing the centre. Subbu is to the left of Pappu, Revathi is between Subbu and Nisha, Aruna is between Pappu and Keerthana. Who is to the left of Pappu ?

- (1) Subbu (2) Keerthana
(3) Nisha (4) Aruna

23. Naseebah runs for 10 km in the eastern direction. She then turns left and starts walking for 6 km. Again, she turns left and starts running for 6 km. Then she turns left and walks again for 6 km. How far is she from the starting point ?

- (1) 4 km (2) 5 km
(3) 6 km (4) 3 km

24. In the following problem,

- = stands for +
+ stands for -
x stands for =
- stands for >
> stands for +
< stands for x
÷ stands for <

When these new symbols are substituted, only one will be wrong. Identify the **wrong** one.

- (1) $4 < 2 + 5 + 8 \times 5$
(2) $4 = 2 + 5 > 8 \times 5$
(3) $4 < 2 > 5 + 8 \times 5$
(4) $4 > 2 < 5 + 8 - 5$

Directions (25-27) : In each of the following questions, from the given alternative words, select the word which cannot be formed using the letters of the given word.

- 25. TENDENTIOUS**
 (1) INTENTION
 (2) DENTIST
 (3) TENT
 (4) STUDENT
- 26. INTERNATIONAL**
 (1) ORIENTAL (2) RATIONALE
 (3) LATTER (4) TERMINAL

- 27. DEPRECIATE**
 (1) PEACE (2) REPRIEVE
 (3) CREDIT (4) PRIDE
- 28. Select the correct combination of mathematical signs to replace * signs and to balance the given equation.**

$8 * 6 * 96 * 2 = 0$
 (1) $\times \div -$ (2) $\times - \div$
 (3) $- \times \div$ (4) $\div - \times$

- 29. If P denotes \div , Q denotes \times , R denotes $+$ and S denotes $-$, then $12 Q 15 P 3 R 4 S 6 = ?$**
 (1) 70 (2) 57
 (3) 58 (4) 68

- 30. You have to follow the symbolic interpretation to solve the question.**
 $+$ = Greater than
 \times = Equal to
 $-$ = Not less than
 L = Not equal to
 $|$ = Less than
 ϕ = Not greater than
 Then if $A - B \phi C$, which of the following is implied ?
 (1) $A | B + C$ (2) $A | B | C$
 (3) $A + B - C$ (4) $A \phi B | C$

- 31. If A stands for $+$, Q stands for $-$, V stands for \times , R stands for \div , then what is the value of the given equation ?**
 $225 R 5 A 64 Q 13 V 6 = ?$
 (1) 376 (2) 15
 (3) 476 (4) 576

- 32. If each of the letters in the English alphabet is assigned an even numerical value beginning A = 2, B = 4 and so on, what will be the total value of the letters for the word INDIA?**
 (1) 72 (2) 86
 (3) 74 (4) 94

- 33. If 'STYLE' is written as PQVIB, how can 'SMELL' be written in that code ?**

- (1) PJBII (2) PVBII
 (3) PVHII (4) PJHII

- 34. Ram walks 10 m South from his house, turns left and walks 25 m, again turns left and walks 40 m, then turns right and walks 5 m to reach the school. In which direction is the school from his house ?**

- (1) North
 (2) South-West
 (3) North-East
 (4) East

- 35. A boy was misdirected from his way while returning to his home from his school. In order to reach his home, he first moved 3 km in south direction and then turned to his left and moved 2 km in straight direction on the road leading to the east. From there, he moved to his left and walked 3 km. After this, he again turned to his left and moved 1 km. Finally he reached his home. The home of the boy was in which direction from his school ?**

- (1) South (2) West
 (3) North (4) East

- 36. If SENT is written as '+ ^ x -' and ANT is written as '* x -', then how is TEN written in that code ?**

- (1) $\times + -$ (2) $- ^ \times$
 (3) $* - \times$ (4) $- \times ^$

Directions (37-38) : In each of the following questions, a statement is given followed by two conclusions/ assumptions. You have to consider the statement to be true even if it seems to be at variance from commonly known facts. You have to decide which of the given conclusions/ assumptions, if any, follow from the given statement.

- 37. Statement :** If people are intelligent they should be creative.

Assumptions :

- I. Creativity and intelligence are related.
 II. Creative people are intelligent.

- (1) Both assumptions I and II are invalid.

- (2) Only assumption I is valid
 (3) Only assumption II is valid
 (4) Both assumptions I and II are valid.

- 38. Statement :** A friend in need is a friend indeed.

Conclusions :

- I. All are friends in good times.
 II. Enemies in bad times are not friends.

- (1) Neither Conclusion I nor II follows.

- (2) Only Conclusion I follows.

- (3) Only Conclusion II follows.

- (4) Both Conclusions I and II follow.

- 39. Which of the four cubes given in the answer figure can be created by folding the design in question figure ?**

Question Figure :



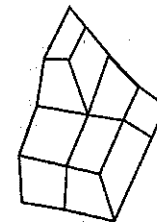
Answer Figures :



- (1) (2) (3) (4)

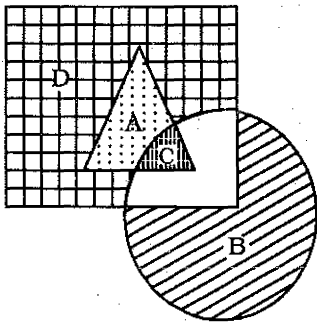
- 40. The figure below is a drawing of a pile of blocks. When taken apart, how many blocks would be there ?**

Question Figure :



- (1) 6 (2) 3
 (3) 4 (4) 5

- 41. In the following diagram, the triangle represents Mothers, circle represents Teachers and the rectangle stands for Women. Which letter (out of A, B, C and D) represents women who are mothers as also teachers ?**



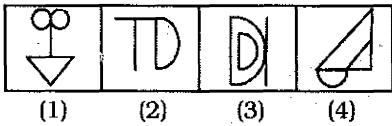
- (1) B (2) D
(3) C (4) A

42. Which of the answer figures is not made up of only the components of the key figure (question figure) ?

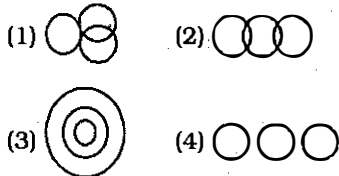
Question Figure :



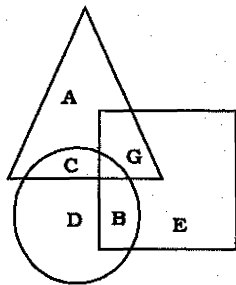
Answer Figures :



43. Which one of the following diagrams represents the correct relationship among Poison, Bio-products and Food ?



44. In the given figure the triangle represents people who visited Mysore, the circle represents people who visited Ooty, the square represents people who visited Munnar. The portion which represents people who visited both Mysore and Ooty is

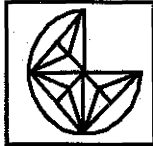


- (1) D (2) G
(3) B (4) C

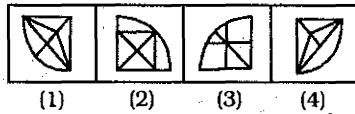
Directions (45-46) : In the following questions, which answer figure will complete the pattern in the question figure.

45. Find out which answer figures will exactly make up the question figure ?

Question Figure :



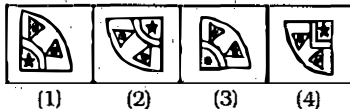
Answer Figures :



46. Question Figure :

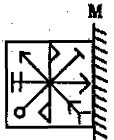


Answer Figures

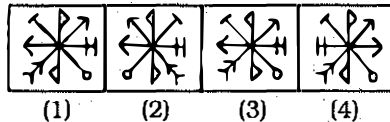


47. From the answer figures, find out the figure which is the exact mirror image of the question figure, when the mirror is placed on the line 'MN'.

Question Figure :



Answer Figures :



48. A word is represented by only one set of numbers as given in any one of the alternatives. The sets of numbers given in the alternatives are represented by two classes of alphabets as in

the matrix given below. The columns and rows of matrix are numbered from 1 to 6. A letter from the matrix can be represented first by its row and next by its column e.g., 'A' can be represented by 42, 46, 62 etc and 'P' can be represented by 15, 43, etc. Similarly, you have to identify the set for the word 'SNOW'.

	1	2	3	4	5	6
1	H	R	E	I	P	S
2	S	G	N	D	Z	J
3	B	U	F	T	K	L
4	V	A	P	C	Y	A
5	M	W	C	O	X	N
6	B	A	E	I	L	O

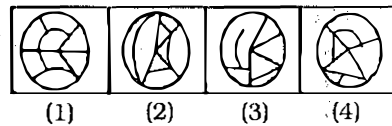
- (1) 21, 14, 22, 56
(2) 21, 56, 62, 44
(3) 16, 56, 46, 35
(4) 21, 23, 54, 52

49. From the given answer figures, select the one in which the question figure is hidden/embedded.

Question Figure :

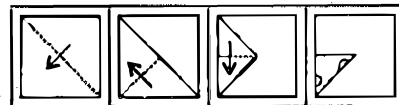


Answer Figures :

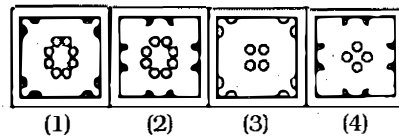


50. A piece of paper is folded and punched as shown below in the question figures. From the given answer figures, indicate how it will appear when opened.

Question Figure :



Answer Figures :



GENERAL AWARENESS

51. Which of the following high dignitaries, who are not members of Parliament, has the right to address it?
(1) Chief Justice of India
(2) Attorney General of India
(3) Solicitor General of India
(4) Chief Election Commissioner of India
52. The Declaration of American Independence was based on the theory of
(1) Civil Rights
(2) Moral Rights
(3) Legal Rights
(4) Natural Rights
53. For which tax, was constitutional status given much later after its introduction in a small way in 1994 - 95?
(1) Customs Duty
(2) Corporation Tax
(3) Taxes on Services
(4) Income Tax
54. The first Sultan who requested and obtained letters of investiture from the Caliph (Khalifa) was
(1) Iltutmish
(2) Balban
(3) Firuz Tughluq
(4) Alauddin Khilji
55. The Buddhist monk who spread Buddhism in Tibet was
(1) Nagarjuna
(2) Ananda
(3) Asanga
(4) Padmasambhava
56. In 1937, an educational conference endorsing Gandhi's proposals for 'basic education' through the vernacular medium was held at
(1) Surat (2) Bombay
(3) Ahmedabad (4) Wardha
57. "What is the Third Estate?" pamphlet associated with the French Revolution, was written by :
(1) Marquis-Lafayette
(2) Edmund Burke
(3) Joseph Foulon
(4) Abbe Sieyes
58. Gandhi's Salt Satyagraha was a part of—
(1) Champaran Satyagraha
(2) Quit India Movement
(3) Non Cooperation Movement
(4) Civil Disobedience Movement
59. Stagflation refers to a situation which is characterised by
(1) stagnant employment and deflation
(2) deflation and rising unemployment
(3) inflation and rising employment.
(4) inflation and rising unemployment
60. The demand for necessities is
(1) elastic
(2) perfectly inelastic
(3) inelastic
(4) perfectly elastic
61. The balance of payments of a country is in equilibrium when the
(1) demand as well as supply of the domestic currency are the highest
(2) demand for the domestic currency is equal to its supply
(3) demand for the domestic currency is the highest
(4) demand for the domestic currency is the lowest
62. Value-added means value of
(1) output at factor cost
(2) output at market prices
(3) goods and services less depreciation
(4) goods and services less cost of intermediate goods and services
63. The difference between GNP and NNP equals
(1) corporate profits
(2) personal taxes
(3) transfer payments
(4) depreciation
64. Who decides a 'bill' is a money bill ?
(1) Prime Minister
(2) Speaker of Lok-Sabha
(3) Chairman of Rajya Sabha
(4) President
65. Which of the following countries is regarded as the home of 'Fabian Socialism'?
(1) Russia
(2) England
(3) France
(4) Italy
66. In plant-water relationships, symbol ' Ψ_w ' is used to represent
(1) Osmotic pressure
(2) Water potential
(3) Solute potential
(4) Osmosis
67. A molecule in plants comparable to haemoglobin in animals is
(1) Cytochrome
(2) Cellulose
(3) Chlorophyll
(4) Carotene
68. An Antigen is
(1) the result of Antibody
(2) the opposite of Antibody
(3) the stimulus for Antibody formation
(4) the residue of an Antibody
69. Blood does not coagulate inside the body due to the presence of
(1) Plasma
(2) Haemoglobin
(3) Heparin
(4) Fibrin
70. The atmospheric layer farthest from the Earth's surface is known as
(1) Stratosphere
(2) Exosphere
(3) Ionosphere
(4) Mesosphere
71. The temperate grasslands of South America are called
(1) Prairies (2) Pampas
(3) Downs (4) Steppes
72. Contours are the lines which are drawn joining places having
(1) equal height from mean sea level
(2) equal rainfall
(3) equal air pressure
(4) equal temperature

73. Soil formed by leaching and oxidation is
 (1) Black soil (2) Laterite soil
 (3) Red soil (4) Montane soil
74. Which strait separates Australia and Tasmania?
 (1) Bass
 (2) Bab-el-Mandeb
 (3) Palk
 (4) Berring
75. Photon is the fundamental unit/quantum of
 (1) gravitation
 (2) electricity
 (3) magnetism
 (4) light
76. A liquid disturbed by stirring comes to rest due to
 (1) density
 (2) surface tension
 (3) viscosity
 (4) centripetal force
77. The nuclear particle having no mass and no charge, but only spin is
 (1) proton (2) neutrino
 (3) meson (4) electron
78. The technology that is used to establish wireless networking is
 (1) TCP/IP (2) J2ME
 (3) MATLAB (4) Bluetooth
79. What is USB ?
 (1) Ultimate Service Bit
 (2) Universal Sent-Bit
 (3) Universal Serial Bus
 (4) Urgent Sent Bit
80. In a period from Li to F, ionisation potential
 (1) cannot be predicted
 (2) increases
 (3) decreases
 (4) remains same
81. Which of the following metals can deposit copper from copper sulphate solution ?
 (1) Platinum (2) Mercury
 (3) Iron (4) Gold
82. Leech is an ectoparasite on cattle, which is
 (1) Carnivorous
 (2) Omnivorous
 (3) Sanguivorous
 (4) Herbivorous
83. How many chambers does a mammalian heart have ?
 (1) 4 (2) 1
 (3) 2 (4) 3
84. When Arsenic atoms are added to Germanium lattice, it becomes a/an
 (1) Insulator
 (2) Superconductor
 (3) Intrinsic semiconductor
 (4) Extrinsic semiconductor
85. Who won the "Miss World" title for 2012?
 (1) Alexandria Mills
 (2) Vanya Mishra
 (3) Wenxia Yu
 (4) Ivian Sarcos
86. Who was the first Hindi writer to receive Jnanpith Award?
 (1) Mahadevi Verma
 (2) Sumitranandan Pant
 (3) Dr. Ramdhari Singh Dinkar
 (4) S.H. Vatsyayan
87. Who is the author of the book "A Cricketing Life" ?
 (1) Christopher Martin Jenkins
 (2) Sunil Gavaskar
 (3) Kapil Dev
 (4) Tony Greig
88. Which country has three capitals viz. Administrative, Legislative and Judicial?
 (1) Chile (2) Malaysia
 (3) Canada (4) South Africa
89. How many countries in Africa are members of the Organisation of Petroleum Exporting Countries (OPEC)?
 (1) Four (2) One
 (3) Two (4) Three
90. Who is the Chairman of the 14th Finance Commission ?
 (1) D. Subba Rao
 (2) Montek Singh Ahluwalia
 (3) M. Govinda, Rao
 (4) Dr. YV Reddy
91. The largest coral reef in the world is found near the coast of
 (1) Brazil (2) Australia
 (3) Sri Lanka (4) Cuba
92. Which one of the following Indian World Heritage Sites is not in Madhya Pradesh ?
 (1) Khajuraho Temples
 (2) Sun Temple Konark
 (3) Sanchi Stupa
 (4) Rock Shelters of Bhimbetka
93. Which among the following is used to dilute oxygen in the gas cylinders used by divers ?
 (1) Krypton (2) Argon
 (3) Helium (4) Neon
94. Which one of the following does not form oxyacid ?
 (1) Sulphur (2) Chlorine
 (3) Nitrogen (4) Fluorine
95. The release of which of the following into ponds and wells helps in controlling mosquitoes?
 (1) Snail (2) Crab
 (3) Dogfish
 (4) Gambusia fish
96. The ambient air is stable when the ambient lapse rate is
 (1) Neutrally stable
 (2) Hyper-adiabatic
 (3) Sub-adiabatic
 (4) Super-adiabatic
97. Exposure to mixtures of chemicals are greater than expected on the basis of effects of exposure to each chemical individually. This is known as
 (1) Additives (2) Antagonism
 (3) Synergism (4) Independent
98. The filter over which sewage is sprinkled is called as
 (1) Trickling filter
 (2) Percolating filter
 (3) Contact bed
 (4) Intermittent sand filter
99. Who was the captain of the West Indies Cricket team, which won the T-20 World Cup 2012?
 (1) Ravi Rampaul
 (2) Chris Gayle
 (3) Marlon Samuels
 (4) D. Bravo
100. Which football player has won the FIFA World Player Award (FIFA Ballon d'Or) for four years in a row?
 (1) Andres Iniesta
 (2) Cristiano Ronaldo
 (3) Lionel Messi
 (4) Michel Platini

QUANTITATIVE APTITUDE

101. The radius of a circle is a side of a square. The ratio of the areas of the circle and the square is

- (1) $1 : \pi$ (2) $\pi : 1$
 (3) $\pi : 2$ (4) $2 : \pi$

102. How much percent more than the cost price should a shopkeeper mark his goods so that after allowing a discount of 25% on the marked price, he gains 20%?

- (1) 70% (2) 50%
 (3) 60% (4) 55%

103. An article is marked at ₹ 5,000. The shopkeeper allows successive discounts of $x\%$, $y\%$, $z\%$ on it. The net selling price is

(1) ₹ $\frac{(100-x)(100+y)(100+z)}{200}$

(2) ₹ $\frac{(100+x)(100+y)(100-z)}{200}$

(3) ₹ $\frac{(100-x)(100-y)(100-z)}{200}$

(4) ₹ $\frac{(100-x)(100+y)(100-z)}{200}$

104. A shopkeeper offers a discount of 10% on his articles. The marked price of the article is ₹ 450. The selling price should be

- (1) ₹ 395 (2) ₹ 410
 (3) ₹ 405 (4) ₹ 400

105. The ratio of number of balls in bags x, y is 2 : 3. Five balls are taken from bag y and are dropped in bag x . Number of balls are equal in each bag now. Number of balls in each bag now is

- (1) 45 (2) 20
 (3) 30 (4) 25

106. Divide ₹ 2,600 among A, B, C in the ratio $\frac{1}{2} : \frac{1}{3} : \frac{1}{4}$. Find the share of each.

- (1) ₹ 1,200, ₹ 600, ₹ 800
 (2) ₹ 1,200, ₹ 800, ₹ 600
 (3) ₹ 600, ₹ 800, ₹ 1,200
 (4) ₹ 800, ₹ 600, ₹ 1,200

107. A positive integer when divided by 425 gives a remainder 45. When the same number is divided by 17, the remainder will be

- (1) 11 (2) 8
 (3) 9 (4) 10

108. $(256)^{0.16} \times (256)^{0.09}$ is

- (1) 256.25 (2) 4
 (3) 16 (4) 64

109. A can do a piece of work in 6 days. B is 25% more efficient than A. How long would B alone take to finish this work?

- (1) $4\frac{4}{5}$ days (2) $3\frac{1}{3}$ days

- (3) $5\frac{1}{4}$ days (4) $2\frac{2}{3}$ days

110. A, B and C can do a piece of work in 20, 30 and 60 days respectively. In how many days can A do the work if he is assisted by B and C on every third day?

- (1) 10 days (2) 12 days
 (3) 15 days (4) 20 days

111. 2 men and 3 boys can do a piece of work in 10 days while 3 men and 2 boys can do the same work in 8 days. In how many days can 2 men and 1 boy do the work?

- (1) 8 days (2) 7 days

- (3) $12\frac{1}{2}$ days (4) 2 days

112. The perimeter of a rectangular plot is 48 m and area is 108 m². The dimensions of the plot are

- (1) 36 m and 3 m
 (2) 12 m and 9 m
 (3) 27 m and 4 m
 (4) 18 m and 6 m

113. If the total surface area of a hemisphere is 27π square cm, then the radius of the base of the hemisphere is

- (1) $9\sqrt{3}$ cm (2) 3 cm
 (3) $3\sqrt{3}$ cm (4) 9 cm

114. A fraction becomes $\frac{9}{11}$, if 2 is added to both the numerator

and the denominator. If 3 is added to both the numerator and the denominator it be-

comes $\frac{5}{6}$. What is the fraction?

- (1) $\frac{7}{9}$ (2) $\frac{3}{7}$

- (3) $\frac{5}{9}$ (4) $\frac{7}{10}$

115. If $x = 1 - \sqrt{2}$, the value

of $\left(x - \frac{1}{x}\right)^3$ is

- (1) -8 (2) 8

- (3) $2\sqrt{2}$ (4) 1

116. If $\frac{a}{b} + \frac{b}{a} - 1 = 0$, then the value of $a^3 + b^3$ is

- (1) 3 (2) 0

- (3) 1 (4) -1

117. If $x + \frac{1}{x} = 99$, find the value of

$$\frac{100x}{2x^2 + 102x + 2}$$

- (1) $\frac{1}{6}$ (2) $\frac{1}{2}$

- (3) $\frac{1}{3}$ (4) $\frac{1}{4}$

118. If $x = 3 + 2\sqrt{2}$, the value

of $x^2 + \frac{1}{x^2}$ is

- (1) 36 (2) 30

- (3) 32 (4) 34

119. If $(a + b + c) = 0$,

then $\left(\frac{a^2}{bc} + \frac{b^2}{ca} + \frac{c^2}{ab}\right)$ is

- (1) 3 (2) -1

- (3) 0 (4) 1

120. If x and y are positive real numbers and $xy = 8$, then the minimum value of $2x + y$ is

- (1) 9 (2) 17

- (3) 10 (4) 8

121. The graphs of $2x + 1 = 0$ and $3y - 9 = 0$ intersect at the point

(1) $(-\frac{1}{2}, -3)$

(2) $(-\frac{1}{2}, 3)$

(3) $(\frac{1}{2}, -3)$

(4) None of these

122. In triangle ABC, $\angle BAC = 75^\circ$, $\angle ABC = 45^\circ$. \overline{BC} is produced to D. If $\angle ACD = x^\circ$, then

$\frac{x}{3}$ of 60° is

- (1) 30° (2) 48°
(3) 15° (4) 24°

123. Out of four numbers, the average of the first three is 15 and that of the last three is 16. If the last number is 19, the first is

- (1) 19 (2) 15
(3) 16 (4) 18

124. In a family of 5 members, the average age at present is 33 years. The youngest member is 9 years old. The average age of the family just before the birth of the youngest member was

- (1) 30 years (2) 29 years
(3) 25 years (4) 24 years

125. A dishonest dealer professes to sell his goods at the cost price but uses a false weight of 850 g instead of 1 kg. His gain percent is

- (1) $17\frac{12}{17}\%$ (2) $17\frac{11}{17}\%$
(3) $71\frac{11}{17}\%$ (4) $11\frac{11}{17}\%$

126. In a college, 40% of the students were allotted group A, 75% of the remaining were given group B and the remaining 12 students were given group C. Then the number of students who applied for the groups is

- (1) 100 (2) 60
(3) 80 (4) 92

127. A train 150 metres long crosses a milestone in 15 seconds and crosses another train of the same length travelling in

the opposite direction in 12 seconds. The speed of the second train in km/hr is

- (1) 52 (2) 56
(3) 54 (4) 58

128. A person can row a distance of one km upstream in ten minutes and downstream in four minutes. What is the speed of the stream?

- (1) 4.5 km/h (2) 4 km/h
(3) 9 km/h (4) 5.6 km/h

129. A certain sum of money will be doubled in 15 years at the rate of simple interest percent per annum of

- (1) 25 (2) $5\frac{1}{2}$
(3) 6 (4) $6\frac{2}{3}$

130. In an isosceles triangle, if the unequal angle is twice the sum of the equal angles, then each equal angle is

- (1) 120° (2) 60°
(3) 30° (4) 90°

131. At an instant, the length of the shadow of a pole is $\sqrt{3}$ times the height of the pole. The angle of elevation of the Sun at that moment is

- (1) 75° (2) 30°
(3) 45° (4) 60°

132. If θ is positive acute angle and $3(\sec^2\theta + \tan^2\theta) = 5$, then which one is true?

- (1) $\cos 2\theta = \sin 2\theta$
(2) $\cos 2\theta = \sin \theta$
(3) $\cos 2\theta = \tan \theta$
(4) $\cos 2\theta = \cos \theta$

133. Two circles touch each other externally. The distance between their centres is 7 cm. If the radius of one circle is 4 cm, then the radius of the other circle is

- (1) 3.5 cm (2) 3 cm
(3) 4 cm (4) 2 cm

134. In a $\triangle ABC$, $AB = AC$ and BA is produced to D such that $AC = AD$. Then the $\angle BCD$ is

- (1) 100° (2) 60°
(3) 80° (4) 90°

135. In a right-angled triangle ABC, $\angle ABC = 90^\circ$, $AB = 5$ cm and $BC = 12$ cm. The radius of the circumcircle of the triangle ABC is

- (1) 7.5 cm (2) 6 cm
(3) 6.5 cm (4) 7 cm

136. If the circumradius of an equilateral triangle ABC be 8 cm, then the height of the triangle is

- (1) 16 cm (2) 6 cm
(3) 8 cm (4) 12 cm

137. Two circles intersect at A and B. P is a point on produced BA. PT and PQ are tangents to the circles. The relation of PT and PQ is

- (1) $PT = 2PQ$ (2) $PT < PQ$
(3) $PT > PQ$ (4) $PT = PQ$

138. If O is the circumcentre of $\triangle ABC$ and $OD \perp BC$, then $\angle BOD$ must be equal to

- (1) $\angle A$ (2) $\frac{1}{2}\angle A$
(3) $\frac{1}{2}\angle B$ (4) $\frac{1}{2}\angle C$

139. The numerical value of

$$\frac{1}{1 + \cot^2 \theta} + \frac{3}{1 + \tan^2 \theta} + 2 \sin^2 \theta$$

will be

- (1) 2 (2) 5
(3) 6 (4) 3

140. The value of

$$\frac{4}{1 + \tan^2 \alpha} + \frac{3}{1 + \cot^2 \alpha} + 3 \sin^2 \alpha$$

is

- (1) 4 (2) -1
(3) 2 (4) 3

141. The value of $3(\sin x - \cos x)^4 + 6(\sin x + \cos x)^2 + 4(\sin^6 x + \cos^6 x)$ is

- (1) 14 (2) 11
(3) 12 (4) 13

142. The value of

$$\sec \theta \left(\frac{1 + \sin \theta}{\cos \theta} + \frac{\cos \theta}{1 + \sin \theta} \right) - 2 \tan^2 \theta$$

is

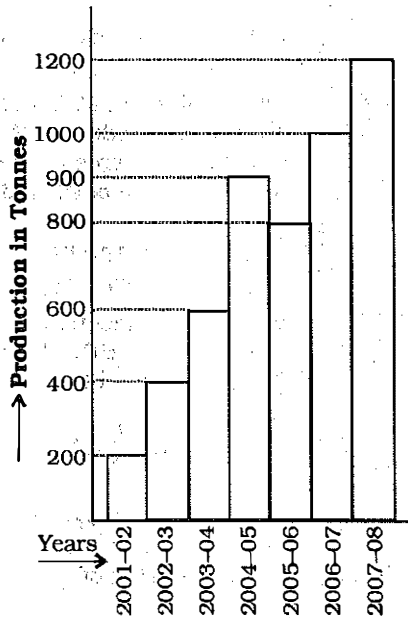
- (1) 4 (2) 1
(3) 2 (4) 0

143. If $\sin \theta + \operatorname{cosec} \theta = 2$ then the value of $\sin^5 \theta + \operatorname{cosec}^5 \theta$ is

- (1) $\frac{1}{2}$ (2) 1
(3) 0 (4) 2

Directions (144 - 147) :

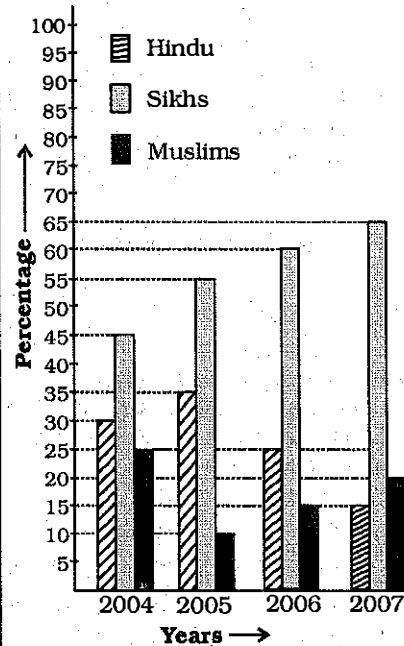
Study the chart carefully and answer the questions.



The chart shows production of an item (in tonnes) during certain years

144. The production in 2006-07 in comparison to the production in 2002-03 increased by
(1) 150% (2) 110%
(3) 120% (4) 125%
145. The production decreased from 2004-05 to 2005-06 by
(1) $11\frac{1}{9}\%$ (2) $8\frac{1}{9}\%$
(3) $9\frac{1}{9}\%$ (4) $10\frac{1}{9}\%$
146. The year in which production increased the lowest as compared to the previous year is
(1) 2007 - 08 (2) 2003 - 04
(3) 2004 - 05 (4) 2006 - 07
147. The production from 2003 - 04 to 2007 - 08 increased by
(1) 125% (2) 50%
(3) 75% (4) 100%

Directions (148 - 150) : The following bar diagram shows the percentage of Hindus, Sikhs and Muslims in a state during the years from 2004 to 2007. Examine the bar diagram and answer the following questions.



148. The ratio between the Hindu and Sikh population in 2004 was
(1) 3 : 5 (2) 1 : 2
(3) 2 : 3 (4) 3 : 4
149. If the total population of the state in 2004 was 5 lakhs, then the Hindu and Muslim population in that year was
(1) 200000
(2) 275000
(3) 250000
(4) 225000
150. If the total population of the state in 2005 was 5 million, then the Hindu population was [1 million = 10,00,000]
(1) 2000000
(2) 1250000
(3) 1500000
(4) 1750000

ENGLISH COMPREHENSION

Directions (151-155) : In the following questions, some parts of the sentences have errors and some are correct. Find out which part of a sentence has an error. The number of that part is the answer. If a sentence is free from error, your answer is (4) i.e. No error.

151. Being a holiday (1)/ we went out (2)/ for a picnic. (3)/ No error. (4)
152. If we have no definite aim before us (1)/ we would only wonder about in aimless pursuits (2)/ and achieve nothing. (3)/ No error. (4)
153. He is anxious not only (1)/ to acquire knowledge (2)/ but also eager to display it. (3)/ No error. (4)
154. I went to (1)/ see the Taj Mahal (2)/ in a moonlit night. (3)/ No error. (4)
155. Having found a piece of cheese, (1)/ two cats went to a dog (2)/ to divide it among them. (3)/ No error. (4)

Directions (156-160) : In the following questions, sentences are given with blanks to be filled with an appropriate word(s). Four alternatives are suggested for each question. Choose the correct alternative out of the four.

156. There is a amount of fatty acids and carbohydrates in some of the imported chocolates.
(1) neglecting (2) negligent
(3) negligible (4) neglected
157. I'm not as successful she is.
(1) then (2) as
(3) like (4) than
158. Many Tamil-speaking Sri Lankans from the island to escape the military and its atrocities.
(1) flown (2) flee
(3) fled (4) flew
159. the new Safari Storme, Mahindra has more leverage in increasing the sales.
(1) With (2) At
(3) On (4) In

160. The passenger car sales showed a decline 7% to 5.6%.
 (1) from (2) for
 (3) of (4) to

Directions (161-163) : In the following questions, out of the four alternatives, choose the one which best expresses the meaning of the given word.

161. Hallucination
 (1) delusion (2) habitat
 (3) dress (4) deception
162. Salacious
 (1) angry (2) unhappy
 (3) satisfied (4) lustful

163. Derive
 (1) contain (2) attain
 (3) sustain (4) obtain

Directions (164-166) : In the following questions, choose the word opposite in meaning to the given word.

164. Retrench
 (1) revamp (2) belie
 (3) deviate (4) recruit

165. Aggravate
 (1) depreciate (2) extinguish
 (3) subsidise (4) alleviate

166. Indelible
 (1) decorous (2) surprising
 (3) concerted (4) temporary

Directions (167-171) : In the following questions, four alternatives are given, for the Idiom/Phrase printed in bold in the sentence. Choose the alternative which best expresses the meaning of the Idiom/Phrase.

167. My ten year-old son is an incredible **live-wire**.
 (1) lazy (2) dangerous
 (3) naughty (4) energetic
168. He had to **cool his heels** before he could get an appointment with the doctor.
 (1) to be kept waiting
 (2) to make publicly known
 (3) to exercise influence
 (4) to lose one's temper
169. The captains of the rival teams should, try to **bury the hatchet**.
 (1) put up a stiff competition
 (2) make peace

- (3) win the game
 (4) forget the past

170. He stopped at the bar to **wet his whistle**.

- (1) have a nap
 (2) be happy
 (3) have a problem
 (4) have a drink

171. Over the years, we remained loyal through **thick and thin**.

- (1) to our principles
 (2) to employers and subordinates
 (3) in married life
 (4) in spite of all the difficulties

Directions (172-181) : In the following questions, a sentence/part of the sentence is printed in bold. Below are given alternatives to the bold sentence/part of the sentence at (1), (2) and (3) which may improve the sentence. Choose, the correct alternative. In case no improvement is needed, your answer is (4).

172. New hires in this laboratory should anticipate excellent research opportunities **and getting** valuable clinical, experience.
 (1) as well as
 (2) and also getting
 (3) and obtaining
 (4) No improvement

173. It is **more better** to take this route than the other one.
 (1) good
 (2) better
 (3) more good
 (4) No improvement

174. **She is absent; she must be sick again**.

- (1) She is absent; she has been sick again
 (2) She is absent: she is sick again
 (3) She is absent; she must have been sick again
 (4) No improvement

175. Jackie has already **gone to the airport she will meet us** at the check-in-counter.

- (1) gone to the airport and Jackie will meet us

- (2) gone to the airport and she will meet us

- (3) gone to the airport she ought to meet us

- (4) No improvement

176. **The place at which the two roads meet**, you will find a small log cabin.

- (1) Where the two roads meet
 (2) At the place where the two roads meet
 (3) The place where the two roads meet
 (4) No improvement

177. The vivid photos of majestic animals and colourful birds from the wild-life park **is a graphic depiction of what is beautiful in** the continent of Africa.

- (1) is a graphic depiction of what was beautiful in
 (2) are graphic depictions of what is beautiful in
 (3) is a beautiful and graphic depiction of
 (4) No improvement

178. Although I was initially apprehensive, **I found the eating of snails to be a rather pleasant experience**.

- (1) I ate the pleasant snail's experience
 (2) I found the snails experienced
 (3) I found it to be a more pleasant experience
 (4) No improvement

179. The man ate **an apple, an orange, and washed his hands**.

- (1) an apple and an orange, and washed his hands
 (2) an apple, an orange, washed his hands
 (3) an apple, an orange and his washed hands
 (4) No improvement

180. After we ate a spectacular nine-course dinner, **three television shows were watched by us**.

- (1) we were watching three television shows
 (2) we engaged in the watching of three shows

- (3) we watched three television shows
 (4) No improvement

181. The Blue Whale, **weighing more than 150 tons, the** largest known animal on Earth.

- (1) weighing more than 150 tons, it is
 (2) weighing more than 150 tons, is the
 (3) which weighs more than 150 tons, being the
 (4) No improvement

Directions (182-188) : In the following questions, out of the four alternatives, choose the one which can be substituted for the given words/sentence.

182. More like a woman than a man in manners and habits

- (1) Unmanly
 (2) Effeminate
 (3) Womanish (4) Delicate

183. Handwriting which is difficult or impossible to read

- (1) Unintelligible
 (2) Eligible
 (3) Illegible
 (4) Illogical

184. To play the part of, and function as, some other person

- (1) Imitate (2) Pretend
 (3) Impersonate (4) Act

185. Not easily pleased by anything

- (1) Fastidious (2) Maiden
 (3) Medieval (4) Precarious

186. To die without having made a will

- (1) Intaglio
 (2) Inveterate
 (3) Intestate
 (4) Insolvent

187. One who enjoys inflicting pain on himself

- (1) masochist (2) nihilist
 (3) egoist (4) sadist

188. Murder of a brother

- (1) Fratricide (2) Patricide
 (3) Regicide (4) Homicide

Directions (189-190) : In the following questions, four words are given in each question, out of which only one word is correctly spelt. Find the correctly spelt word.

- 189.** (1) annihilate
 (2) Annihilate
 (3) anihillate
 (d) Annihillate

- 190.** (1) embarassed
 (2) embarrassed
 (3) embarressed
 (4) embarrased

Directions (191-200) : In the following questions, you have a passage with 10 questions. Read the passage carefully and choose best answer to each question of the four

Many people who are to get a pet dog get a puppy. are many reasons why people puppies. After all, puppies are friendly, and playful. But though puppies make good there are good reasons why should consider getting an dog instead. When you get a puppy, you have to teach it how to behave. You have to make sure the puppy is housebroken so it does not go to the bathroom inside the house. You have to the puppy, not to jump up on guests or chew on your shoes. have to train the puppy to walk a leash. This is a lot of w

On the other hand, when you get an adult dog there is a good chance that it will already know how to do all of the previously mentioned things. Many adult dogs have already been housebroken. Many adult dogs will not jump on or chew things that you do not want them to jump on or chew. Many adult dogs will be able to walk on a leash without pulling you to the other side of the street.

Puppies also have a lot of energy and want to play all of the time. This can be fun, but you might not want to play as much as your puppy does. Puppies will not always sleep through the night or let you relax as you watch television.

On the other hand, most adult dogs will wait on you to play. What is more, they will sleep when you are sleeping and are happy to watch television on the couch right beside you. There is one last reason why

you should get an adult dog instead of a puppy. When most people go to the pound to get a dog, they get a puppy. This means that many adult dogs spend a lot of time in the pound and some never find good homes. So if you are looking to get a dog for a pet, you should think about getting an adult dog. They are good pets who need good homes.

191. Which is the best example of a dog that is housebroken ?

- (1) Muffin chews on people's shoes
 (2) Spot goes outside to use the bathroom
 (3) Rex always breaks things inside the house
 (4) Rover never jumps on guests

192. The author apparently thinks that puppies are

- (1) not as playful as adult dogs
 (2) hardworking
 (3) friendly and playful
 (4) not as cute as adult dogs

193. Which is the best synonym for 'behave' as applicable to this passage?

- (1) act (2) listen
 (3) understand (4) train

194. The passage speaks of

- (1) the work involved in training puppies
 (2) the immature acts of puppies
 (3) how puppies do not make good pets
 (4) how puppies can be very destructive

195. As used in paragraph 3, which is the best synonym for relax ?

- (1) rest (2) work
 (3) leave (4) play

196. The author begins paragraphs 2 and 4 with the phrase, "On the other hand". This phrase is used to

- (1) support the following paragraph
 (2) highlight an example
 (3) contradict previous information
 (4) contradict a later statement

197. In the final paragraph, the author says "many adult dogs spend a lot of time in the pound, and some never find good homes." Based on the passage, why is this most likely?

- (1) People do not want to get a dog that does not have much time left to live.
- (2) People see adult dogs as unhappy and dangerous, while they see puppies as cute and friendly.
- (3) People understand that most adult dogs still need a lot of training before they understand how to behave properly.
- (4) People think that puppies are cute and playful and do not always think about how much work it will take to train them.

198. Based on the information in the passage, it can be understood that someone who owns a puppy must be very

- (1) responsible
- (2) strict
- (3) serious
- (4) optimistic

199. According to the passage, why is it easier to take care of adult dogs than puppies?

- I. Puppies need to learn how to walk well on a leash.
- II. Adult dogs have less energy than puppies.
- III. It is harder for adult dogs to find a home than it is for puppies.

- (1) I, II and III
- (2) I only
- (3) I and II only
- (4) II and III only

200. Based on the information in the passage, which of the following statements is false?

- (1) Adult dogs do not need to eat very much.
- (2) Puppies have a lot of energy.
- (3) Puppies need a lot of attention.
- (4) Adult dogs do not like to play.

ANSWERS

1. (3)	2. (2)	3. (4)	4. (1)
5. (*)	6. (3)	7. (3)	8. (1)
9. (1)	10. (1)	11. (4)	12. (3)
13. (3)	14. (4)	15. (2)	16. (2)
17. (4)	18. (4)	19. (1)	20. (1)
21. (3)	22. (1)	23. (1)	24. (1)
25. (1)	26. (4)	27. (2)	28. (2)
29. (3)	30. (*)	31. (*)	32. (3)
33. (1)	34. (3)	35. (4)	36. (2)
37. (2)	38. (1)	39. (*)	40. (1)
41. (3)	42. (1)	43. (2)	44. (4)
45. (4)	46. (2)	47. (3)	48. (4)
49. (1)	50. (3)	51. (2)	52. (4)
53. (3)	54. (1)	55. (4)	56. (4)
57. (4)	58. (4)	59. (4)	60. (2)
61. (2)	62. (4)	63. (4)	64. (2)
65. (2)	66. (2)	67. (3)	68. (3)
69. (3)	70. (2)	71. (2)	72. (1)
73. (2)	74. (1)	75. (4)	76. (3)
77. (2)	78. (4)	79. (3)	80. (1)
81. (3)	82. (4)	83. (1)	84. (4)
85. (3)	86. (2)	87. (1)	88. (4)
89. (1)	90. (4)	91. (2)	92. (2)
93. (3)	94. (4)	95. (4)	96. (3)
97. (3)	98. (1)	99. (*)	100. (3)
101. (2)	102. (3)	103. (3)	104. (3)
105. (2)	106. (2)	107. (1)	108. (2)
109. (1)	110. (3)	111. (3)	112. (4)
113. (2)	114. (1)	115. (2)	116. (2)
117. (3)	118. (4)	119. (1)	120. (4)
121. (2)	122. (4)	123. (3)	124. (1)
125. (2)	126. (3)	127. (3)	128. (1)
129. (4)	130. (3)	131. (2)	132. (2)
133. (2)	134. (4)	135. (3)	136. (4)
137. (4)	138. (1)	139. (4)	140. (1)
141. (4)	142. (3)	143. (4)	144. (1)
145. (1)	146. (1)	147. (4)	148. (3)
149. (2)	150. (4)	151. (1)	152. (2)
153. (1)	154. (4)	155. (3)	156. (3)
157. (2)	158. (3)	159. (1)	160. (1)
161. (1)	162. (4)	163. (3)	164. (4)
165. (4)	166. (4)	167. (4)	168. (1)
169. (2)	170. (4)	171. (4)	172. (1)
173. (2)	174. (4)	175. (2)	176. (1)
177. (2)	178. (3)	179. (1)	180. (3)
181. (2)	182. (2)	183. (3)	184. (3)
185. (1)	186. (3)	187. (1)	188. (1)
189. (2)	190. (3)	191. (2)	192. (3)
193. (1)	194. (2)	195. (1)	196. (3)
197. (4)	198. (1)	199. (1)	200. (1)

EXPLANATIONS

1. (3) Wine is a fermented grape juice used as an alcoholic drink. Whiskey refers to a spirit distilled especially from malted barley (oats).

2. (2) $200 \times 3 = 600$
 $200 \times 10 = 2000$

Similarly,
 $900 \times 4 = 3600$
 $900 \times 10 = 9000$

3. (4) X Z G → C A T

Pairs of Opposite letters.
 Similarly,

D O G → W L T

4. (1) b a a b a b b a /

b a a b a b b a

5. (*) a a b b a a b a /

a a b b a a b a

6. (3)

C $+2$ → E $+2$ → G $+2$ → I $+2$ → K
 2 $+3$ → 5 $+7$ → 12 $+15$ → 27 $+31$ → 58
 E $+3$ → H $+3$ → K $+3$ → N $+3$ → Q

7. (3) B $+3$ → E $+3$ → H

D $+3$ → G $+3$ → J

N $+3$ → Q $+3$ → T

J $+3$ → M $+3$ → P

8. (1)

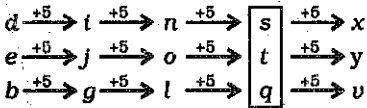
Z -1 → Y -1 → X -1 → W -1 → V
 A $+1$ → B $+1$ → C $+1$ → D $+1$ → E

-1

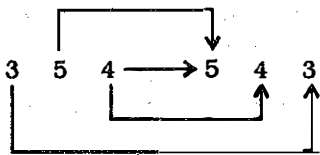
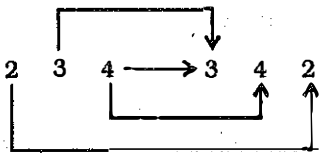
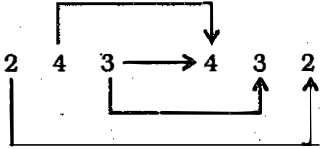
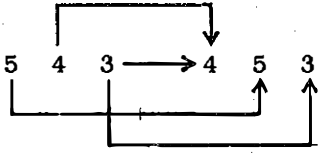
$+1$ $+1$

Therefore, ? ⇒ VE₇

9. (1)



10. (1)



11. (4) Vedanthangal, Bandipur and Mudumalai are National Parks or Wildlife Sanctuaries. Bandipur National Park is situated in Mysore, Karnataka. Mudumalai Wildlife Sanctuary and Vedanthangal Bird Sanctuary are located in Tamil Nadu.

12. (3) Google is a search engine while all others are web browsers.

13. (3) Ally is different from the other three words.

14. (4) Diagonal is a part of geometrical figure. All others are plane figures.

15. (2) $(4)^2 = 16$; $(16)^2 = 256$ and $(256)^2 = 65536$
 $(3)^2 = 9$; $(9)^2 = 81$ and $(81)^2 = 6561$
 $(2)^2 = 4$; $(4)^2 = 16$ and $(16)^2 = 256$

16. (2) First Row

$$16 \times 2 = 32; 16 \times 3; 16 \times 4 = 64$$

Second Row

$$17 \times 2 = 34;$$

$$17 \times 3 = 51; 17 \times 4 = 68$$

Third Row

$$18 \times 2 = 36; 18 \times 3 = 54$$

$$18 \times 4 = 72$$

17. (4) $2311 + 2218 = 4529$

$$4529 + 2226 = \boxed{6755}$$

$$6755 + 2234 = 8989$$

18. (4) $21 + 9 = 30$

$$30 + 8 = 38$$

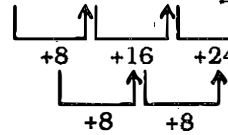
$$38 + 7 = \boxed{45}$$

$$45 + 6 = 51$$

$$51 + 5 = 56$$

$$56 + 4 = 60$$

19. (1) $6 \rightarrow 14 \rightarrow 30 \rightarrow \boxed{54}$



20. (1) $4 \rightarrow 36 \leftarrow 2$

$$(4 + 2)^2 = (6)^2 = 36$$

$$5 \rightarrow 49 \leftarrow 2$$

$$(5 + 2)^2 = (7)^2 = 49$$

$$10 \rightarrow ? \leftarrow 2$$

$$(10 + 2)^2 = (12)^2 = 144$$

21. (3) First Row

$$5 \times 5 = 25 \rightarrow \text{Third number}$$

Second Row

$$6 \times 3 = 18 \rightarrow \text{Third number}$$

$$[5 - 2 = 3]$$

Third Row

$$10 \times 2.5 = 25 \rightarrow \text{Third number}$$

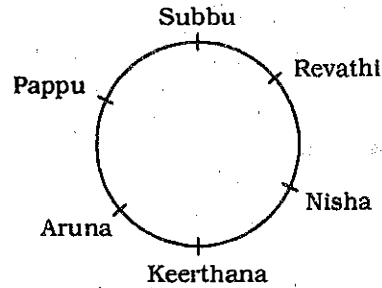
$$[3 - 0.5 = 2.5]$$

Fourth Row

$$3 \times 1 = 3 \rightarrow \text{Third number}$$

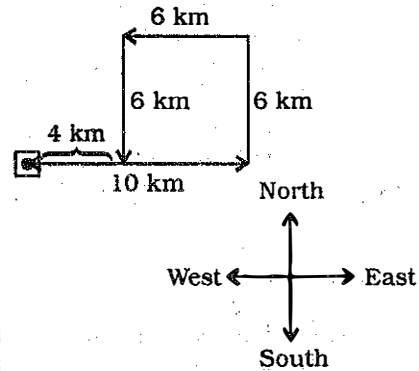
$$[2.5 - 1.5 = 1]$$

22. (1)



Subbu is to the left of Pappu.

23. (1)



Required distance = 4 km

24. (1)

$= \Rightarrow +$	$+ \Rightarrow -$	$\times \Rightarrow =$	$- \Rightarrow >$
$> \Rightarrow +$	$< \Rightarrow \times$	$+ \Rightarrow <$	

Option (1)

$$4 < 2 + 5 + 8 \times 5$$

$$\Rightarrow 4 \times 2 - 5 - 8 = 5$$

$$\Rightarrow 8 - 5 - 8 \neq 5$$

Option (2)

$$4 = 2 + 5 > 8 \times 5$$

$$\Rightarrow 4 + 2 - 5 + 8 = 5$$

$$\Rightarrow 2 - 5 + 8 = 5$$

Option (3)

$$4 < 2 > 5 + 8 \times 5$$

$$\Rightarrow 4 \times 2 + 5 - 8 = 5$$

$$\Rightarrow 8 + 5 - 8 = 5$$

Option (4)

$$4 > 2 < 5 + 8 - 5$$

$$\Rightarrow 4 + 2 \times 5 - 8 > 5$$

$$\Rightarrow 4 + 10 - 8 > 5$$

$$\Rightarrow 14 - 8 > 5$$

$$\Rightarrow 6 > 5$$

25. (1) There are three Ns and two Is in the word INTENTION. But in the given word there are only two Ns and one I.

26. (4) There is no 'M' letter in the given word. Therefore, the word TERMINAL cannot be formed.

27. (2) There is no 'V' letter in the given word. Therefore, the word REPRIEVE cannot be formed.

28. (2) $8 * 6 * 96 * 2 = 0$
 $\Rightarrow 8 \times 6 - 96 \div 2 = 0$
 $\Rightarrow 48 - 48 = 0$

29. (3)

P $\Rightarrow +$	Q $\Rightarrow \times$
R $\Rightarrow +$	S $\Rightarrow -$

$12 \text{ Q } 15 \text{ P } 3 \text{ R } 4 \text{ S } 6 = ?$
 $\Rightarrow 12 \times 15 \div 3 + 4 - 6$
 $\Rightarrow 12 \times 5 + 4 - 6$

$\Rightarrow 60 + 4 - 6 = \boxed{58}$

30. (*)

$+ \Rightarrow >$	$\times \Rightarrow =$	$- \Rightarrow \geq$
$L \Rightarrow \neq$	$ \Rightarrow <$	$\phi \Rightarrow \leq$

A - B ϕ C
 $\Rightarrow A \geq B \leq C$
 $\Rightarrow A > B < C$ or, $A > B = C$
or, $A = B = C$ or, $A = B < C$

Option (1)
A | B + C
 $\Rightarrow A < B > C$: Not True

Option (2)
A | B | C
 $\Rightarrow A < B < C$: Not True

Option (3)
A + B - C
 $\Rightarrow A > B \geq C$
 $\Rightarrow A > B = C$
or, $A > B > C$

Option (4)
A ϕ B | C
 $\Rightarrow A \leq B < C$
 $\Rightarrow A < B < C$
or, $A = B < C$

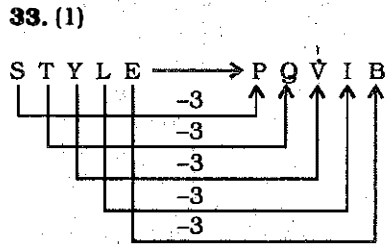
Both the options (3) and (4) may be true.

31. (*)

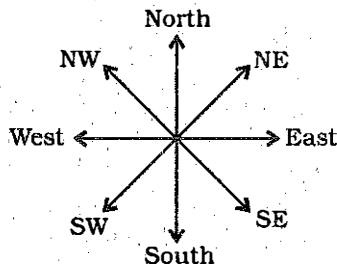
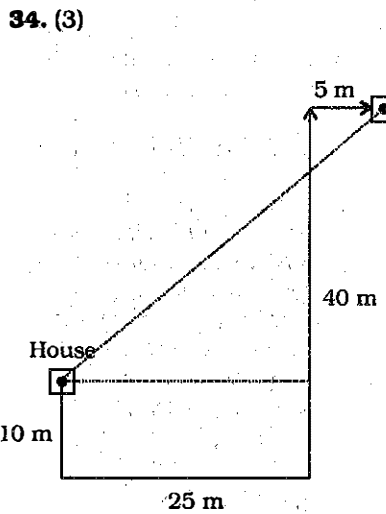
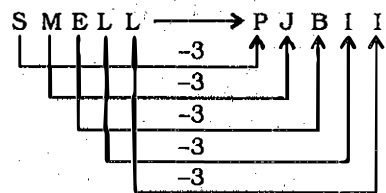
A $\Rightarrow +$	Q $\Rightarrow -$
V $\Rightarrow \times$	R $\Rightarrow +$

$225 \text{ R } 5 \text{ A } 64 \text{ Q } 13 \text{ V } 6 = ?$
 $\Rightarrow ? = 225 \div 5 + 64 - 13 \times 6$
 $\Rightarrow ? = 45 + 64 - 78 = \boxed{31}$

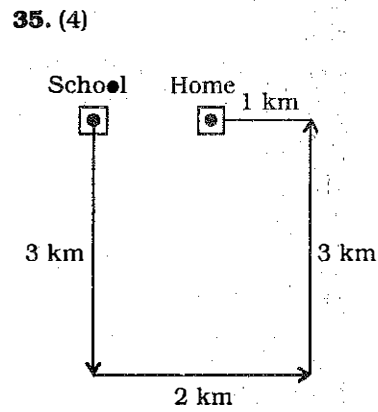
32. (3) I $\Rightarrow 09 \times 02 = 18$
N $\Rightarrow 14 \times 02 = 28$
D $\Rightarrow 04 \times 02 = 08$
I $\Rightarrow 09 \times 02 = 18$
A $\Rightarrow 01 \times 02 = 02$
74



Similarly,



It is clear from the diagram that school is in North-East direction from Ram's house.



The home of boy was in east direction from his school.

36. (2) S E N T
 $\downarrow \downarrow \downarrow \downarrow$
+ ^ x -
Therefore,
T E N
 $\downarrow \downarrow \downarrow$
- ^ x

37. (2) Only assumption I is valid. It is clear that creativity and intelligence are related. Assumption II is not an assumption at all. It is mere re-statement of the given statement.

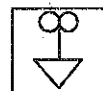
38. (1) A friend who offers help in time of need is a true friend. The use of term 'All' in Conclusion I makes it invalid. Conclusion II does not express the inherent meaning of the statement. Therefore, neither Conclusion I nor II follows.

39. (*) If we fold the given pattern the cube will resemble Answer Figures (2) and (3).

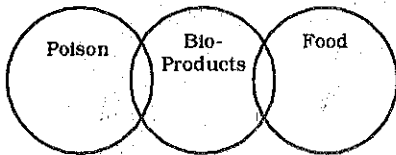
40. (1) Five blocks are visible and one block is hidden.

41. (3) Women who are mothers as well as teachers can be represented by C.

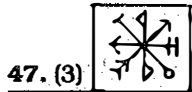
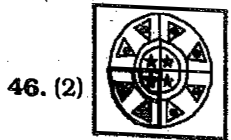
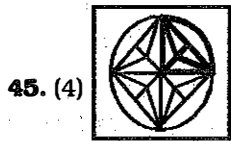
42. (1) Answer Figure (1) cannot be formed.



43. (2) Some bio-products are food while some other bio-products are poison.

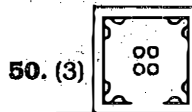
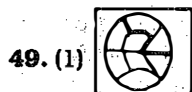


44. (4) The required portion should be common to the triangle and the circle. Such portion is marked 'C'.



48. (4) S \Rightarrow 16, 21
 N \Rightarrow 23, 56
 O \Rightarrow 54, 66
 W \Rightarrow 52

Option	S	N	O	W
(1)	21	23	54	56
(2)	21	56	54	66
(3)	16	56	23	66
(4)	21	23	54	52



51. (2) The Attorney General has the right of audience in all Courts in India as well as the right to participate in the proceedings of the Parliament, though not to vote. He appears on behalf of Government of India in all cases in the Supreme Court in which Government of India is concerned.

52. (4) The declaration contained 3 sections: a general statement of natural rights theory and the purpose of government, a list of grievances against the British King, and the declaration of independence from England. These rights are found in eternal "Laws of Nature and of Nature's God."

53. (3) Dr. Manmohan Singh, the then Union Finance Minister, in his Budget speech for the year 1994-95 introduced the new concept of Service Tax. It was given constitutional status by Chapter VA of the Finance Act, 2003.

54. (1) Sultan Iltutmish was the first to obtain letter of investiture from Abbasid Caliphate in 1229 A.D. The sanction recognized him as the lieutenant of the faithful.

55. (4) The most important event in the history of Tibetan Buddhism was the arrival of sage Padmasambhava in the 8th century. Padmasambhava translated numerous Buddhist texts into Tibetan language and combined tantric Buddhism with the local Bon religion to create what is today widely known as the Tibetan Buddhism.

56. (4) On July 31, 1937, Gandhi had published an article in the Harijan. Based upon this article, an all India National Education Conference was held on October 22 and 23, 1937, which was called the Wardha Educational Conference.

57. (4) What Is the Third Estate? is a political pamphlet written by French thinker and clergyman Abbe Emmanuel Joseph Sieyes in January 1789, shortly before the outbreak of the French Revolution. In the pamphlet, Sieyes argued that the Third Estate - the common people of France - constituted a complete nation.

58. (4) The Salt March which began with the Dandi March on March 12, 1930, was a direct action campaign of tax resistance and nonviolent protest against the British salt monopoly in colonial India. It triggered the wider Civil Disobedience Movement.

59. (4) Stagflation describes a situation where an inflation rate is high, the economic growth rate slows down, and unemployment remains steadily high. It raises a dilemma for economic policy since actions designed to lower inflation may exacerbate unemployment, and vice versa.

60. (2) Inelastic demand means that if the price changes, the quantity demanded will not change much. The more necessary a good is, the lower the elasticity, as people will attempt to buy it no matter the price. Necessities such as water are likely to have perfectly inelastic demand.

61. (2) When the balance of payments (BOP) of a country is in equilibrium, the surplus or deficit is eliminated from the BOP. When the BOP of a country is in equilibrium, the demand for domestic currency is equal to its supply. The demand and supply situation is thus neither favourable nor unfavourable.

62. (4) Value added is an economic term to express the difference between the value of goods and the cost of materials or supplies that are used in producing them. It is a measure of economic activity which eliminates the duplication inherent in the sales value figure which results from the use of products of some establishments as materials or services by others. So it is of goods and services less cost of intermediate goods and services.

- 63.** (4) Gross National Product [GNP] is the gross value of all the final products without deducting the depreciation of fixed capital. Net National Product [NNP] is the value of net output in an economy during a period of one year. The difference between the GNP and NNP is equal to Capital depreciation.
- 64.** (2) The Speaker of the Lok Sabha certifies if a Finance bill is a Money Bill or not within article 110 of the Constitution of India.
- 65.** (2) The Fabian Society is a British socialist organization whose purpose is to advance the principles of socialism via gradualist and reformist, rather than revolutionary, means. It is best known for its initial ground-breaking work beginning late in the 19th century and continuing up to World War I.
- 66.** (2) Water potential is the potential energy of water per unit volume relative to pure water in reference conditions. Water potential quantifies the tendency of water to move from one area to another due to osmosis, gravity, mechanical pressure, or matrix effects such as surface tension. Water potential is typically expressed in potential energy per unit volume and very often is represented by the Greek letter ψ .
- 67.** (3) Hemoglobin is the iron-containing oxygen-transport metalloprotein in the red blood cells of all vertebrates. Similarly, Cytochromes are, in general, membrane-bound heme-proteins containing heme groups and are primarily responsible for the generation of ATP via electron transport.
- 68.** (3) Antigens are defined as substances recognized by the body as foreign, causing the body to produce an antibody to react specifically with it. Antibodies are proteins produced by lymphocytes as a result of stimulation by an antigen which can then interact specifically with that particular antigen.
- 69.** (3) Heparin is a naturally-occurring anticoagulant produced by basophils and mast cells. Heparin acts as an anticoagulant, preventing the formation of clots and extension of existing clots within the blood. Heparin is present in the walls of blood vessels where it doesn't allow blood to clot.
- 70.** (2) Extending from the top of the thermosphere to 10,000 km above the earth is the exosphere which is farthest from the Earth. This layer has very few atmospheric molecules, which can escape into space.
- 71.** (2) Temperate grasslands, include the Prairie and Pacific Grasslands of North America, the Pampas of Argentina, Brazil and Uruguay, calcareous downland, and the steppes of Europe. The Pampas of South America are a grassland biome.
- 72.** (1) A line drawn on a map to join up all the places that are the same height above sea level is called a contour. Contour lines are isolines joining places that have the same height value.
- 73.** (2) Laterisation is a form of chemical weathering that involves oxidation, carbonation and leaching. This natural process results in the formation of Laterite soils.
- 74.** (1) Bass Strait is a sea strait separating Tasmania from the south of the Australian mainland, specifically the state of Victoria. Its maximum width is 240 km, its depth is 50-70 m.
- 75.** (4) A photon is an elementary particle, the quantum of light and all other forms of electromagnetic radiation. The modern photon concept was developed gradually by Albert Einstein.
- 76.** (3) It happens because of viscosity. The viscosity of a fluid is a measure of its resistance to gradual deformation by shear stress or tensile stress. It is due to friction between neighboring parcels of the fluid that are moving at different velocities.
- 77.** (2) Neutrinos do not carry electric charge, and have mass quite small, though non-zero. Their mass is tiny even by the standards of subatomic particles. They are electrically neutral, weakly interacting elementary subatomic particles with half-integer spin.
- 78.** (4) Bluetooth is a wireless technology standard for exchanging data over short distances, creating personal area networks (PANs) with high levels of security. It can connect several devices, overcoming problems of synchronization.
- 79.** (3) Universal Serial Bus (USB) is an industry standard developed in the mid-1990s that defines the cables, connectors and communications protocols used in a bus for connection, communication and power supply between computers and electronic devices. USB was designed to standardize the connection of computer peripherals to personal computers, both to communicate and to supply electric power.
- 80.** (1) Ionization energy increases along a period with increase in atomic number. However, in the periodic table, going from left to right, while the Ionization Potential of Li is 5.4 eV, that of Be: 9.3 eV, B: 8.3 eV, C: 11.3 eV, N: 14.6 eV, O: 13.6 eV, and F: 17.0 eV.
- 81.** (3) The iron displaces copper from its salt, to make iron sulfate solution and deposit a thin coating of metallic copper on the surface of the metal. In general, any metal higher than copper in the "electromotive series" will displace copper from copper sulfate solution.

82. (4) A herbivore is an organism anatomically and physiologically adapted to plant material, for example foliage, as the main component of its diet. Cattle are herbivorous animals.
83. (1) Most mammalian hearts are structured similarly to the human heart. There are 4 chambers found within the mammalian heart: the left atrium, right atrium, left ventricle, and right ventricle.
84. (4) When a pentavalent (donor) impurity, like arsenic, is added to germanium, it will form covalent bonds with the germanium atoms, leaving 1 electron relatively free in the crystal structure. Pure germanium may be converted into an N-type semiconductor by "doping" it with any donor impurity having 5 valence electrons in its outer shell. Semiconductors which are doped in this manner - either with N- or P-type impurities - are referred to as EXTRINSIC semiconductors.
85. (3) Miss China, Wenxia Yu won the title of Miss World 2012 while Miss Wales Sophie Elizabeth Moulds and Miss Australia Jessica Michelle Kahawaty came second and third respectively. Miss China had to compete with 116 candidates to win the crown.
86. (2) In 1968, Sumitranandan Pant received the Jnanpith Award for 'Chidambara,' becoming the first Hindi writer to have achieved this award. Pant was considered one of the major poets of the Chhayavadi school of Hindi literature.
87. (1) 'A Cricketing Life' is the autobiography of Christopher Martin-Jenkins. In this book, he covers his work as a written journalist - cricket correspondent of The Times and Daily Telegraph - editor of The Cricketer, BBC cricket correspondent and Test Match Special commentator.
88. (4) South Africa divides its governmental power among three capitals. Bloemfontein is the capital of the judiciary, Cape Town is the legislative capital, and Pretoria is the administrative capital.
89. (1) OPEC has twelve member countries: six in the Middle East, four in Africa, and two in South America. The African states in OPEC are: Nigeria, Algeria, Angola and Libya.
90. (4) The government, in January 2013, announced the constitution of the 14th Finance Commission under the chairmanship of former RBI Governor Y. V. Reddy. The five-member panel is to submit its report by October 31, 2014.
91. (2) The world's largest coral reef is the Great Barrier Reef, located just off the northeastern coast of Australia. This coral reef system is composed of over 2,900 individual reefs and 900 islands.
92. (2) Konark Sun Temple is a 13th century Sun Temple, at Konark, in Odisha. It was constructed from oxidized and weathered ferruginous sandstone by King Narasimhadeva I of the Eastern Ganga Dynasty.
93. (3) Helium is used to dilute the oxygen and nitrogen to reduce these affects. Helium is the gas of choice to use because it is an inert gas, is thinner, therefore more compressible than air, and its narcotic properties are negligible in comparison to nitrogen.
94. (4) Fluorine cannot form oxyacid because fluorine is more electronegative than oxygen. For oxygen to bind, it must be a positively charged ion.
95. (4) The Gambusia fish, also known as mosquitofish, feeds on the larvae of mosquitoes. So it helps in controlling their population. Mosquitofish were introduced directly into ecosystems in many parts of the world as a bio-control to lower mosquito populations which in turn negatively affected many other species in each distinct bioregion.
96. (3) If the environmental lapse rate is greater than -5.5 K/km , then there is some small amount of vertical turbulence and the atmosphere is said to be stable. It is also referred to as being sub-adiabatic.
97. (3) When the toxic effect of the mixture is greater than that expected for the sum of individual constituent doses, which is that effects of combined doses are more-than-additive, the interactions are said to be synergistic. Conversely, when the toxic effect of the mixture is less than that expected under the dose additivity assumption, the interactions are said to be antagonistic.
98. (1) A trickling filter, also known as percolating filter, is an artificial bed of stone or broken brick material over which waste water or sewage is allowed to sprinkle or to trickle. It is then collected through the under drainage system.
99. (*) Darren Sammy was the captain of the West Indies side that won the ICC 2012 T-20 World Cup, their first major trophy for 8 years. West Indies beat Sri Lanka in the final to win the coveted cup.
100. (3) Lionel Messi won the FIFA Ballon d'Or award for the fourth time in a row in January 2013. Messi's fourth award lifted him above three-time FIFA winners Zinedine Zidane of France and Brazil's Ronaldo.

101. (2) Radius of circle = Side of square = r units
 \therefore Area of circle : Area of square
 $= \pi r^2 : r^2$
 $= \pi : 1$

102. (3) C.P. of article = Rs. 100
 If the marked price of article be Rs. x , then

$$x \times \frac{75}{100} = 120$$

$$\Rightarrow x = \frac{120 \times 100}{75} = 160$$

i.e. 60% above the cost price

103. (3) Required S.P.

$$= 5000 \times \frac{(100-x)}{100} \times \frac{(100-y)}{100} \times \frac{(100-z)}{100}$$

$$= \text{Rs.} \left(\frac{(100-x)(100-y)(100-z)}{200} \right)$$

104. (3) S.P. of article = $\frac{450 \times 90}{100}$

$$= \text{Rs. } 405$$

105. (2) Number of balls in bags x and y respectively = $2a$ and $3a$

$$\therefore 3a - 5 = 2a + 3$$

$$\Rightarrow a = 5 + 3 = 8$$

\therefore Total number of balls

$$= 5a = 40$$

\therefore Balls in each bag = 20

106. (2) $A : B : C = \frac{1}{2} : \frac{1}{3} : \frac{1}{4}$

$$= \frac{1}{2} \times 12 : \frac{1}{3} \times 12 : \frac{1}{4} \times 12$$

[LCM of 2, 3 and 4 = 12]

$$= 6 : 4 : 3$$

$$\text{A's share} = \frac{6}{13} \times 2600$$

$$= \text{Rs. } 1200$$

$$\text{B's share} = \frac{4}{13} \times 2600$$

$$= \text{Rs. } 800$$

$$\text{C's share} = \frac{3}{13} \times 2600$$

$$= \text{Rs. } 600$$

107. (1) First divisor (425) is multiple of second divisor (17).

\therefore Required remainder = Remainder obtained on dividing 45 by 17 = 11

108. (2) Expression = $(256)^{0.16} \times (256)^{0.09}$
 $= (256)^{0.16+0.09}$
 $= (256)^{0.25}$
 $= (4^4)^{1/4} = 4$

109. (1) Ratio of A's and B's efficiency = 4 : 5

Ratio of time taken = 5 : 4

$$\therefore \text{Time taken by B} = \frac{6 \times 4}{5}$$

$$= \frac{24}{5} = 4 \frac{4}{5} \text{ days}$$

110. (3) (A + B + C)'s 1 day's work

$$= \frac{1}{20} + \frac{1}{30} + \frac{1}{60} = \frac{3+2+1}{60}$$

$$= \frac{1}{10}$$

$$\text{A's 2 days' work} = \frac{2}{20} = \frac{1}{10}$$

Work done in first three days

$$= \frac{1}{10} + \frac{1}{10} + \frac{2}{20} = \frac{1}{5}$$

Hence, the work will be finished in 15 days.

111. (3) According to the question, 20 men + 30 boys = 24 men + 16 boys

$$\therefore 4 \text{ men} = 14 \text{ boys}$$

$$\therefore 2 \text{ men} = 7 \text{ boys}$$

$$\therefore 2 \text{ men} + 1 \text{ boy} = 8 \text{ boys}$$

$$2 \text{ men} + 3 \text{ boys} = 10 \text{ boys}$$

$$\therefore M_1 D_1 = M_2 D_2$$

$$\Rightarrow 10 \times 10 = 8 \times D_2$$

$$\Rightarrow D_2 = \frac{10 \times 10}{8} = \frac{25}{2}$$

$$= 12 \frac{1}{2} \text{ days}$$

112. (4) If the length and breadth of the plot be x and y respectively, then

$$2(x+y) = 48$$

$$\Rightarrow x+y = 24 \dots\dots(i)$$

$$xy = 108 \dots\dots(ii)$$

$$\therefore (x-y)^2 = (x+y)^2 - 4xy$$

$$= (24)^2 - 4 \times 108$$

$$= 576 - 432 = 144$$

$$\therefore x-y = 12 \dots\dots(iii)$$

From equations (i) and (iii),

$x = 18$ metre and $y = 6$ metre

113. (2) If the radius of hemisphere be r cm, then

$$2\pi r^2 + \pi r^2 = 27\pi$$

$$\Rightarrow 3\pi r^2 = 27\pi$$

$$\Rightarrow 3r^2 = 27$$

$$\Rightarrow r^2 = 9$$

$$\therefore r = \sqrt{9} = 3 \text{ cm}$$

114. (1) Solve this question by options.

$$\text{Original fraction} = \frac{7}{9}$$

Adding 2 to numerator and

$$\text{denominator, fraction} = \frac{9}{11}$$

Adding 3 to numerator and

$$\text{denominator, fraction} = \frac{10}{12}$$

$$= \frac{5}{6}$$

115. (2) $x = 1 - \sqrt{2}$

$$\therefore \frac{1}{x} = \frac{1}{1-\sqrt{2}} \times \frac{1+\sqrt{2}}{1+\sqrt{2}}$$

$$= -1 - \sqrt{2}$$

$$\therefore \left(x - \frac{1}{x}\right)^3$$

$$= (1 - \sqrt{2} + 1 + \sqrt{2})^3$$

$$= 2^3 = 8$$

116. (2) $\frac{a}{b} + \frac{b}{a} - 1 = 0$

$$\Rightarrow \frac{a^2 + b^2 - ab}{ab} = 0$$

$$\Rightarrow a^2 - ab + b^2 = 0$$

$$a^3 + b^3 = (a+b)(a^2 - ab + b^2) = 0$$

117. (3) $x + \frac{1}{x} = 99$

$$\therefore \frac{100x}{2x^2 + 102x + 2}$$

$$= \frac{100x}{2x^2 + 2 + 102x}$$

On dividing by x ,

$$= \frac{100}{2x + \frac{2}{x} + 102}$$

$$= \frac{100}{2\left(x + \frac{1}{x}\right) + 102}$$

$$= \frac{100}{2 \times 99 + 102} = \frac{100}{300} = \frac{1}{3}$$

118. (4) $x = 3 + 2\sqrt{2}$

$$\therefore \frac{1}{x} = \frac{1}{3 + 2\sqrt{2}}$$

$$= \frac{1}{3 + 2\sqrt{2}} \times \frac{3 - 2\sqrt{2}}{3 - 2\sqrt{2}}$$

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

$$= 3 - 2\sqrt{2}$$

$$x + \frac{1}{x} = 3 + 2\sqrt{2} + 3 - 2\sqrt{2} = 6$$

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

$$= (6)^2 - 2 = 36 - 2 = 34$$

119. (1) If $a + b + c = 0$

$$a^3 + b^3 + c^3 - 3abc = 0$$

$$\text{Expression} = \frac{a^2}{bc} + \frac{b^2}{ca} + \frac{c^2}{ab}$$

$$= \frac{a^3 + b^3 + c^3}{abc}$$

$$= \frac{3abc}{abc} = 3$$

120. (4) $xy = 8 = 1 \times 8 = 2 \times 4$

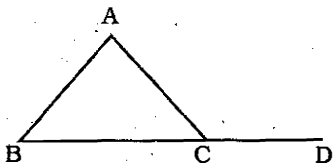
$$= \frac{1}{2} \times 16 = \frac{1}{3} \times 24$$

$$\therefore \text{Minimum value of } 2x + y = 2 \times 2 + 4 = 8$$

121. (2) $2x + 1 = 0 \Rightarrow x = -\frac{1}{2}$

$$\text{and } 3y - 9 = 0 \Rightarrow y = 3$$

122. (4)



$$\angle ACB = 180^\circ - 75^\circ - 45^\circ = 60^\circ$$

$$\angle ACD = 180^\circ - 60^\circ = 120^\circ = x$$

$$\therefore \frac{x}{3} \% \text{ of } 60^\circ$$

$$= 60 \times \frac{120}{300}$$

$$= 24^\circ$$

123. (3) $a + b + c = 45$ and

$$b + c + d = 48$$

$$\Rightarrow b + c = 48 - 19 = 29$$

$$\therefore a + b + c = 45$$

$$\Rightarrow a = 45 - 29 = 16$$

124. (1) Sum of the present ages of family members = 33×5

$$= 165 \text{ years}$$

$$9 \text{ years ago,}$$

$$\text{Sum of their ages}$$

$$= 165 - 9 \times 5$$

$$= 120 \text{ years}$$

$$\therefore \text{Required average age} = \frac{120}{4}$$

$$= 30 \text{ years}$$

125. (2) Profit percent

$$= \frac{150}{1000 - 150} \times 100$$

$$\frac{150 \times 100}{850} = \frac{300}{17} = 17 \frac{11}{17} \%$$

126. (3) Group A = 40%

$$\text{Group B} = \frac{60 \times 75}{100} = 45\%$$

$$\text{Group C} = 15\%$$

If the total number of students be x , then

$$\frac{x \times 15}{100} = 12$$

$$\Rightarrow x = \frac{12 \times 100}{15} = 80$$

127. (3) Speed of first train = $\frac{150}{15}$

$$= 10 \text{ m/sec.}$$

Case II,

$$\text{Time} = \frac{\text{Length of both trains}}{\text{Relative speed}}$$

$$12 = \frac{2 \times 150}{10 + x}$$

Where speed of second train

$$= x \text{ m/sec.}$$

$$\Rightarrow 120 + 12x = 300$$

$$\Rightarrow 12x = 300 - 120 = 180$$

$$\Rightarrow x = \frac{180}{12} = 15 \text{ m/sec.}$$

$$= \frac{15 \times 18}{5} = 54 \text{ km/h.}$$

128. (1) Speed in still water

$$= x \text{ km/h}$$

Speed of current = $y \text{ km/h}$

$$\therefore x + y = \frac{1}{\frac{4}{60}} = 15$$

$$x - y = \frac{1}{\frac{10}{60}} = 6$$

\therefore Speed of current

$$= \frac{1}{2}[(x + y) - (x - y)]$$

$$= \frac{1}{2}(15 - 6) = \frac{9}{2} = 4.5 \text{ km/h}$$

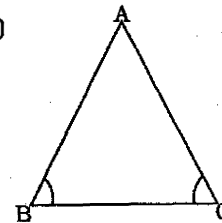
129. (4) Principal = Rs. x = intrest

$$\therefore \text{Rate} = \frac{\text{SI} \times 100}{\text{Principal} \times \text{Time}}$$

$$= \frac{100}{15} = \frac{20}{3}$$

$$= 6 \frac{2}{3} \% \text{ per annum}$$

130. (3)



$$\angle B = \angle C$$

$$\therefore \angle A = 2(\angle B + \angle C)$$

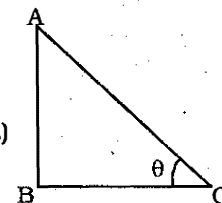
$$\Rightarrow \angle A = 4\angle C$$

$$\therefore 4\angle C + \angle C + \angle C = 180^\circ$$

$$\Rightarrow 6\angle C = 180^\circ$$

$$\Rightarrow \angle C = 30^\circ$$

131. (2)



$$\angle ACB = \theta$$

$$AB = \text{Pole} = x \text{ units}$$

$$BC = \text{Shadow} = \sqrt{3} x \text{ units}$$

$$\therefore \tan \theta = \frac{AB}{BC}$$

$$= \frac{x}{\sqrt{3}x} = \frac{1}{\sqrt{3}}$$

$$\therefore \tan \theta = \tan 30^\circ$$

$$\Rightarrow \theta = 30^\circ$$

$$\begin{aligned} 132. (2) \quad & 3(\sec^2 \theta + \tan^2 \theta) = 5 \\ \Rightarrow & 3(1 + \tan^2 \theta + \tan^2 \theta) = 5 \\ \Rightarrow & 3 + 6 \tan^2 \theta = 5 \\ \Rightarrow & 6 \tan^2 \theta = 5 - 3 = 2 \end{aligned}$$

$$\Rightarrow \tan^2 \theta = \frac{2}{6} = \frac{1}{3}$$

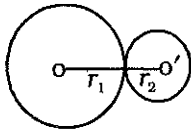
$$\therefore \tan \theta = \frac{1}{\sqrt{3}} = \tan 30^\circ$$

$$\Rightarrow \theta = 30^\circ$$

$$\cos 2\theta = \cos 60^\circ = \frac{1}{2}$$

$$\sin \theta = \sin 30^\circ = \frac{1}{2}$$

133. (2)



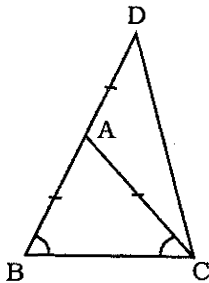
$$OO' = 7$$

$$\Rightarrow r_1 + r_2 = 7$$

$$\Rightarrow 4 + r_2 = 7$$

$$\Rightarrow r_2 = 7 - 4 = 3 \text{ cm}$$

134. (4)



$$\angle ABC = \angle ACB = x$$

$$\therefore \angle BAC = 180^\circ - 2x$$

$$\angle CAD = 180^\circ - 2x$$

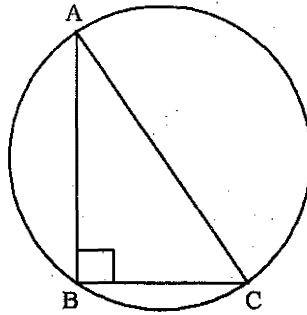
$$\therefore \angle BAD = 180^\circ$$

$$\therefore 180^\circ = (180^\circ - 2x) \times 2$$

$$\Rightarrow 180^\circ - 2x = 90^\circ$$

$$\Rightarrow 2x = 90^\circ = \angle BCD$$

135. (3)



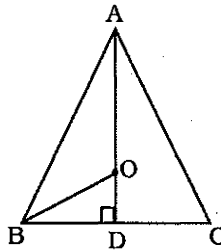
AC = Diameter of circum circle

$$= \sqrt{5^2 + 12^2} = 13 \text{ cm}$$

$$\therefore \text{Circum-radius} = \frac{13}{2}$$

$$= 6.5 \text{ cm}$$

136. (4)



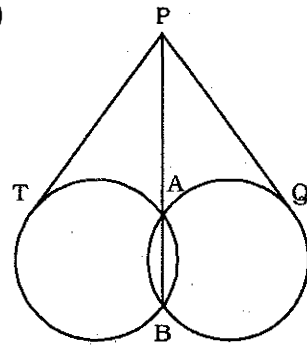
Circum-radius of equilateral

$$\text{triangle} = \frac{2}{3} \times \text{height}$$

$$\therefore 8 = \frac{2}{3} \times \text{height}$$

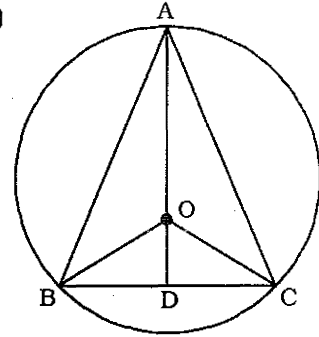
$$\therefore \text{Height} = \frac{8 \times 3}{2} = 12 \text{ cm.}$$

137. (4)



Tangents will be equal.

138. (1)



$$\angle BOC = 2 \angle BAC$$

$$\therefore \angle BOD = \frac{1}{2} \angle BOC$$

$$= \angle BAC$$

139. (4)

$$\frac{1}{1 + \cot^2 \theta} + \frac{3}{1 + \tan^2 \theta} + 2 \sin^2 \theta$$

$$= \frac{1}{\operatorname{cosec}^2 \theta} + \frac{3}{\sec^2 \theta} + 2 \sin^2 \theta$$

$$= \sin^2 \theta + 3 \cos^2 \theta + 2 \sin^2 \theta$$

$$= 3(\sin^2 \theta + \cos^2 \theta)$$

$$= 3$$

140. (1)

$$\frac{4}{1 + \tan^2 \alpha} + \frac{1}{1 + \cot^2 \alpha} + 3 \sin^2 \alpha$$

$$= \frac{4}{\sec^2 \alpha} + \frac{1}{\operatorname{cosec}^2 \alpha} + 3 \sin^2 \alpha$$

$$= 4 \cos^2 \alpha + \sin^2 \alpha + 3 \sin^2 \alpha$$

$$= 4(\cos^2 \alpha + \sin^2 \alpha)$$

$$= 4$$

141. (4) $3(\sin x - \cos x)^4 + 6(\sin x + \cos x)^2 + 4(\sin^6 x + \cos^6 x)$

$$\begin{aligned} &= 3(\sin^2 x + \cos^2 x - 2 \sin x \cdot \cos x)^2 + 6(\sin^2 x + \cos^2 x + 2 \sin x \cdot \cos x) + 4[(\sin^2 x + \cos^2 x)^3 - 3 \sin^2 x \cdot \cos^2 x(\sin^2 x + \cos^2 x)] \\ &= 3(1 - 2 \sin x \cos x)^2 + 6(1 + 2 \sin x \cdot \cos x) + 4(1 - 3 \sin^2 x \cos^2 x) \end{aligned}$$

$$= 3(1 + \sin^2 x \cdot \cos^2 x - 4 \sin x \cos x) + 6(1 + 2 \sin x \cos x) + 4(1 - 3 \sin^2 x \cos^2 x)$$

$$= 3 + 6 + 4 = 13$$

142. (3) Expression

$$= \sec \theta \left(\frac{1 + \sin \theta}{\cos \theta} + \frac{\cos \theta}{1 + \sin \theta} \right) - 2 \tan^2 \theta$$

$$= \frac{1 + \sin^2 \theta + 2 \sin \theta + \cos^2 \theta}{\cos^2 \theta (1 + \sin \theta)} - 2 \tan^2 \theta$$

$$= \frac{2 + 2 \sin \theta}{\cos^2 \theta (1 + \sin \theta)} - 2 \tan^2 \theta$$

$$= \frac{2}{\cos^2 \theta} - 2 \tan^2 \theta$$

$$= 2 \sec^2 \theta - 2 \tan^2 \theta$$

$$= 2(\sec^2 \theta - \tan^2 \theta)$$

$$= 2$$

143. (4) $\sin \theta + \operatorname{cosec} \theta = 2$

$$\sin \theta + \frac{1}{\sin \theta} = 2$$

$$\Rightarrow \frac{\sin^2 \theta + 1}{\sin \theta} = 2$$

$$\Rightarrow \sin^2 \theta - 2 \sin \theta + 1 = 0$$

$$\Rightarrow (\sin \theta - 1)^2 = 0$$

$$\Rightarrow \sin \theta - 1 = 0$$

$$\Rightarrow \sin \theta = 1$$

$$\Rightarrow \operatorname{cosec} \theta = 1$$

$$\therefore \sin^5 \theta + \operatorname{cosec}^5 \theta = 1 + 1 = 2$$

144. (1) Required percentage in-

$$\text{crease} = \frac{1000 - 400}{400} \times 100$$

$$= \frac{600}{4} = 150\%$$

145. (1) Required percentage decrease

$$= \frac{900 - 800}{900} \times 100$$

$$= \frac{100}{9} = 11\frac{1}{9}\%$$

146. (1) Percentage increase :

$$\text{Year 2007 - 2008} \Rightarrow$$

$$\frac{200}{1000} \times 100 = 20\%$$

$$\text{Year 2006 - 2007} \Rightarrow$$

$$\frac{200}{800} \times 100 = 25\%$$

147. (4) Required percentage in-

$$\text{crease} = \frac{1200 - 600}{1200} \times 100$$

$$= 100\%$$

148. (3) Required ratio = 30 : 45

$$= 2 : 3$$

149. (2) Hindus + Muslims

$$= \frac{500000 \times 55}{100} = 275000$$

150. (4) Hindus = $\frac{5000000 \times 35}{100}$
= 1750000

151. (1) Here, it is an error of missing subject. Hence, It being a holiday should be used.

152. (2) **Wonder about** = to think about something and try to decide what is true, what will happen.

Wander = (of minds or thoughts) to stop being directed on something.

153. (1) Each part of connective 'not only.....but also' agrees with same part of speech. Hence, He is not only anxious should be used.

155. (3) For two persons or things, between is used. Hence, to divide it between them/themselves should be used.

156. (3) **Negligible (Adjective)** = of very little importance or size and not worth considering ; insignificant.

157. (2) As....as is an adverb. It is used for comparing two persons or things.

He does not play as well as his sister.

158. (3) **Flee (verb)** = to leave a person or place.

Flee \Rightarrow fled (Past) \Rightarrow fled (Past Participle).

161. (1) The word **Hallucination (Noun)** means : the fact of seeming to see or hear somebody/something that is not really there ; a false belief ; delusion.

Look at the sentence :

High temperatures can cause hallucination.

162. (4) The word **Salacious (Adjective)** means : encouraging sexual desire or containing too much sexual detail ; lustful.

163. (4) The word **Derive (Verb)** means : to obtain a substance from something ; to develop from something.

Look at the sentence :

The new drug is derived from fish oil.

164. (4) The word **Retrench (Verb)** means : reduce ; delete ; remove ; to tell something that they can not continue working for you.

Recruit = to find new people to join an organisation.

165. (4) The word **Aggravate (Verb)** means : worsen, to make an unpleasant situation worse.

The word **Alleviate (Verb)** means : to make something less severe ; ease.

Look at the sentences :

A number of measures were taken to alleviate the problem. Pollution can aggravate asthma.

166. (4) The word **Indelible (Adjective)** means : impossible to forget or remove ; permanent. The word **Temporary (Adjective)** means : lasting for a short time ; not permanent.

Look at the sentences :

The experience made an indelible impression on me.

I am looking for some temporary work.

167. (4) **A live-wire** = a person who is lively and full of energy.

168. (1) **Cool your heels** = to have to wait for somebody/something.

169. (2) **Bury the hatchet/bury your differences** = to stop being unfriendly and become friends again ; make peace.

171. (4) Through thick and thin = even when there are difficulties or problems.

172. (1) Hence, Nouns should be used with as well as. Infinitive without 'to' is used with 'should'.

173. (2) Double comparatives should not be used.

175. (2) Here, pronoun should follow the connective.

176. (1) For place, relative pronoun 'where' should be used.

177. (2) Here, subject (photos) is plural.

180. (3) Active voice should be used.

181. (2) Verb should be used.