

GENERAL INTELLIGENCE

Directions (1-9) : In each of the following questions, select the related word/letters/number from the given alternatives.

1. 4845 : 45² :: 5964 : ?
(a) 59² (b) 94²
(c) 96² (d) 54²
2. RORRIM : MIRROR :: TNESERP : ?
(1) TNERESP (2) PRESENT
(3) CRESENT (4) STNERPE
3. EAC : KGI :: HDF : ?
(1) PLN (2) KIJ
(3) FBD (4) NJL
4. BUT : TUB :: NET : ?
(1) TEN (2) PET
(3) LET (4) TWO
5. 12593 : 35291
29684 : 46982
72936 : ?
(1) 62793 (2) 92637
(3) 69237 (4) 62973
6. 6 : 18 :: 4 : ?
(1) 15 (2) 6
(3) 8 (4) 2
7. Fan : Wings :: Wheel : ?
(1) Cars (2) Air
(3) Spokes (4) Round
8. Mathematics : Logic :: Science : ?
(1) Experiments
(2) Laboratory
(3) Scientists
(4) Facts
9. Window : Pane :: Book : ?
(1) Cover (2) Novel
(3) Page (4) Glass

Directions (10-14) : 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.

10. T, R, P, N, ?
(1) V (2) M
(3) L (4) E
11. 1, 48, 4, 24 7, 2, 10, 2
(1) 8 (2) 2
(3) 18 (4) 12
12. 4, 2, 19, 39, 79, 159
(1) 10 (2) 8
(3) 12 (4) 9
13. 16, 30, 2, 79, 114
(1) 45 (2) 49
(3) 63 (4) 51
14. Z, X, V, T, R, 2, N
(1) P (2) Q
(3) S (4) O
15. In a certain code language PRAYER is coded as MOXV-BO, then how SALUTE will be coded in the same language ?
(1) PXIRQB (2) PXIQRB
(3) PIXQRB (4) PIXRQB
16. If \times stands for \div , \div stands for $+$, $+$ stands for $-$, and $-$ stands for \times , then what is the value of $(30 + 20) - 5(7 \div 3) \times 25 = ?$
(1) 100 (2) 10
(3) 20 (4) 25

Directions (17-25) : In each of the following questions, find the odd word/letters/number from the given alternatives.

17. (1) 51530 (2) 41220
(3) 2610 (4) 3915
18. (1) Gujarat
(2) Maharashtra
(3) Karnataka
(4) Arunachal Pradesh
19. (1) 65 (2) 126
(3) 28 (4) 215
20. (1) 166 (2) 131
(3) 137 (4) 163
21. (1) CGFJ (2) EIHL
(3) GKIN (4) IMNR
22. (1) Water : Tap
(2) Oxygen : Life

- (3) Power : Machine
(4) Oil : Lamp

23. (1) LMVW (2) RQCB
(3) HIXY (4) NODE
24. (1) BDF (2) RTV
(3) XYZ (4) MOQ
25. (1) Chlorophyll
(2) Glucose
(3) Nitrogen
(4) Photosynthesis

26. 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 two matrices given below. The columns and rows of Matrix I are numbered from 0 to 4 and that of Matrix II are numbered from 5 to 9. A letter from these matrices can be represented first by its row and next by its column, e.g., 'B' can be represented by 00,23 etc., and 'P' can be represented by 56,65 etc. Similarly, you have to identify the set for the word 'DEBRIS'

MATRIX-I

	0	1	2	3	4
0	B	U	I	L	D
1	U	I	L	D	B
2	I	L	D	B	U
3	L	D	B	U	I
4	D	B	U	I	L

MATRIX-II

	5	6	7	8	9
5	S	P	A	R	E
6	P	A	R	E	S
7	A	R	E	S	P
8	R	E	S	P	A
9	E	S	P	A	R

- (1) 40, 95, 14, 59, 30, 69
 (2) 22, 59, 42, 59, 34, 69
 (3) 40, 95, 14, 58, 34, 69
 (4) 22, 95, 59, 30, 14, 69

Directions (27-29) : In each of the following questions, arrange the following words as per order in the dictionary.

27. 1. Launderette
 2. Laughter
 3. Laundry
 4. Launch
 (1) 4, 1, 2, 3 (2) 1, 3, 2, 4
 (3) 4, 2, 1, 3 (4) 2, 4, 1, 3
28. 1. Complicate
 2. Complicity
 3. Complication
 4. Compliant
 (1) 2, 1, 3, 4 (2) 4, 2, 3, 1
 (3) 4, 1, 3, 2 (4) 4, 2, 1, 3
29. 1. Extortioner
 2. Extemporize
 3. Extinction
 4. Extermination
 5. Extinguisher
 (1) 2, 4, 5, 3, 1
 (2) 4, 5, 2, 1, 3
 (3) 1, 2, 3, 4, 5
 (4) 2, 4, 3, 5, 1

Directions (30-31) : 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.

30. POLYTHEISM
 (1) HOTELS (2) SMITH
 (3) PISTOL (4) THESIS
31. EMANCIPATE
 (1) PAINT (2) MANIAC
 (3) MENACE (4) PATENT

32. If + means \div , \div means -, - means \times , \times means +, then $12 - 8 \times 6 - 4 \div 6 + 3 = ?$
 (1) -112 (2) +118
 (3) -33 (4) +92

33. Raheja started from a point. He walked 3km to the North, then turned East and walked 4km, then turned West walked 2km and then turned

West walked 3km and stopped. In which direction is Raheja from his starting point ?

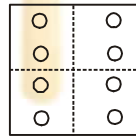
- (1) East (2) South
 (3) North (4) West

34. If 'MOTHER' is coded as 'TOMREH', what should be the code for the word 'NEPHEW' ?

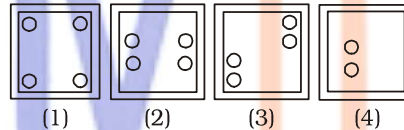
- (1) ENHPWE
 (2) PENWEH
 (3) WEHPEN
 (4) HPENWE

35. If a paper is folded in a particular manner and punch is made, when, unfolded this paper appears as given below in the question figure. Find out the manner in which the paper is folded and the punch is made from the answer figures given.

Question Figure :



Answer Figures :



36. Which one set of letters when sequentially placed at the gaps in the given letter series shall complete it ?

__bcc__aabc__baab__

- (1) acac (2) abcc
 (3) acbc (4) abac

Directions (37-39) : In each of the following questions, select the missing number from the given responses.

37.

5	4	9
6	3	?
7	2	4
65	20	45

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

38.

43	48	41
42	44	?
47	?	?

- (1) 49, 45, 46 (2) 45, 49, 46
 (3) 40, 48, 46 (4) 46, 40, 45

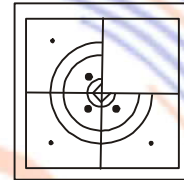
39.

?	6
58	19

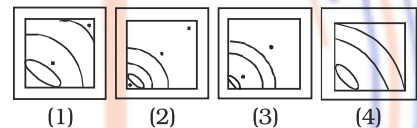
- (1) 175 (2) 147
 (3) 171 (4) 417

40. Which answer figure will complete the pattern in the question figure ?

Question Figure :



Answer Figures :



41. In the following question one statement is given, followed by two Conclusions/Assumptions, I and II. You have to consider the statement to be true even if they seem to be at variance from commonly known facts. You have to decide which of the given Conclusions/Assumptions, if any, follows from the given statements.

Statements :

An advertisement in the paper says "Consume pure organic honey of Company A".

Conclusions :

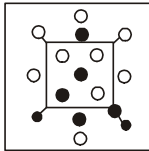
- (I) Artificial honey can be prepared.

(II) People don't mind paying more for pure organically prepared honey.

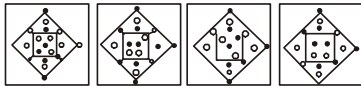
- (1) Assumption II is implicit.
 (2) Both I and II are implicit.
 (3) Neither I nor II is implicit.
 (4) Assumption I is implicit.

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

Question Figure :



Answer Figures :



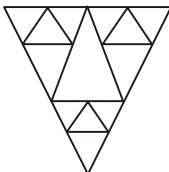
43. Jais and his father has an age difference of 35 years now. After 5 years, the sum of their age is 125. What will be the age of Jais and his father after 12 years from now ?

- (1) 51 and 85
 (2) 52 and 87
 (3) 40 and 75
 (4) 45 and 70

44. After walking 200 metres, I turned right and covered a distance of 100 metres, then turned left and covered a distance of 300 metres. In the end I am facing towards North. From which direction did I start my journey ?

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

45. The number of triangles in the following diagram is :



- (1) 13 (2) 14
 (3) None (4) 17

46. In the following question one statement is given. You have to answer considering the statement to be true, even if it seems to be at variance from commonly known facts.

Statement :

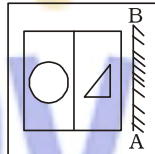
Students go to school in uniforms.

- (1) Students look smart in uniforms.
 (2) Uniforms are compulsory.
 (3) Uniforms are easily available.
 (4) Uniforms create a sense of belongingness.
47. In a certain code 0, 1, 2 9 is coded as a,b,c,....., j then find $baf \div bf \times d$

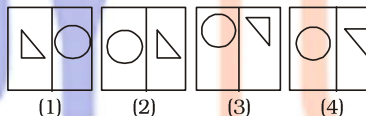
- (1) cb (2) d
 (3) df (4) be

48. If a mirror is placed on the line AB, then which of the answer figures is the right image of the given figure ?

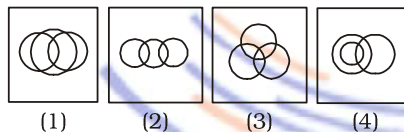
Question Figure :



Answer Figures :



49. Which of the following diagrams best represents cousins, nieces and females ?



50. Adam who is 20 years old is 4 times as old as Mary. What will be Mary's age when Adam is twice as old as her ?

- (1) 35 years
 (2) 15 years
 (3) 30 years
 (4) 17 years

ENGLISH LANGUAGE

Directions (51-54) : In the following questions, sentences are given with blanks to be filled in with an appropriate word(s). Four alternatives are suggested for each question. Choose the correct alternative out of the four as your answer.

51. Ten dollars _____ too much to pay.

- (1) are (2) is
 (3) could (4) were

52. I have no _____ office work.

- (1) experience to
 (2) experience in
 (3) experience on
 (4) experience of

53. Solar panels are used to _____ Satellites.

- (1) powerful
 (2) power
 (3) powerless
 (4) powers

54. His words were _____ for the occasion.

- (1) appropriately
 (2) suit
 (3) appropriate
 (4) suitably

Directions (55 - 58) : 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 your answer. If a sentence is free from error, your answer is **No Error**.

55. She made the child to study hard.

- (1) to study hard
 (2) No Error
 (3) She made
 (4) the child

56. The promise was broken by him.

- (1) was broken
 (2) by him
 (3) The promise
 (4) No Error

57. Rakesh founds the newspaper very dull.
 (1) very dull
 (2) Rakesh founds
 (3) No Error
 (4) the newspaper

58. The door should be keep closed.
 (1) keep closed
 (2) No Error
 (3) should be
 (4) The door

Directions (59 – 62) : In the following questions, out of the four alternatives, choose the word opposite in meaning to the given word as your answer.

59. Ascend
 (1) rise (2) descend
 (3) soar (4) climb
60. Traitor
 (1) migrant (2) member
 (3) patriot (4) officer
61. Detest
 (1) injure (2) assist
 (3) adore (4) withhold
62. Repel
 (1) drag (2) coax
 (3) attract (4) annoy

Directions (63 – 66) : 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 which may improve the sentence. Choose the correct alternative. In case no improvement is needed, your answer is **No Improvement**.

63. It is not difficult to forgive someone who **says sorry**.
 (1) is apologising
 (2) is asking sorry
 (3) No Improvement
 (4) apologises
64. A greedy man always **hankers after** money.
 (1) wanted
 (2) greeds after
 (3) No Improvement
 (4) runs after

65. Ours is a **joined** family.

- (1) joint
 (2) jointed
 (3) No Improvement
 (4) join

66. Be quick **otherwise you would** miss the train.

- (1) otherwise you could have
 (2) No Improvement
 (3) otherwise you will
 (4) otherwise you will have

Directions (67 – 76) : In the following passage some of the words have been left out. Read the passage carefully and choose the correct answer to each question out of the four alternatives and fill in the blanks.

Squirrels are (67) animals in the world. They have the (68) for rainy days. Autumn can be very entertaining for them. That is the time (69) the great harvest collection for their winter store. You can (70) here and there, collecting nuts of all sorts. Walnuts, beech-nuts, chestnuts, dried berries.

They are not fussy. Relentlessly, they run from their storage point, usually a tree hollow, to the vast amount of wild nuts to be found in the forest.

These beautiful animals are house-proud. They take great pains to ensure that (71) and warm enough to tide them over the harsh winter. You (72) busily collecting soft pieces of bark, wood and leaves to line their nests.

After all their (73), and when the first, cold hard frost arrives, they (74) inside their nests for the duration/rest of the cold spell. There, (75) till it is warm enough to bring out their stored food. Ah but then again, they are the most forgetful little animals, and it is not unusual to see squirrels (76) their hoards.

67. (1) the more resource
 (2) this most resourceful
 (3) the most resource
 (4) the most resourceful

68. (1) knack of saving down
 (2) knack of saving on
 (3) knack of saved up
 (4) knack of saving up

69. (1) what they begin
 (2) when they begin
 (3) when their begin
 (4) when them begin

70. (1) see them scampering
 (2) seeing them scampered
 (3) seen them scampering
 (4) see their scampering

71. (1) their nest is secure
 (2) their nest is securing
 (3) they nest is secure
 (4) there nest is secure

72. (1) is saw them
 (2) will seen them
 (3) will saw them
 (4) will see them

73. (1) scavenging is done
 (2) scavenged is done
 (3) scavenged was done
 (4) scavenging is doing

74. (1) will sealing themselves
 (2) will be seal themselves
 (3) will seal themselves
 (4) are seal themselves

75. (1) they will hibernating
 (2) they are hibernated
 (3) them will hibernate
 (4) they will hibernate

76. (1) search desperate at
 (2) searching desperates for
 (3) searching desperately for
 (4) searched desperately for

Directions (77-80) : In the following questions, the first and the last parts of the sentence are numbered 1 and 6. The rest of the sentence is split into four parts and named P, Q, R and S. These four parts are not given in their proper order. Read the sentence and find out which of the four combinations is correct. Then find the correct answer.

77. 1. Margaret Noble
 P. became a disciple
 Q. of Swami Vivekananda
 R. a remarkable Irish lady,
 S. and dedicated her life
 6. to the service of the Indian people.

- (1) SRQP (2) PQRS
(3) SQPR (4) RPQS

78. 1. A man
P. with yellow, red, green
Q. stood holding
R. balloons
S. a pole
6. flying from it.
(1) QRSP (2) PRSQ
(3) QSPR (4) PRQS
79. 1. Earth is the home
P. to our future
Q. we all share
R. generations as their
S. and would pass on
6. legacy.
(1) PRQS (2) QSPR
(3) SPQR (4) QPRS
80. 1. It was a Friday morning
and
P. the lieutenant scanned the
horizon
Q. just as the desert haze
R. with his binoculars
S. was clearing
6. and focused on many ene-
my tanks.
(1) SPQR (2) PRSQ
(3) QSPR (4) RPSQ

Directions (81-82) : In the following two questions, a sentence has been given in Active/Passive Voice. Out of the four alternatives suggested, select the one which best expresses the same sentence in Passive/Active Voice.

81. I was obliged to leave.
(1) Circumstances have obliged me to leave.
(2) Circumstances obliged me to leave.
(3) Circumstance will oblige me to leave.
(4) Circumstance was obliged me to leave.
82. Close the door.
(1) Let the door be closed.
(2) Let the door closed.
(3) Let the door is closed.
(4) Let the door is being closed.

Directions (83-86) : In the following questions, four alternatives are given for the Idiom/Phrase printed in bold. Choose the alternative which best expresses the meaning of the Idiom/Phrase.

83. to be in a quandary

- (1) to be in a confusing situation
(2) to be in an unenviable position
(3) to be on the alert
(4) to be in a commanding position

84. A false friend never hesitates to shed crocodile tears.

- (1) to move from one place to another
(2) to show false happiness
(3) to feel disappointed
(4) to pretend to be sympathetic.

85. Take the bull by the horns
is

- (1) to be helpful
(2) to win the battle
(3) to be sensitive
(4) to face a difficulty courageously

86. Sail in the same boat

- (1) be in the same situation.
(2) suspect something uncanny.
(3) suspect something wrong.
(4) be in a different situation.

Directions (87 - 90) : 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 as your answer.

87. (1) Patritism
(2) Patrotism
(3) Patriotism
(4) Pattriotism

88. (1) Obidient (2) Obediemt
(3) Obedient (4) Obeydient

89. (1) Jewellery (2) Jewellery
(3) Jewelery (4) Jevelry

90. (1) Diffuse (2) Difusse
(3) Diffusse (4) Difuse

Directions (91 - 94) : In the following questions, out of the four alternatives, choose the one which can be substituted for the given words/sentences.

91. A person who worships only one God.
(1) Polytheist
(2) Monotheist
(3) Philogymist
(4) Theist

92. A person who helps another to commit a crime.
(1) Colleague (2) Accomplice
(3) Assistant (4) Supporter

93. A legal agreement that allows someone to use a building or land for a period of time, usually is return for rent.
(1) Assurance (2) Deal
(3) Lease (4) Bond

94. The act of killing one's own brother or sister.
(1) Homicide (2) Suicide
(3) Patricide (4) Fratricide

Directions (95-98) : In the following questions, out of the four alternatives, choose the one which best expresses the meaning of the given word as your answer.

95. Invincible
(1) vulnerable
(2) fallible
(3) yielding
(4) unassailable

96. Result
(1) data (2) decision
(3) outcome (4) cause

97. lousy
(1) awesome
(2) awful
(3) aura (4) awry

98. Crusade
(1) campaign (2) flatten
(3) critical (4) angry

Directions (99 - 100) : In the following questions, a sentence has been given in Direct/Indirect. Out of the four alternatives suggested, select the one which best expresses the same sentence in Direct/Indirect.

99. The men said, "We are going to fly kites."
 (1) The men said that we were going to fly kites.
 (2) The men said that we are going to fly kites.
 (3) The men said that they are going to fly kites.
 (4) The men said that they were going to fly kites.
100. Kumar says, "It doesn't rain in January."
 (1) Kumar says that it doesn't rain in January.
 (2) Kumar says that it didn't rain in January.
 (3) Kumar said that it doesn't rain in January.
 (4) Kumar said that it didn't rain in January.

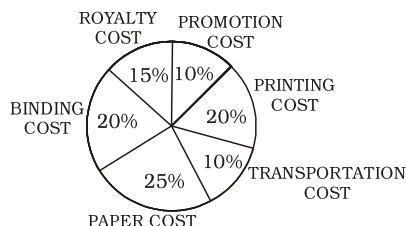
QUANTITATIVE APTITUDE

101. The centroid of an equilateral triangle ABC is G and AB = 10 cm. The length of AG (in cm) is :

- (1) $3\frac{1}{3}$ (2) $\frac{10}{\sqrt{3}}$
 (3) $\frac{10\sqrt{3}}{3}$ (4) $\frac{\sqrt{3}}{3}$

Directions (102-105) : The following pie-chart shows the percentage distribution of the expenditure incurred in publishing a book. Read the pie-chart and answer the questions.

Various Expenditure (in percentage) incurred in publishing a book



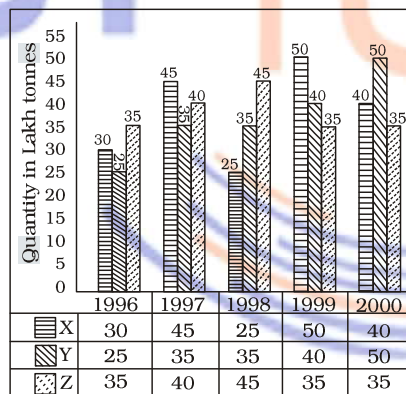
102. Royalty on the book is less than the printing cost by :
 (1) 20% (2) 5%
 (3) 25% (3) $33\frac{1}{3}$

103. The central angle of the sector corresponding to the expenditure incurred on Royalty is :
 (1) 15° (2) 48°
 (3) 54° (4) 24°
104. If 5500 copies are published and the transportation cost on them amount to Rs. 82500 then the selling price of the book so that the publisher can earn a profit of 25% is :
 (1) Rs. 191.50 (2) Rs. 187.50
 (3) Rs. 180 (4) Rs. 175
105. If for a certain quantity of books, the publisher has to pay Rs. 30600 as printing cost, then the amount of royalty cost to be paid for these books is :

- (1) Rs. 21200 (2) Rs. 19450
 (3) Rs. 22950 (4) Rs. 26150

106. A right triangle with sides 9 cm, 12 cm and 15 cm is rotated about the side of 9 cm to form a cone. The volume of the cone so formed is :
 (1) $327\pi\text{ cm}^3$ (2) $330\pi\text{ cm}^3$
 (3) $334\pi\text{ cm}^3$ (4) $324\pi\text{ cm}^3$

Directions (107-111) : The bar graph provided below gives the data of the production of paper (in lakh tonnes) by three different companies X, Y and Z over the years. Study the bar chart and answer the following questions.



107. The percentage of production of company Z to the production of company Y is maximum in :

- (1) 2000 (2) 1996
 (3) 1999 (4) 1998

108. The ratio of the average production of company X in the period 1998-2000 to the average production of company Y in the same period is :
 (1) 27 : 29 (2) 23 : 25
 (3) 25 : 26 (4) 24 : 27

109. The average production for five years is maximum for which company?
 (1) X and Z (2) X
 (3) Z (4) Y

110. The percentage increase in the production of company Y from 1996 to 1999 is :
 (1) 60% (2) 50%
 (3) 55% (4) 40%

111. The difference between the production of company Z in 1998 and company Y in 1996 is :
 (1) 25,00,000 tonnes
 (2) 10,00,000 tonnes
 (3) 15,00,000 tonnes
 (4) 20,00,000 tonnes

112. Volume of a right circular cylinder of height 21 cm and base radius 5 cm is :
 (1) 1255 cm^3
 (2) 1050 cm^3
 (3) 1175 cm^3
 (4) 1650 cm^3

113. The average of 8 numbers is 21. If each of the numbers is multiplied by 8, the average of the new set of numbers is :
 (1) 21 (2) 29
 (3) 8 (4) 168

114. The average of all the odd integers between 2 and 22 is :
 (1) 14 (2) 12
 (3) 13 (4) 11

115. A train is 250m long. If the train takes 50 seconds to cross a tree by the railway line, then the speed of the train in km/hr is :
 (1) 10 (2) 9
 (3) 5 (4) 18

116. The marked price of a CD is Rs. 250. It is sold for Rs. 225. The rate of discount is :

- (1) 2.5% (2) 10%
(3) 25% (4) $11\frac{1}{9}\%$

117. If the Cost Price of 25 chairs is equal to the selling price of 30 chairs, then the loss % is :

- (1) 25% (2) 20%
(3) 5% (4) $16\frac{2}{3}\%$

118. Mr. Dutta desired to deposit his retirement benefit of Rs. 3 lacs partly to a post office and partly to a bank at 10% and 6% interests respectively. If his monthly interest income was Rs. 2000, then the difference of his deposits in the post office and in the bank was :

- (1) Rs. 50,000
(2) Rs. 40,000
(3) Nil
(4) Rs. 1,00,000

119. Ram babu donated 3% of his income to a charity and deposited 12% of the rest in bank. If now he has Rs. 12804, then his income was :

- (1) Rs. 17460
(2) Rs. 15000
(3) Rs. 7500
(4) Rs. 14550

120. The value of the expression $\sin^2 1^\circ + \sin^2 11^\circ + \sin^2 21^\circ + \sin^2 31^\circ + \sin^2 41^\circ + \sin^2 45^\circ + \sin^2 49^\circ + \sin^2 59^\circ + \sin^2 69^\circ + \sin^2 79^\circ + \sin^2 89^\circ$ is :

- (1) 0 (2) $5\frac{1}{2}$
(3) 5 (4) $4\frac{1}{2}$

121. A shopkeeper fixes the price of an article at 30% higher than its actual cost. If he sells it at 10% discount on marked price then, the profit is :

- (1) 18% (2) 19%
(3) 17% (4) 20%

122. If $x = a(\sin \theta + \cos \theta)$ and $y = b(\sin \theta - \cos \theta)$, then the value of $\frac{x^2}{a^2} + \frac{y^2}{b^2}$ is :

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

123. If $x(x+y+z) = 20$, $y(x+y+z) = 30$, and $z(x+y+z) = 50$, then the value of $2(x+y+z)$ is :

- (1) 20 (2) -10
(3) 15 (4) 18

124. AB is a diameter of a circle having centre at O. PQ is a chord which does not intersect AB. Join AP and BQ. If $\angle BAP = \angle ABQ$, then ABQP is a :

- (1) cyclic square
(2) cyclic trapezium
(3) cyclic rhombus
(4) cyclic rectangle

125. A mixture contains milk and water in the ratio 5 : 1. On adding 5 litres of water, the ratio of milk and water becomes 5 : 2. The quantity of milk in the mixture is :

- (1) 25 litres (2) 32.5 litres
(3) 16 litres (4) 22.75 litres

126. The least number that should be subtracted from the number 32146 to make it a perfect square is :

- (1) 305 (2) 105
(3) 205 (4) 405

127. Let $AX \perp BC$ of an equilateral triangle ABC. Then the sum of the perpendicular distances of the sides of $\triangle ABC$ from any point inside the triangle is :

- (1) Equal to BC
(2) Equal to AX
(3) Less than AX
(4) Greater than AX

128. The straight line $y = 3x$ must pass through the point :

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

129. The ratio of two numbers is 3 : 4 and their HCF is 15. Then the sum of the two numbers is :

- (1) 105 (2) 115
(3) 120 (4) 110

130. The average age of mother and her six children is 12 years, which is reduced by 5 years if the age of the mother is excluded. The age of the mother (in years) is :

- (1) 50 (2) 40
(3) 48 (4) 42

131. The liquids, X and Y are mixed in the ratio of 3 : 2 and the mixture is sold at Rs. 11 per litre at a profit of 10%. If the liquid X costs Rs. 2 more per litre than Y, the cost of X per litre is (in Rs.) :

- (1) 10.80 (2) 11.75
(3) 9.50 (4) 11

132. In what proportion must water be added with milk to gain 20% by selling the mixture at cost price?

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

133. If 12 men working 8 hours a day complete the work in 10 days, how long would 16 men

working $7\frac{1}{2}$ hours a day take to complete the same work?

- (1) 7 (2) 6
(3) 10 (4) 8

134. The value of $\frac{1}{1+\sqrt{2}+\sqrt{3}} +$

$\frac{1}{1-\sqrt{2}+\sqrt{3}}$ is :

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

135. If $\cos \theta + \sin \theta = m$ and $\sec \theta + \operatorname{cosec} \theta = n$ then the value of $n(m^2 - 1)$ is equal to :

- (1) 2m (2) mn
(3) 4mn (4) 2n

136. In $\triangle ABC$, the internal bisectors of $\angle B$ and $\angle C$ meet at point O. If $\angle A = 80^\circ$, then $\angle BOC$ is equal to :

- (1) 100° (2) 120°
(3) 130° (4) 140°

137. A motor boat covers a certain distance downstream in a river in 3 hours. It covers the same distance upstream in 3 hours and a half. If the speed of water is 1.5 km/h, then the speed of the boat in still water is :

- (1) 17 km/h (2) 19.5 km/h
(3) 17.5 km/h (4) 19 km/h

138. The three successive angles of a cyclic quadrilateral are in the ratio 1 : 3 : 4, find the measure of the fourth angle?

- (1) 72° (2) 108°
(3) 36° (4) 30°

139. If the radius of a sphere is increased by 2 cm, then its surface area increases by 352 cm^2 . The radius of the sphere initially was :

$$\left(\text{use } \pi = \frac{22}{7} \right)$$

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

140. If $\frac{x - x \tan^2 30^\circ}{1 + \tan^2 30^\circ} = \sin^2 30^\circ + 4 \cot^2 45^\circ - \sec^2 60^\circ$, then the value of x is :

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

141. The sides of a triangle are in the ratio of 7 : 9 : 12. The difference between the lengths of largest and smallest sides is 15 cm. The length of the largest side would be :

- (1) 36 cm (2) 12 cm
(3) 60 cm (4) 24 cm

142. The diameter of a 120 cm long roller is 84 cm. It takes 500 complete revolutions of the

roller to level a ground. The cost of levelling the ground at Rs. 1.50 per sq. m. is :

- (1) Rs. 6000 (2) Rs. 3762
(3) Rs. 2376 (4) Rs. 5750

143. If $5416 * 6$ is a perfect square, then the digit at $*$ is :

- (1) 9 (2) 4
(3) 6 (4) 5

144. If $x + y = 4$, $x^2 + y^2 = 14$ and $x > y$, then the correct value of x and y is :

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

145. If $\cos A + \sin A = \sqrt{2} \cos A$ then $\cos A - \sin A$ is equal to: (where $0^\circ < A < 90^\circ$)

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

146. Find out the wrong number in the sequence :
40960, 10240, 2560, 640, 200, 40, 10

- (1) 2560 (2) 200
(3) 640 (4) 40

147. 150 workers were engaged to finish a piece of work in a certain number of days. Four workers dropped on the second day, four more workers dropped on third day and so on. It takes 8 more days to finish the work now. Find the number of days in which the work was completed?

- (1) 28 (2) 24
(3) 25 (4) 30

148. Mohan purchased a bag with 20 percent discount on the labelled price. He sold it at 40 percent profit on the price he bought. The percentage of profit on the labelled price is :

- (1) 20% (2) 12%
(3) 18% (4) 24%

149. A boy aged 12 years is left with Rs. 100,000 which is un-

der a trust. The trustees invest the money at 6% per annum and pay the minor boy a sum of Rs. 2500, for his pocket money at the end of each year. The expenses of trust come out to be Rs. 500 per annum. Find the amount that will be handed over to the minor boy after he attains the age of 18 years.

- (1) Rs. 120000
(2) Rs. 150000
(3) Rs. 118000
(4) Rs. 125000

150. If $a^2 + b^2 + c^2 = 2(a + b + c) - 3$, then the value of $a + b + c$ is :

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

GENERAL AWARENESS

151. The strongest oxidizing agent among the following is:

- (1) Chlorine (2) Iodine
(3) Fluorine (4) Oxygen

152. Organic food is supposed to be better for human consumption because :

- (1) It is grown in glass house & air tight environment.
(2) It is grown without the use of chemicals & synthetic pesticides.
(3) It depends on chemicals & fertilizers.
(4) It is too expensive to buy.

153. The main component of liquid bleach is:

- (1) Sodium chloride
(2) Sodium hypochlorite
(3) Hydrochloric acid
(4) Sodium hypochlorate

154. Which of the Kushana ruler patronised Buddhism?

- (1) Ashoka
(2) Vikramaditya
(3) Kanishka
(4) Kautilya

155. Commercially valued cork is obtained from :

- (1) Quercus spp

- (2) Cedrus Deodara
(3) Ficus (4) Cycas
- 156.** Which Brigadier was associated with Jallianwala Bagh tragedy?
(1) General Dyer
(2) Arthur Wellesly
(3) General Harris
(4) Colonel Wellesly
- 157.** The oath of office is administered to the Governor by the:
(1) Chief Justice of India
(2) Speaker of Legislative Assembly
(3) President
(4) Chief Justice of High Court
- 158.** Deen Dayal Antyodaya Yojana launched on September 25, 2014 is related to :
(1) Skill development in rural and urban areas
(2) Food security to old age rural people
(3) Poverty alleviation among SC/ST
(4) Women empowerment
- 159.** Unit of resistance is :
(1) $\text{volt}^2 \times \text{ampere}$
(2) $\text{volt}/\text{ampere}$
(3) $\text{ampere}/\text{volt}$
(4) $\text{volt} \times \text{ampere}$
- 160.** What is the superannuation period of Chief Justice of Supreme Court?
(1) 62 years (2) 66 years
(3) 65 years (4) 60 years
- 161.** Who is called as the "Prince of Moneyers"?
(1) Ibrahim Lodhi
(2) Babar
(3) Akbar
(4) Mohammad-Bin-Tughlaq
- 162.** Araneology is the study of:
(1) Rearing of bees
(2) Study of aphids
(3) Study of mites
(4) Study of spiders
- 163.** Which law states that with constant taste and preferences, the proportion of income spend on food stuff diminishes as income increases?
(1) Say's Law
(2) Griffin's Law
(3) Gresham's Law
(4) Engel's Law
- 164.** BOD stands for :
(1) Biological oxidation demand
(2) Biological oxygen demand
(3) Biochemical oxygen demand
(4) Biotic oxidation demand
- 165.** Which of the following is responsible for fostering the development of dance, drama and music in India?
(1) Lalit Kala Akademi
(2) Sangeet Natak Akademi
(3) National School of Drama
(4) Sahitya Akademi
- 166.** Chile saltpeter is the common name of:
(1) Sodium nitrate
(2) Potassium nitrite
(3) Potassium nitrate
(4) Sodium nitrite
- 167.** Who translated 'Mahabharata' into Persian?
(1) Ibn-Batuta
(2) Abul Fazal
(3) Babar
(4) Badauni
- 168.** What do you understand by the term 'Dark Fermentation'?
(1) It is a method to dispose nuclear wastes.
(2) It is a method to produce methane from organic wastes.
(3) It is a method to reduce COD in the atmosphere.
(4) It is a method to produce Hydrogen as a fuel from waste water.
- 169.** In our country the Van Mahotsava day is celebrated on:
(1) 10th August
(2) 1st December
(3) 1st July
(4) 5th October
- 170.** Which of the following states having longest coastline in India?
(1) Andhra Pradesh
(2) Maharashtra
(3) Tamil Nadu
(4) Gujarat
- 171.** Planimeter is used to measure:
(1) Height of a region
(2) Direction
(3) Road Distance
(4) Areas
- 172.** Then term "United Nations" was coined by:
(1) Roosevelt (2) Stalin
(3) Churchill (4) Lenin
- 173.** Which type of switching is used in Internet?
(1) Circuit (2) Telephone
(3) Packet (4) Telex
- 174.** VAT is imposed:
(1) Directly on Consumer
(2) On first stage of production
(3) On final stage of production
(4) On all stages between production and sale
- 175.** Who built 'Adhai Din Ka Jhopra' or 'A hut of two and a half days' at Ajmer?
(1) Qutbuddin Aibak
(2) Balban
(3) Alauddin Khalji
(4) Muhammad-bin-Tughlaq
- 176.** Approximate number of skeletal muscles is :
(1) 500 (2) 700
(3) 200 (4) 206
- 177.** The Ozone layer protects us from:
(1) Cosmic rays
(2) Ultra-Violet rays
(3) Visible rays
(4) Infrared rays
- 178.** International Women's Day is observed on :
(1) 8th March
(2) 3rd March
(3) 27th January
(4) 15th October

- 179.** The term Ecosystem was proposed by:
 (1) Vernadsky
 (2) S.A. Forbes
 (3) A.G. Tansley
 (4) Thienemann
- 180.** Blue Revolution is related to:
 (1) Space research
 (2) Poultry
 (3) Drinking water
 (4) Fisheries
- 181.** The "Recall Provision" to remove the elected office bearers from the local Self Government institution has been executed in :
 (1) Bihar
 (2) Kerala
 (3) Haryana
 (4) Madhya Pradesh
- 182.** Which of the following states is known as the traditional region for Tank Irrigation?
 (1) Assam
 (2) Gujarat
 (3) Tamil Nadu
 (4) Orrisa
- 183.** The first Nobel Prize in Economics was awarded to:
 (1) Stiglitz
 (2) Paul A Samuelson
 (3) Amartya Sen
 (4) Jan Tinbergen and Ragnar Frisch
- 184.** A cycle tyre bursts suddenly. This represents an :
 (1) Isothermal process
 (2) Adiabatic process
 (3) Isochoric process
 (4) Isobaric process
- 185.** Which of the following species are critically endangered?
 (1) Gangetic Dolphin
 (2) Forest Owlet
 (3) White bellied heron
 (4) The gyps Vulture
- 186.** Breaking physical memory into fixed-sized blocs called as:
 (1) Packets (2) Page
 (3) Frames (4) Segments
- 187.** Gas engine was invented by:
 (1) Charles (2) Davy
 (3) Daimler (4) Diesel
- 188.** The highest title in Judo is :
 (1) Black Belt
 (2) 10th Dan
 (3) Yellow Belt
 (4) 12th Dan
- 189.** IMF stands for :
 (1) International Monetary Function
 (2) International Monetary Fund
 (3) Indian Manufacturing Firm
 (4) Interest Minimum Firm Function
- 190.** Which of the following was the early capital of the Rashtrakutas?
 (1) Sopara (2) Ellora
 (3) Vatapi (4) Ajanta
- 191.** Arundhati Roy is the author of the book :
 (1) The Rising Sun
 (2) Truth, Love and a Little Malice
 (3) Half a Life
 (4) The Algebra of Infinite Justice
- 192.** Arboriculture is the study of:
 (1) Cultivation of trees and vegetables
 (2) Art of garden cultivation
 (3) Science of plant life
 (4) Art of growing crops
- 193.** The gas liberated in the Bhopal gas tragedy was:
 (1) Pheynl isocynate
 (2) Acetylene
 (3) Ethylene
 (4) Methyl isocynate
- 194.** The Nobel Peace Prize for 2014 has been awarded to:
 (1) Barack Obama
 (2) Kailash Satyarthi
 (3) Kailash Satyarthi and Malala Yousafzai
 (4) Kailash Satyarthi and Tawakkul Karman
- 195.** Network of a series of vertical and horizontal lines constructed perpendicular to each other is known as:
 (1) Grid system
 (2) Latitudes
 (3) Geographic coordinates
 (4) Longitude
- 196.** Venturimeter is used to measure:
 (1) rate of flow of liquids
 (2) liquid pressure
 (3) surface tension
 (4) liquid density
- 197.** Who is popularly known as the Grand Old Man of India?
 (1) Dadabhai Naoroji
 (2) Madan Mohan Malaviya
 (3) Mahadeva Govinda Ranade
 (4) Surendranath Banerjee
- 198.** 'Origin of Life by Natural Selection' is a book written by:
 (1) Hugo de Veris
 (2) Lamarck
 (3) Charles Darwin
 (4) Charles Dickens
- 199.** Scurvey is caused by:
 (1) Vitamin 'D'
 (2) Vitamin 'A'
 (3) Vitamin 'C'
 (4) Vitamin 'B'
- 200.** Which of the following pairs of physical quantities have the same dimensions?
 (1) Force and Power
 (2) Work and Power
 (3) Work and Energy
 (4) Momentum and Power

ANSWERS

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

EXPLANATIONS

1. (4) 4 8 4 5
 \downarrow \downarrow
 4 5 $\Rightarrow (45)^2$

Similarly,

5 9 6 4
 \downarrow \downarrow
 5 4 $\Rightarrow (54)^2$

2. (2)

R O R R I M \rightarrow M I R R O R

Similarly,

T N E S E R P \rightarrow P R E S E N T

3. (4) E A C \rightarrow K G I
 \downarrow \downarrow \downarrow
 $+6$ $+6$ $+6$

Similarly,

H D F \rightarrow N J L
 \downarrow \downarrow \downarrow
 $+6$ $+6$ $+6$

4. (1)

B U T \rightarrow T U B
 \downarrow \downarrow \downarrow
 $+6$ $+6$ $+6$

Similarly,

N E T \rightarrow T E N
 \downarrow \downarrow \downarrow
 $+6$ $+6$ $+6$

5. (3) A B C D E

1 2 5 9 3

It has been written as :

E C B D A

3 5 2 9 1

2 9 6 8 4 \Rightarrow 4 6 9 8 2

Therefore,

A B C D E

7 2 9 3 6

\Rightarrow E C B D A

6 9 2 3 7

6. (3) 6 : 18

$$\Rightarrow 6 \times \frac{6}{2} = 18$$

Similarly,

4 : ?

$$\Rightarrow 4 \times \frac{4}{2} = 8$$

7. (3) Wings are parts of a fan, Similarly, spokes are parts of a wheel.

8. (1) Mathematics is based on logic. Similarly, experiments are mainstay of the Science.

9. (3) Pane is a part of Window. Similarly, pages are parts of a Book.

10. (3)

T $\xrightarrow{-2}$ R $\xrightarrow{-2}$ P $\xrightarrow{-2}$ N $\xrightarrow{-2}$ L

11. (1) There are two alternating series :

1 4 7 10
 \downarrow \downarrow \downarrow
 $+3$ $+3$ $+3$

48 24 8 2
 \downarrow \downarrow \downarrow
 $\div 2$ $\div 3$ $\div 4$

12. (4) $4 \times 2 + 1 = 9$

$$9 \times 2 + 1 = 19$$

$$19 \times 2 + 1 = 39$$

$$39 \times 2 + 1 = 79$$

$$79 \times 2 + 1 = 159$$

13. (4) $16 + 14 = 30$

$$30 + 21 = 51$$

$$51 + 28 = 79$$

$$79 + 35 = 114$$

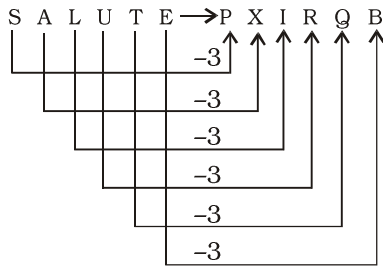
14. (1)

Z $\xrightarrow{-2}$ X $\xrightarrow{-2}$ V $\xrightarrow{-2}$ T $\xrightarrow{-2}$ R $\xrightarrow{-2}$ P $\xrightarrow{-2}$ N

15. (1)

P R A Y E R \rightarrow M O X V B O
 \downarrow \downarrow \downarrow \downarrow \downarrow \downarrow
 -3 -3 -3 -3 -3 -3

Similarly,



16. (3) $\begin{array}{|c|c|} \hline + \Rightarrow \div & \div \Rightarrow + \\ \hline \times \Rightarrow - & - \Rightarrow \times \\ \hline \end{array}$

$$(30 + 20) - 5 (7 \div 3) \times 25 = ?$$

$$\Rightarrow ? = (30 - 20) \times 5 (7 + 3) \div 25$$

$$\Rightarrow ? = 10 \times 5 \times 10 \div 25 = 20$$

17. (4) Except 3915, all others are even numbers.

18. (4) Arunachal Pradesh is a northeastern state of India.

19. (4) Except the number 215, all other numbers are based on :

$$x^3 + 1$$

$$65 = (4)^3 + 1$$

$$126 = (5)^3 + 1$$

$$28 = (3)^3 + 1$$

But,

$$215 = (6)^3 - 1$$

20. (1) Except 166, all others are odd numbers.

21. (3)

$$C \xrightarrow{+4} G \xrightarrow{-1} F \xrightarrow{+4} J$$

$$E \xrightarrow{+4} I \xrightarrow{-1} H \xrightarrow{+4} L$$

$$G \xrightarrow{+4} K \xrightarrow{-2} I \xrightarrow{+5} N$$

$$I \xrightarrow{+4} M \xrightarrow{+1} N \xrightarrow{+4} R$$

22. (1) Except in Water : Tap, in all others the first is necessary for the second to be active.

23. (4)

$$L \xrightarrow{+1} M \xrightarrow{+9} V \xrightarrow{+1} W$$

$$R \xrightarrow{-1} Q \xrightarrow{+12} C \xrightarrow{-1} B$$

$$H \xrightarrow{+1} I \xrightarrow{+15} X \xrightarrow{+1} Y$$

$$N \xrightarrow{+1} O \xrightarrow{-11} D \xrightarrow{+1} E$$

$$24. (3) B \xrightarrow{+2} D \xrightarrow{+2} F$$

$$R \xrightarrow{+2} T \xrightarrow{+2} V$$

$$X \xrightarrow{+1} Y \xrightarrow{+1} Z$$

$$M \xrightarrow{+2} O \xrightarrow{+2} Q$$

25. (4) Photosynthesis is chemical process by which plants make their food in the presence of sunlights and certain constituents.

$$26. (3) D \Rightarrow 04, 13, 22, 31, 40$$

$$E \Rightarrow 59, 68, 77, 86, 95$$

$$B \Rightarrow 00, 14, 23, 32, 41$$

$$R \Rightarrow 58, 67, 76, 85, 99$$

$$I \Rightarrow 02, 11, 20, 34, 43$$

$$S \Rightarrow 55, 69, 78, 87, 96$$

Option	D	E	B	R	I	S
(1)	40	95	14	58	30	69
(2)	22	59	42	59	34	69
(3)	40	95	14	58	34	69
(4)	22	95	59	30	14	69

27. (4) Arrangement of words as per dictionary :

(2) Laughter



(4) Launch



(1) Launderette



(3) Laundry

28. (3) Arrangement of words as per dictionary :

(4) Compliant



(1) Complicate



(3) Complication



(2) Complicity

29. (4) Arrangement of words as per dictionary :

(2) Extemporize



(4) Extermination



(3) Extinction



(5) Extinguisher



(1) Extortioner

30. (4) There is only one 'S' in the given word. Therefore, the word THESIS cannot be formed.

P O L Y T H E I S M

⇒ HOTELS

P O L Y T H E I S M

⇒ SMITH

P O L Y T H E I S M

⇒ PISTOL

31. (4) There is only one 'T' in the given word. Therefore, the word PATENT cannot be formed.

E M A N C I P A T E

⇒ PAINT

E M A N C I P A T E

⇒ MANIAC

E M A N C I P A T E

⇒ MENACE

32. (2) $\begin{array}{|c|c|} \hline + \Rightarrow \div & \div \Rightarrow - \\ \hline - \Rightarrow \times & \times \Rightarrow + \\ \hline \end{array}$

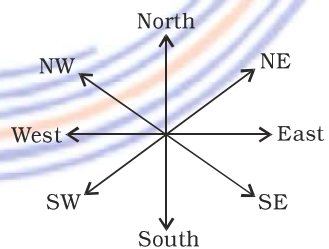
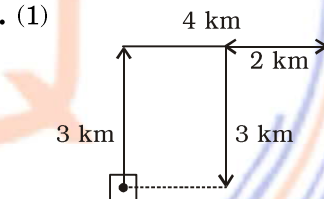
$$12 - 8 \times 6 - 4 \div 6 + 3 = ?$$

$$\Rightarrow ? = 12 \times 8 + 6 \times 4 - 6 \div 3$$

$$\Rightarrow ? = 96 + 24 - 2$$

$$\Rightarrow ? = 120 - 2 = 118$$

33. (1)

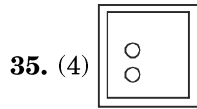


Raheja is to the east of the starting point.

34. (2) $\begin{array}{ccc} M & O & T \\ & \swarrow & \searrow \\ & T & O \\ & \swarrow & \searrow \\ P & E & N \end{array}$ $\begin{array}{ccc} H & E & R \\ & \swarrow & \searrow \\ & R & E \\ & \swarrow & \searrow \\ W & E & H \end{array}$

Therefore,

$\begin{array}{ccc} N & E & P \\ & \swarrow & \searrow \\ & P & E \\ & \swarrow & \searrow \\ P & E & N \end{array}$ $\begin{array}{ccc} H & E & W \\ & \swarrow & \searrow \\ & W & E \\ & \swarrow & \searrow \\ W & E & H \end{array}$



36. (2) $\boxed{a} \boxed{bc/c} \boxed{b} \boxed{a/abc/} \boxed{c} \boxed{ba/}$
 $ab \boxed{c}$

37. (1) First Column
 $(6 + 7) \times 5 = 65$
 Second Column
 $(3 + 2) \times 4 = 20$
 Third Column
 $(4 + ?) \times 9 = 45$

$\Rightarrow 4 + ? = \frac{45}{9}$

$\Rightarrow ? = 5 - 4 = 1$

38. (4) The sum of three numbers in each column and each row is 132

First Column
 $43 + 42 + 47 = 132$

Second Column
 $48 + 44 + ? = 132$

$\Rightarrow ? = 132 - 92 = 40$

First Row
 $43 + 48 + 41 = 132$

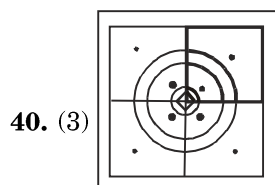
Second Row
 $42 + 44 + ? = 132$

$\Rightarrow ? = 132 - 86 = \boxed{46}$

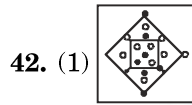
Third Row
 $47 + 40 + ? = 132$

$\Rightarrow ? = 132 - 87 = \boxed{45}$

39. (1) $6 \times 3 + 1 = 19$
 $19 \times 3 + 1 = 58$
 $58 \times 3 + 1 = \boxed{175}$



41. (4) Only assumption I is implicit in the statement. The advertisement advocates the use of pure organic honey. Therefore, it can be assumed that artificial honey can be prepared.



43. (2) Suppose the age of Jais = x years

Therefore, his father's age = $x + 35$ years

According to question

$(x + 5) + (x + 35 + 5) = 135$

$\Rightarrow 2x + 45 = 135$

$\Rightarrow 2x = 135 - 45$

$\therefore x = \frac{90}{2} = 45$

Age of Jais after 12 years

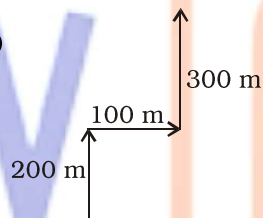
= $x + 12$

= $40 + 12 = 52$ years

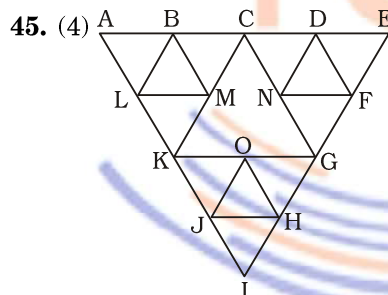
Age of his father after 12 years = $40 + 35 + 12$

= 87 years

44. (4)



I started my journey from south.



The triangles are :

Δ ALB; Δ BLM; Δ BMC; Δ CND;

Δ DNF; Δ DEF; Δ KLM; Δ GNF;

Δ CKG; Δ KJO; Δ OJH; Δ OHG;

Δ JHI; Δ KAC; Δ GCE; Δ IKG;

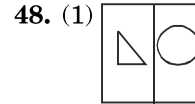
Δ IAE;

46. (4) Clearly, option (4) is the most appropriate.

47. (1) $b \text{ af} \div b \text{ f} \times d$

$\Rightarrow 105 \div 15 \times 3$

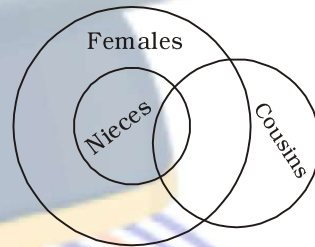
$\Rightarrow 7 \times 3 = 21 \Rightarrow cb$



49. (4) All nieces are females.

Some cousins may be nieces.

Some cousins may be females.



50. (2) Age of Adam = 20 years

Age of Mary = $\frac{20}{4} = 5$ years

After 10 years

Age of Adam = $20 + 10$

= 30 years

Age of Mary = $5 + 10$

= 15 years

51. (2) **Ten dollars** denotes a certain amount of money. Hence, singular verb is should be used here.

52. (4) It is my first experience of living alone.

Look at the sentences :

I have no experience of office work.

53. (2) **Power (Verb)** = to supply a machine with energy.

54. (3) Here, an adjective i.e., appropriate... should be used.

55. (1) Causative verb 'made' agrees with infinitive without to. Hence, study hard... should be used here.

57. (2) Find \Rightarrow found (Past) \Rightarrow found (Past Participle)

Found \Rightarrow founded (Past) \Rightarrow founded (Past Participle).

Look at the sentences :

I found my pen that I had lost yesterday.

Arya Samaj was founded by Dayananda Saraswati.

Hence, Rakesh found... should be used here.

58. (1) Structure of the sentence in passive voice :

Subject + should/would + be + V_3

Hence, kept closed... should be used here.

59. (2) **Ascend (Verb)** = to rise; to go up; to climb up.

Descend (Verb) = to come or go down from a higher to a lower level.

Look at the sentences :

The air became colder as we ascended.

The plane began to descend.

60. (3) **Traitor (Noun)** = a person who gives away secrets about their country; one who betrays; renegade; back-stabber.

Patriot (Noun) = a person who loves their country and is ready to defend against an enemy.

Look at the sentence :

He was seen as a traitor to the socialist cause.

61. (3) **Detest (Verb)** = to hate something very much; loathe.

Adore (Verb) = to love somebody very much.

Look at the sentences :

They detested each other on sight.

I simply adore her music.

62. (3) **Repel (Verb)** = to push, drive, keep something away.

Attract (Verb) = If you are attracted by something; it interests you; arouse interest.

Look at the sentences :

The reptile's prickly skin repels nearly all of its predators.

I had always been attracted by the idea of working abroad.

63. (4) **Apologise** = to say that you are sorry for doing something wrong.

64. (3) **Hanker after** = to have a strong desire for something.

65. (1) Here, joint (Adjective)... should be used.

Joint = involving two or more people together.

66. (3) As the structure suggests, Future Simple... should be used here.

81. (2) Subject + V_2 + Object + infinitive

82. (1) Let + Subject + be + V_3 .

83. (1) **To be in a quandary** = the state of not being able to decide what to do in a difficult situation; in dilemma.

Look at the sentence :

He was in a quandary— should he go or shouldn't he?

84. (4) **Shed crocodile tears** = If somebody sheds crocodile tears, they pretend to be sad about something, but they are not really sad at all.

85. (4) **Take the bull by the horns** = to face a difficult or dangerous situation directly and with courage.

86. (1) **Sail in the same boat** = to be in the same difficult situation.

95. (4) **Invincible (Adjective)** = too strong to be defeated or changed; unconquerable.

Look at the sentence :

The team seemed invincible.

96. (3) **Result (Noun)** = the thing that is caused or produced because of something else; outcome.

Look at the sentence :

The failure of the company was direct result of bad management.

97. (2) **Lousy (Adjective)** = very bad, awful, terrible.

Look at the sentences :

She felt lousy.

What lousy weather!

98. (1) **Crusade (Noun)** = a long and determined effort to achieve something that you believe to be right; campaign.

Look at the sentence :

The new government has started a crusade against corruption.

99. (4) Direct \Rightarrow Indirect

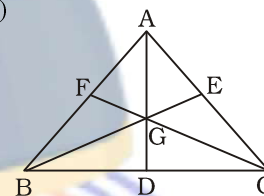
" " \Rightarrow that

we \Rightarrow they

are \Rightarrow were

100. (1) Reporting verb is in present tense. Hence, Tense of Reported speech will not change.

101. (3)



$$BD = DC = 5 \text{ cm}$$

$$\angle ADB = 90^\circ$$

$$\therefore AB^2 = BD^2 + AD^2$$

$$\Rightarrow 10^2 = 5^2 + AD^2$$

$$\Rightarrow 100 = 25 + AD^2$$

$$\Rightarrow AD^2 = 100 - 25 = 75$$

$$\therefore AD = \sqrt{75} = 5\sqrt{3}$$

$$\therefore AG = \frac{2}{3} AD = \frac{2}{3} \times 5\sqrt{3}$$

$$= \frac{10\sqrt{3}}{3} \text{ cm.}$$

102. (3) Required percent

$$= \left(\frac{20-15}{20} \times 100 \right) \%$$

$$= \left(\frac{5}{20} \times 100 \right) \% = 25\%$$

103. (3) Percentage expense on royalty = 15%

$$\therefore 100\% \equiv 360^\circ$$

$$\therefore 15\% \equiv \frac{360}{100} \times 15 = 54^\circ$$

104. (2) Transportation cost = 10%

$$\therefore 10\% \equiv \text{Rs. } 82500$$

$$\therefore 100\% \equiv \text{Rs. } 825000$$

$$\therefore \text{Cost for publishing 1 book}$$

$$= \frac{825000}{5500} = \text{Rs. } 150$$

For a profit of 25%,

$$\therefore \text{Required S.P.} = \frac{150 \times 125}{100}$$

$$= \text{Rs. } 187.50$$

- 105.** (3) Percentage of printing cost = 20%

Percentage of Royalty cost = 15%

$$\therefore 20\% = \text{Rs. } 30600$$

$$\therefore 15\% = \frac{30600}{20} \times 15$$

$$= \text{Rs. } 22950$$

- 106.** (4) Radius of cone so formed = 9 cm

Its height = 12 cm

$$\therefore \text{Volume of cone} = \frac{1}{3} \pi r^2 h$$

$$= \frac{1}{3} \times \pi \times 9 \times 9 \times 12$$

$$= 324 \pi \text{ cu. cm.}$$

- 107.** (2) Percentage of production of company Z to that of company Y :

$$\text{Year 1998} \Rightarrow \frac{45}{35} \times 100$$

$$\approx 129\%$$

$$\text{Year 1996} \Rightarrow \frac{35}{25} \times 100$$

$$= 140\%$$

- 108.** (2) Average production during 1998 – 2000 :

Company X

$$\Rightarrow \left(\frac{25 + 50 + 40}{3} \right) \text{ lakh tonnes}$$

$$= \frac{115}{3} \text{ lakh tonnes}$$

Company Y

$$\Rightarrow \left(\frac{35 + 40 + 50}{3} \right) \text{ lakh tonnes}$$

$$= \frac{125}{3} \text{ lakh tonnes}$$

$$\text{Required ratio} = \frac{115}{3} : \frac{125}{3}$$

$$= 23 : 25$$

- 109.** (1) Average production for 5 years :

Company X

$$\Rightarrow \left(\frac{30 + 45 + 25 + 50 + 40}{5} \right)$$

lakh tonnes

$$\Rightarrow \frac{190}{5} = 38 \text{ lakh tonnes}$$

Company Y

$$\Rightarrow \left(\frac{25 + 35 + 35 + 40 + 50}{5} \right)$$

lakh tonnes

$$= \frac{185}{5} = 37 \text{ lakh tonnes}$$

Company Z

$$\Rightarrow \left(\frac{35 + 40 + 45 + 35 + 35}{5} \right)$$

lakh tonnes

$$= \frac{190}{5} = 38 \text{ lakh tonnes}$$

- 110.** (1) Required percentage increase =

$$\left(\frac{40 - 25}{25} \times 100 \right)$$

$$= \frac{15 \times 100}{25} = 60\%$$

- 111.** (4) Required difference

$$= (45 - 25) \text{ lakh tonnes}$$

$$= 2000000 \text{ tonnes}$$

- 112.** (4) Volume of right circular cylinder = $\pi r^2 h$

$$= \frac{22}{7} \times 5 \times 5 \times 21$$

$$= 1650 \text{ cu. cm.}$$

- 113.** (4) When each number is multiplied by 8, the new average gets multiplied by 8. i.e., $21 \times 8 = 168$

- 114.** (2) Required average

$$= \frac{3 + 5 + 7 + 9 + 11 + 13 + 15 + 17 + 19 + 21}{10}$$

$$= \frac{120}{10} = 12$$

- 115.** (4) Speed of train

$$= \frac{\text{Length of train}}{\text{Time taken in crossing}}$$

$$= \frac{250}{50} = 5 \text{ m/sec.}$$

$$= \left(5 \times \frac{18}{5} \right) \text{ kmph}$$

$$= 18 \text{ kmph}$$

- 116.** (2) Marked price = Rs. 250

$$\text{S.P.} = \text{Rs. } 225$$

$$\text{Discount} = 250 - 225 = \text{Rs. } 25$$

If the rate of discount be $x\%$, then

$$\frac{250 \times x}{100} = 25$$

$$\Rightarrow x = \frac{25 \times 100}{250} = 10\%$$

- 117.** (4) Let the cost of each chair be Re. 1.

$$\therefore \text{C.P. of 30 chairs} = \text{Rs. } 30.$$

$$\text{Their S.P.} = \text{Rs. } 25$$

$$\therefore \text{Loss per cent}$$

$$= \frac{30 - 25}{30} \times 100$$

$$= \frac{50}{3} = 16\frac{2}{3}\%$$

- 118.** (3) Let the amount deposited in Post Office be Rs. x lakhs.

$$\therefore \text{Amount deposited in bank} = \text{Rs. } (3 - x) \text{ lakhs}$$

According to the question,

$$\frac{x \times 10 \times 1}{100 \times 12} + \frac{(3 - x) \times 6 \times 1}{100 \times 12}$$

$$= \frac{2000}{100000} = \frac{1}{50}$$

$$\Rightarrow 10x + 18 - 6x = \frac{1}{50} \times 1200$$

$$= 24$$

$$\Rightarrow 4x = 24 - 18 = 6$$

$$\Rightarrow x = \frac{6}{4} = \text{Rs. } \frac{3}{2} \text{ lakhs}$$

$$\therefore \text{Required difference} = 0$$

- 119.** (2) Let Ram Babu's salary be Rs. x .

Remaining amount after donations to charity

$$= \text{Rs. } \frac{97x}{100}$$

After depositing money in the bank,

Remaining amount

$$= \frac{97x}{100} \times \frac{88}{100}$$

$$\therefore \frac{97x \times 88}{10000} = 12804$$

$$\Rightarrow x = \frac{12804 \times 10000}{97 \times 88}$$

= Rs. 15000

120. (2) $\sin 89^\circ = \sin (90^\circ - 1^\circ)$
 $= \cos 1^\circ$

$$\sin 79^\circ = \sin (90^\circ - 11^\circ)$$

$$= \cos 11^\circ$$

$$\sin 69^\circ = \sin (90^\circ - 21^\circ)$$

$$= \cos 21^\circ$$

$$\sin 59^\circ = \sin (90^\circ - 31^\circ)$$

$$= \cos 31^\circ$$

$$\sin 49^\circ = \sin (90^\circ - 41^\circ)$$

$$= \cos 41^\circ$$

\therefore Expression

$$= (\sin^2 1^\circ + \cos^2 1^\circ) + (\sin^2 11^\circ + \cos^2 11^\circ) + (\sin^2 21^\circ + \cos^2 21^\circ) + (\sin^2 31^\circ + \cos^2 31^\circ) + (\sin^2 41^\circ + \cos^2 41^\circ) + \sin^2 45^\circ$$

$$= 5 + \left(\frac{1}{\sqrt{2}}\right)^2 = 5 + \frac{1}{2} = 5\frac{1}{2}$$

$$[\because \sin^2 \theta + \cos^2 \theta = 1]$$

121. (3) Let the C.P. of article be Rs. 100.

$$\therefore \text{Marked price} = \text{Rs. } 130$$

$$\text{S.P.} = \frac{130 \times 90}{100} = \text{Rs. } 117$$

$$\therefore \text{Profit\%} = 17\%$$

OR

Required profit percent

$$= \left(x + y + \frac{xy}{100}\right)\%$$

$$= \left(30 - 10 - \frac{30 \times 10}{100}\right)\% = 17\%$$

122. (4) $x = a (\sin \theta + \cos \theta)$

$$\Rightarrow \frac{x}{a} = \sin \theta + \cos \theta$$

$$\text{and, } y = b (\sin \theta - \cos \theta)$$

$$\Rightarrow \frac{y}{b} = \sin \theta - \cos \theta$$

$$\therefore \frac{x^2}{a^2} + \frac{y^2}{b^2}$$

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

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

$$[\because (a+b)^2 + (a-b)^2 = 2(a^2 + b^2)]$$

123. (1) $x(x+y+z) = 20$

$$\Rightarrow x^2 + xy + xz = 20 \quad \text{--- (i)}$$

$$\text{Again, } y(x+y+z) = 30$$

$$\Rightarrow xy + y^2 + yz = 30 \quad \text{--- (ii)}$$

$$\text{and, } z(x+y+z) = 50$$

$$\Rightarrow xz + yz + z^2 = 50 \quad \text{--- (iii)}$$

On adding all three equations,

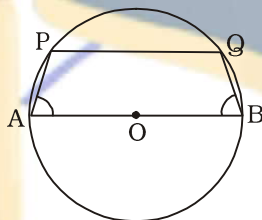
$$x^2 + y^2 + z^2 + 2xy + 2yz + 2zx = 20 + 30 + 50$$

$$\Rightarrow (x+y+z)^2 = 100$$

$$\Rightarrow x+y+z = 10$$

$$\Rightarrow 2(x+y+z) = 20$$

124. (2)



$$\angle PAB = \angle ABQ$$

$$\therefore PQ \parallel AB$$

125. (1) Quantity of milk in the mixture = $5x$ litres

$$\text{Quantity of water} = x \text{ litres}$$

$$\text{According to the question,}$$

$$\text{On adding 5 litres of water,}$$

$$\frac{5x}{x+5} = \frac{5}{2}$$

$$\Rightarrow 10x = 5x + 25$$

$$\Rightarrow 5x = 25 \Rightarrow x = 5$$

$$\therefore \text{Required quantity of milk}$$

$$= 5 \times 5 = 25 \text{ litres}$$

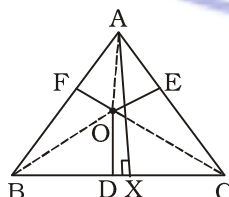
126. (2) $\sqrt{32146} > 179$

$$179 \times 179 = 32041$$

$$\therefore \text{Required answer}$$

$$= 32146 - 32041 = 105$$

127. (2)



Let O be a point inside the triangle.

$$OD \perp BC, OE \perp AC$$

$$\text{and } OF \perp AB$$

$$AB = BC = CA$$

$$\text{Area of } (\Delta OAB + \Delta OBC + \Delta OAC) = \text{Area of } \Delta ABC$$

$$\Rightarrow \frac{1}{2} AB \times OF + \frac{1}{2} BC \times OD$$

$$+ \frac{1}{2} \times AC \times OE$$

$$= \frac{1}{2} \times BC \times AX$$

$$\Rightarrow OF + OD + OE = AX$$

128. (1) $y = 3x$, passes through the origin $(0, 0)$.

129. (1) Let the numbers be $3x$ and $4x$.

$$\text{Their HCF} = x = 15$$

$$\therefore \text{Sum of numbers} = 3x + 4x = 7x = 15 \times 7 = 105$$

130. (4) Mother + 6 children $\Rightarrow 12 \times 7 = 84$ years

$$6 \text{ children} \Rightarrow 6 \times 7 = 42 \text{ years}$$

$$\therefore \text{Mother's age} \Rightarrow 84 - 42$$

$$= 42 \text{ years}$$

131. (1) Let 3 litres of liquid X and 2 litres of liquid Y be mixed together.

$$\text{Cost of liquid Y} = \text{Rs. } x/\text{litre}$$

$$\text{Cost of liquid Y} = \text{Rs. } (x+2)/\text{litre}$$

$$\text{According to the question,}$$

$$\text{Cost of the mixture}$$

$$= \text{Rs. } (3x + 6 + 2x) = \text{Rs. } (5x + 6)$$

$$\therefore (5x + 6) \times \frac{110}{100} = 11 \times 5$$

$$\Rightarrow 5x + 6 = \frac{11 \times 5 \times 10}{11} = 50$$

$$\Rightarrow 5x = 50 - 6 = 44$$

$$\Rightarrow x = \frac{44}{5} = \text{Rs. } 8.8$$

$$\therefore \text{Cost of liquid X} = 8.8 + 2$$

$$= \text{Rs. } 10.8/\text{litre}$$

132. (1) If the cost of milk be Rs. 100, then S.P. = Rs. 120

$$\therefore \text{Required ratio} = 20 : 100 = 1 : 5$$

133. (4)

Men	Working hours	Days
12↑ 16↑	8↑ 7½↑	10↓ x↓

$$\therefore \left. \begin{array}{l} 16 : 12 \\ 15 : 8 \end{array} \right\} :: 10 : x$$

$$\Rightarrow 16 \times \frac{15}{2} \times x = 12 \times 8 \times 10$$

$$\Rightarrow 8 \times 15 \times x = 12 \times 8 \times 10$$

$$\Rightarrow x = \frac{12 \times 8 \times 10}{8 \times 15} = 8 \text{ days}$$

134. (3) Expression

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

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

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

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

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

135. (1) $\cos \theta + \sin \theta = m$ --- (i)

$$\sec \theta + \operatorname{cosec} \theta = n$$

$$\Rightarrow \frac{1}{\cos \theta} + \frac{1}{\sin \theta} = n$$

$$\Rightarrow \frac{\sin \theta + \cos \theta}{\sin \theta \cdot \cos \theta} = n \quad \text{--- (ii)}$$

$$\therefore n(m^2 - 1) = \frac{\sin \theta + \cos \theta}{\sin \theta \cdot \cos \theta}$$

$$[(\sin \theta + \cos \theta)^2 - 1]$$

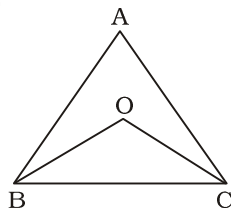
$$= \frac{\sin \theta + \cos \theta}{\sin \theta \cdot \cos \theta} (\sin^2 \theta + \cos^2 \theta + 2\sin \theta \cos \theta - 1)$$

$$= \frac{\sin \theta + \cos \theta}{\sin \theta \cdot \cos \theta} \times 2\sin \theta \cdot \cos \theta$$

$$[\because \sin^2 \theta + \cos^2 \theta = 1]$$

$$= 2(\sin \theta + \cos \theta) = 2m$$

136. (3)



$$\angle OBC = \frac{1}{2} \angle ABC$$

$$\angle OCB = \frac{1}{2} \angle ACB$$

$$\therefore \angle OBC + \angle OCB$$

$$= \frac{1}{2} (\angle ABC + \angle ACB)$$

$$= \frac{1}{2} (180^\circ - \angle BAC)$$

$$= \frac{1}{2} (180^\circ - 80^\circ)$$

$$= \frac{100^\circ}{2} = 50^\circ$$

$$\therefore \text{In } \triangle OBC,$$

$$\angle BOC = 180^\circ - (\angle OBC + \angle OCB)$$

$$= 180^\circ - 50^\circ = 130^\circ$$

137. (2) Let the speed of boat in still water be x kmph and the distance be y km.

$$\therefore \text{Rate downstream}$$

$$= (x + 1.5) \text{ kmph}$$

$$\text{Rate upstream}$$

$$= (x - 1.5) \text{ kmph}$$

According to the question,

$$\frac{y}{x+1.5} = 3 \quad \text{--- (i)}$$

$$\frac{y}{x-1.5} = \frac{7}{2} \quad \text{--- (ii)}$$

On dividing equation (i) by (ii),

$$\frac{x-1.5}{x+1.5} = \frac{3 \times 2}{7} = \frac{6}{7}$$

$$\Rightarrow 7x - 10.5 = 6x + 9$$

$$\Rightarrow x = 10.5 + 9 = 19.5 \text{ kmph.}$$

138. (1) The sum of opposite angles of a concyclic quadrilateral is 180° .

$$\angle A : \angle B : \angle C = 1 : 3 : 4$$

$$\therefore \angle A : \angle C = 1 : 4$$

$$\angle A = \frac{1}{5} \times 180^\circ = 36^\circ$$

$$\angle C = \frac{4}{5} \times 180^\circ = 144^\circ$$

$$\therefore \angle B = 3 \times 36^\circ = 108^\circ$$

$$\therefore \angle D = 180^\circ - 108^\circ = 72^\circ$$

139. (4) Initial radius of sphere = r cm (let).

According to the question,

$$4\pi(r+2)^2 - 4\pi r^2 = 352$$

$$\Rightarrow 4\pi((r+2)^2 - r^2) = 352$$

$$\Rightarrow r^2 + 4r + 4 - r^2 = \frac{352}{4\pi}$$

$$= \frac{352}{4 \times \frac{22}{7}}$$

$$\Rightarrow 4r + 4 = \frac{352 \times 7}{4 \times 22} = 28$$

$$\Rightarrow 4r = 28 - 4 = 24$$

$$\Rightarrow r = \frac{24}{4} = 6 \text{ cm.}$$

140. (3) $\frac{x - x \tan^2 30^\circ}{1 + \tan^2 30^\circ}$
 $= \sin^2 30^\circ + 4 \cot^2 45^\circ - \sec^2 60^\circ$

$$\Rightarrow \frac{x - x \times \left(\frac{1}{\sqrt{3}}\right)^2}{1 + \left(\frac{1}{\sqrt{3}}\right)^2}$$

$$= \left(\frac{1}{2}\right)^2 + 4 \times (1)^2 - (2)^2$$

$$\Rightarrow \frac{x - \frac{x}{3}}{1 + \frac{1}{3}} = \frac{1}{4} + 4 - 4$$

$$\Rightarrow \frac{3x - x}{3 + 1} = \frac{1}{4}$$

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

$$\Rightarrow x = \frac{1}{2}$$

141. (1) Let the sides of the triangle be $7x$, $9x$ and $12x$ cm. According to the question, $12x - 7x = 15$

$$\Rightarrow 5x = 15 \Rightarrow x = \frac{15}{5} = 3$$

$$\therefore \text{Largest side} = 12x = 12 \times 3 = 36 \text{ cm.}$$

142. (3) Levelled area in one revolution of roller = $2\pi rh$

$$= 2 \times \frac{22}{7} \times 42 \times 120$$

$$= 31680 \text{ sq. cm.}$$

Area levelled in 500 revolutions

$$= (31680 \times 500) \text{ sq. cm.}$$

$$= 15840000 \text{ sq. cm.}$$

$$= 1584 \text{ sq. metre}$$

$$\therefore \text{Required cost}$$

$$= \text{Rs. } (1584 \times 1.5)$$

$$= \text{Rs. } 2376$$

$$\begin{array}{r} 143. (1) \quad \begin{array}{r} 7 \overline{) 5416 \cdot 6} \overline{) 736} \\ \underline{143} \\ 103 \\ \underline{7} \\ 36 \\ \underline{28} \\ 8 \\ \underline{7} \\ 1 \end{array} \end{array}$$

$$\therefore 1466 \times 6 = 8796$$

$$\therefore * = 9$$

144. (1) $x + y = 4$ --- (i)

$$x^2 + y^2 = 14$$
 --- (ii)

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

$$\Rightarrow 16 = 14 + 2xy$$

$$\Rightarrow 2xy = 16 - 14 = 2$$

$$\Rightarrow xy = 1$$
 --- (iii)

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

$$= (4)^2 - 4 = 16 - 4 = 12$$

$$\Rightarrow x - y = \sqrt{12} = 2\sqrt{3}$$
 --- (iv)

\therefore On adding equations (i) and (iv)

$$x + y = 4$$

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

$$2x = 4 + 2\sqrt{3}$$

$$\Rightarrow x = 2 + \sqrt{3}$$

From equation (i),

$$2 + \sqrt{3} + y = 4$$

$$\Rightarrow y = 4 - 2 - \sqrt{3} = 2 - \sqrt{3}$$

145. (1) $\cos A + \sin A$

$$= \sqrt{2} \cos A$$
 --- (i)

$$\cos A - \sin A = x \text{ (let)} \text{ --- (ii)}$$

On squaring both equation and adding

$$\begin{aligned} \cos^2 A + \sin^2 A + 2 \sin A \cdot \cos A \\ + \cos^2 A + \sin^2 A - 2 \sin A \cos A \\ = 2 \cos^2 A + x^2 \end{aligned}$$

$$\Rightarrow 2 (\cos^2 A + \sin^2 A)$$

$$= 2 \cos^2 A + x^2$$

$$\Rightarrow x^2 + 2 \cos^2 A = 2$$

$$\Rightarrow x^2 = 2 - 2 \cos^2 A$$

$$= 2 (1 - \cos^2 A) = 2 \sin^2 A$$

$$\therefore x = \sqrt{2} \sin A$$

146. (2) The pattern is :

$$40960 \div 4 = 10240$$

$$10240 \div 4 = 2560$$

$$2560 \div 4 = 640$$

$$640 \div 4 = 160 \neq \boxed{200}$$

$$160 \div 4 = 40$$

$$40 \div 4 = 10$$

147. (3) Let 150 workers complete the work in x days.

$$\therefore 150 \times x = 150 + 146 + \dots \text{ to } (x + 8) \text{ terms}$$

On putting $x = 17$

$$\text{LHS} = 150 \times 17 = 2550$$

$$\text{RHS} = 150 + 146 + \dots \text{ to } 25 \text{ terms}$$

$$a = 150, d = -4, n = 25$$

$$\therefore S = \frac{n}{2} [2a + (n-1)d]$$

$$= \frac{25}{2} [2 \times 150 + 24 \times (-4)]$$

$$= \frac{25}{2} (300 - 96) = \frac{25 \times 204}{2}$$

$$= 2550$$

Note : It is better to solve by options.

148. (2) Let the marked price be Rs. 100.

$$\text{Mohan's C.P.} = \text{Rs. } 80$$

$$\text{Mohan's S.P.} = \frac{80 \times 140}{100}$$

$$= \text{Rs. } 112$$

$$\therefore \text{Required profit percent} = 12\%$$

149. (3) S.I.

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

$$= \frac{100000 \times 6 \times 6}{100}$$

$$= \text{Rs. } 36000$$

Total pocket money

$$= 6 \times 2500 = \text{Rs. } 15000$$

Total expenses of trust

$$= 6 \times 500 = \text{Rs. } 3000$$

Total expenses

$$= \text{Rs. } (15000 + 3000)$$

$$= \text{Rs. } 18000$$

\therefore Amount to be received by the boy

$$= \text{Rs. } (100000 + 36000 - 18000)$$

$$= \text{Rs. } 118000$$

150. (2) $a^2 + b^2 + c^2 = 2(a - b - c) - 3$

$$\Rightarrow a^2 + b^2 + c^2 - 2a + 2b + 2c + 3 = 0$$

$$\Rightarrow a^2 - 2a + 1 + b^2 + 2b + 1 + c^2 + 2c + 1 = 0$$

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

$$\therefore a - 1 = 0 \Rightarrow a = 1$$

$$b + 1 = 0 \Rightarrow b = -1$$

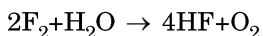
$$c + 1 = 0 \Rightarrow c = -1$$

$$[\text{If } x^2 + y^2 + z^2 = 0 \Rightarrow x = 0, y = 0, z = 0]$$

$$\therefore a + b + c = 1 - 1 - 1 = -1$$

151. (3) An oxidizing agent is a chemical species that removes an electron from another species. Fluorine, having the largest positive value of electrode potential, is the strongest oxidizing agent. As a matter of fact, all halogens have a tendency to take up electrons and thus act as strong oxidizing agents. Among them, Fluorine (the most electronegative element) is given a value of 4.0 and is the strongest oxidizing agent which is reflected in its highly positive standard potential ($E^\circ = +2.85 \text{ V}$). The oxidizing power decreases from fluorine to iodine. Fluorine is

so strong an oxidizing agent that it is impossible to carry out reactions with it in aqueous solution.



- 152.** (2) There are at least two good arguments for eating organic: fewer pesticides and more nutrients. In the absence of pesticides and fertilizers, plants boost their production of the phytochemicals (vitamins and antioxidants) that strengthen their resistance to bugs and weeds. A major new study has found that organic foods contain higher levels of antioxidants and less harmful chemicals than conventionally farmed produce.
- 153.** (2) Sodium hypochlorite bleaches are also called chlorine or liquid household bleach. They are the more powerful laundry bleaches; they are used to whiten and disinfect laundry, is typically either 5.25 percent (regular strength) or 6 percent sodium hypochlorite (ultra strength).
- 154.** (3) Kushana, the most famous Kushana ruler, patronized Buddhism. The Fourth Buddhist Council, in which Buddhism got split into two different schools – Hinayana and Mahayana – was held during his reign in Kashmir. He also patronized the Buddhist scholars – Vasumitra, Asvagosha and Nagarjuna.
- 155.** (1) Cork is a prime-subset of bark tissue that is harvested for commercial use primarily from *Quercus suber*. It is endemic to the Mediterranean region. Cork is composed of suberin, a hydrophobic substance and, because of its impermeable, buoyant, elastic, and fire retardant properties, it is used in a variety of products, such as wine stoppers.

156. (1) The Jallianwala Bagh massacre took place on 13 April 1919 when a crowd of nonviolent protesters who had gathered in Jallianwala Bagh, Amritsar, Punjab were fired upon by troops of the British Indian Army under the command of Colonel Reginald Dyer. Dyer was removed from duty, but he became a celebrated hero in Britain.

157. (4) As per Article 159 of Indian Constitution, the Governor of a state has to take oath in the presence of the Chief Justice of the High court exercising jurisdiction in relation to the State, or, in his absence, the senior most Judge of that Court available. The Governor of a State is appointed by the President.

158. (1) Union Government on 25 September 2014 launched Deen Dayal Upadhyay Antyodaya Yojana for alleviating urban and rural poverty through enhancement of livelihood opportunities through skill development and other means. The Yojana aims at training 10 lakh (1 million) rural youths for jobs in three years, that is, by 2017.

159. (2) An ohm (O) is the SI derived unit of electrical resistance. By definition, a conductor has an electrical resistance of one ohm when a constant potential difference of one volt applied between its ends produces in this conductor a current of one ampere. A volt per ampere (V/A) is the SI derived unit, which is equal to ohm by definition $O = V/A$.

160. (3) Article 124(4) of Constitution of India lays down the procedure for removal of a Judge of Supreme Court which is applicable to Chief Justice as well. Once appointed, the Chief Justice remains

in office until the age of 65 years whichever is earlier.

161. (4) Muhammad-bin-Tughlaq carried out several monetary experiments and has been called a 'Prince of Moneyers'. In 1329-30, he introduced token currency under which copper and brass coins were to have the same value as silver coins. The idea failed as he had done nothing to curb its private and unauthorized issue and thus every house became a mint.

162. (4) Araneology is a branch of zoology that deals with the study of spiders. It is a branch of Arachnology, the scientific study of spiders and related animals such as scorpions, pseudo-scorpions, and harvestmen, collectively called arachnids.

163. (4) According to Engel's Law, as disposable income of a consumer increases, the percentage of income spent for food decreases if all other factors remain constant. This happens even when the actual expenditure on food rises. The income elasticity of demand of food is less than 1. A lower Engel coefficient indicates a higher standard of living.

164. (3) BOD stands for Biochemical Oxygen Demand. It is the amount of dissolved oxygen needed by aerobic biological organisms to break down organic material present in a given water sample at certain temperature over a specific time period. The BOD value is most commonly expressed in milligrams of oxygen consumed per litre of sample during 5 days of incubation at 20°C.

165. (2) The Sangeet Natak Akademi is the apex body of the performing arts in the country to preserve and promote the vast cultural heritage of

- India expressed in music, dance and drama. It was set up by the Indian education ministry on 31 May 1952 and became functional the following year. It is located in New Delhi.
- 166.** (1) Sodium Nitrate (NaNO_3) is also known as Chile saltpeter or Peru saltpeter (due to the large deposits found in the Atacama desert in these countries) to distinguish it from ordinary saltpeter, potassium nitrate. Also known as soda niter, it is used in the production of fertilizers, pyrotechnics and smoke bombs, glass and pottery enamels, food preservatives, and solid rocket propellant
- 167.** (4) The Mahabharata was translated into Persian at Akbar's orders, by Faizi and Abd al-Qadir Badauni and named Razmnama. Razmnama is not an exact translation but a free Persian adaptation, as Badauni states. Badauni translated two of the 18 books. Badauni also translated the Ramayana.
- 168.** (4) Dark fermentation is the fermentative conversion of organic substrate to bio-hydrogen. It is a complex process manifested by diverse groups of bacteria, involving a series of biochemical reactions using three steps similar to anaerobic conversion. Wastewater is used as a potential substrate for bio-hydrogen production in the dark fermentation process.
- 169.** (3) Van Mahotsav or the festival of trees is a festival celebrated in India in the first week of July. This celebration was started in 1950 by Dr. K.M. Munshi the Agriculture minister for India during the same year. As part of the celebrations, millions of saplings are planted by people of all age groups from all over the country in the Van Mahotsav week.
- 170.** (4) Gujarat, in the northwestern region of India, has the longest coastline, covering more than 1,600 km. It accounts for 22% of total coastline of the country. Its coast is bordered by the Arabian Sea and the Gulfs of Khambat and Kachchh. Its coastline nurtures a diversity of habitats, especially mangroves, salt marshes, coral reefs, wetlands, and sea grasses.
- 171.** (4) A planimeter, also known as a platometer, is a measuring instrument used to determine the area of an arbitrary two-dimensional shape. They were once common, but have now largely been replaced by digital tools. The Swiss mathematician Jakob Amsler-Lafon built the first modern planimeter in 1854.
- 172.** (1) The name "United Nations" was coined by United States President Franklin D. Roosevelt. It was first used in the Declaration by United Nations of 1 January 1942, during the Second World War, when representatives of 26 nations pledged their Governments to continue fighting together against the Axis Powers.
- 173.** (3) Packet switching is the dividing of messages into packets before they are sent, transmitting each packet individually, and then reassembling them into the original message once all of them have arrived at the intended destination. Packets are the fundamental unit of information transport in internet that uses the datagram packet switching method. Most modern Wide Area Network protocols, including TCP/IP, are based on packet-switching technologies.
- 174.** (4) Value Added Tax (VAT) is imposed on the value added to each commodity by a firm during all stages of production and distribution. In simple terms, it is a fee assessed against businesses at each step of the production and distribution process, usually whenever a product is resold or value is added to it. Value-added taxation in India was introduced as an indirect value added tax (VAT) into the Indian taxation system from 1 April 2005.
- 175.** (1) Adhai Din ka Jhonpra is an ancient Vaishnava Hindu temple which was constructed during 1153 A.D. and later converted into a mosque in the year 1193 by Qutub-ud-Din Aibak. It is located in the city of Ajmer, Rajasthan, on the mountain slope of Taragarh Hill.
- 176.** (2) There are approximately 640 skeletal muscles within the typical human, and almost every muscle constitutes one part of a pair of identical bilateral muscles, found on both sides, resulting in approximately 320 pairs of muscles. Nevertheless, the exact number is difficult to define because different sources group muscles differently, e.g. regarding what is defined as different parts of a single muscle or as several muscles. Examples range from 640 to 850.
- 177.** (2) The ozone layer refers to a region of Earth's stratosphere that absorbs most of the Sun's ultraviolet (UV) radiation. It absorbs 97–99% of the Sun's medium-frequency ultraviolet light (from about 200 nm to 315 nm wavelength), which otherwise would potentially damage exposed life forms near the surface.

178. (1) International Women's Day is celebrated on March 8 every year. Though the first International Women's Day event was run on 19 March in 1911, for the United Nations, the Day has been observed on 8 March since 1975. The official United Nations theme for International Women's Day 2015 is "Empowering Women - Empowering Humanity: Picture It!"
179. (3) The term "ecosystem" was first coined by Roy Clapham in 1930, but it was ecologist Arthur Tansley who fully defined the ecosystem concept. In his classic article of 1935, Tansley defined ecosystems as "The whole system,... including not only the organism-complex, but also the whole complex of physical factors forming what we call the environment."
180. (2) Blue Revolution means the adoption of a package programme to increase the production of fish and marine products. The Blue Revolution in India was started in 1970 during the Fifth Five-Year Plan when the Central Government sponsored the Fish Farmers Development Agency (FFDA). It is related to fish breeding, fish rearing, fish marketing, and fish export.
181. (4) At present, there is no provision in the Indian Constitution or in the Representation of People's Act 1951 for Recall, that is basically a process whereby the electorate has the power to remove the elected officials before the expiry of their usual term. However, certain states like Madhya Pradesh and Chhattisgarh have executed the provision at the level of local bodies.
182. (3) Given the seasonal and erratic nature of rainfall throughout the year, South India is known to use tank irrigation as time-tested technology for storing rainfall and runoff for a number of uses: crop irrigation, groundwater recharge, domestic use, cattle watering, etc. Tank irrigation currently accounts for more than 30 percent of all irrigated cropland in the state of Tamil Nadu and Karnataka. There exist approximately 39,000 irrigation tanks of various sizes in Tamil Nadu alone.
183. (4) The first Nobel Memorial Prize in Economic Sciences was given in 1969 to Ragnar Frisch (Norway) and Jan Tinbergen (The Netherlands) for "having developed and applied dynamic models for the analysis of economic processes." The award, officially known as The Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel, is awarded annually by the Royal Swedish Academy of Sciences.
184. (2) When a tyre bursts suddenly energy is not immediately transferred between the system and the surrounding. So the process is adiabatic. There sudden expansion of its air into the atmosphere is adiabatic and the tyre is cooled. In adiabatic process, heat neither enters the system nor leaves the system.
185. (2) The Union Ministry of Environment, Forest and Climate Change lists Forest Owlet (*Heteroglaux blewitti*) as one of the "critically endangered species" of India under the bird category. It is found in dry deciduous forest of South Madhya Pradesh, in north-west Maharashtra and north-central Maharashtra. It has been endangered due to logging operations, burning and cutting of trees.
186. (3) The basic method for implementing paging involves breaking physical memory into fixed-sized blocks called frames and breaking logical memory into blocks of the same size called pages. When a process is to be executed, its pages are loaded into any available memory frames from the backing store. The backing store is divided into fixed-sized blocks that are of the same size as the memory frames.
187. (3) Gottlieb Daimler invented the prototype of the modern gasoline engine in 1885. This gas engine was made with a vertical cylinder, and gasoline injected through a carburetor (patented in 1887). Daimler first built a two-wheeled vehicle the "Reitwagen" (Riding Carriage) with this engine and a year later built the world's first four-wheeled motor vehicle.
188. (2) In Judo, improvement and understanding of the art is denoted by a system of ranks split into 'kyu' and 'dan' grades. The final Dan is the twelfth dan, this is usually coloured white along with a judoka's first belt, however the highest dan reached in judo remains 10th dan. Since there has never been any promotion to a rank above 10th dan, the Kodokan Judo promotion system effectively has only 10 dan ranks. There have only been 15 10th dans awarded by the Kodokan in the history of Judo.
189. (2) IMF stands for International Monetary Fund. It is an organization of 188 countries, working to foster global monetary cooperation, secure financial stability, fa-

- cilitate international trade, promote high employment and sustainable economic growth, and reduce poverty around the world. It is headquartered in Washington, D.C, USA.
- 190.** (2) There is uncertainty about the location of the early capital of the Rashtrakutas. However, since most of the Rashtrakuta monuments are found at Ellora (Ilapura), with nothing correspondence at Malkhed (Manyakhet), it has been suggested that the early Rashtrakuta capital was located in the vicinity of the Ellora caves in the time of Dantidurga who was the founder and first ruler of the dynasty. Later, Amoghavarsha I made Manyakhet his capital that remained the Rashtrakutas' regal capital until the end of the empire.
- 191.** (4) The Algebra of Infinite Justice (2001) is a collection of essays written by Booker Prize winner Arundhati Roy. The book discusses several perspectives of global and local concerns, among them one being the abuse of Nuclear bomb showoffs. Published by the Penguin Books India, the book discusses the political euphoria in India over its successful nuclear bomb tests.
- 192.** (1) Arboriculture is the cultivation, management, and study of individual trees, shrubs, vines, vegetables and other perennial woody plants. It is primarily focused on individual woody plants and trees maintained for permanent landscape and amenity purposes, usually in gardens, parks or other populated settings, by arborists, for the enjoyment, protection, and benefit of human beings. It falls under the general umbrella of horticulture.
- 193.** (4) The Bhopal gas tragedy involved the leakage of poisonous methyl isocyanate (MIC) gas and other chemicals at the Union Carbide India Limited (UCIL) pesticide plant in Bhopal, Madhya Pradesh, on the night of 2–3 December 1984. It is considered the world's worst industrial disaster.
- 194.** (3) The 2014 Nobel Peace Prize was shared, in two equal parts, between Kailash Satyarthi and Malala Yousafzai "for their struggle against the suppression of children and young people and for the right of all children to education". Satyarthi became the seventh person from India to win a Nobel Prize, while Yousafzai, the second Nobel Prize winner from Pakistan.
- 195.** (1) A grid is a network or a series of vertical and horizontal lines constructed perpendicular to each other. One series of lines runs from east to west and the other from north to south. Together they form squares of same dimensions within a given map. Each of the line forming the squares is given a value so that the position of an object on a map can be easily identified.
- 196.** (1) A venturi meter is used to measure the flow speed of a fluid in a pipe. It is essentially a short pipe consisting of two conical parts with a short portion of uniform cross-section in between. It is always used in a way that the upstream part of the flow takes place through the short conical portion while the downstream part of the flow through the long one.
- 197.** (1) Dadabhai Naoroji, a Parsi intellectual, educator, cotton trader, and an early Indian political and social leader, is known as the Grand Old Man of India. He is credited with the founding of the Indian National Congress, along with A.O. Hume. His book 'Poverty and Un-British Rule in India' brought attention to the draining of India's wealth into Britain.
- 198.** (3) 'On the Origin of Species,' published on 24 November 1859, is a work of scientific literature by Charles Darwin which is considered to be the foundation of evolutionary biology. Its full title was 'On the Origin of Species by Means of Natural Selection.' It introduced the scientific theory that populations evolve over the course of generations through a process of natural selection.
- 199.** (3) Scurvy is a disease resulting from a deficiency of vitamin C (ascorbic acid). It is sometimes also referred to as Barlow's disease, named after Sir Thomas Barlow, a British physician who described it in 1883. Scurvy can be prevented by consuming enough vitamin C, either in the diet or as a supplement.
- 200.** (3) The term energy is used to describe the capacity of a system to do work on another system. Energy of all types (Surface Tension, Kinetic, Potential etc.) have the same dimension and unit as that of Work. Both energy and work have the same dimensional formula of $M^1L^2T^{-2}$. In the SI system, both have the same units of Newton meter.

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