National Talent Search Examination

NTSE 2018

Paper I : Mental Ability Test (MAT)

Time : 90 Minutes **Max. Marks :** 90

Directions *(Qs. 1-4) In each of the following questions, there is same relationship between the two terms on the left of '::' and the same relationship holds between the two terms to its right. Also, in each question, one term to the right of '::' is missing. This term is given as one of the alternatives below each question. Find out this term from the given alternatives.*

1. NOVA : OVON :: OZON : ?
(a) ZNOO (b) ZOZO (c) ONOZ (d) ZOOZ

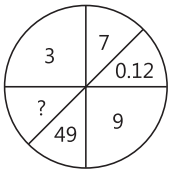
2. BEJQQ : ACGMU :: FINUU : ?
(a) FGKQY (b) EGKQY (c) GKYQE (d) EKGYQ

3. BDGK : OKHF :: KMPT : ?
(a) XTQO (b) XOTQ (c) XUQO (d) YTQO

4. BEFC : EDBF :: VYZW : ?
(a) YXVZ (b) XYVZ (c) YVXZ (d) ZVXV

Directions *(Qs. 5-6) Find out the missing character in the following questions.*

5.



(a) 0.144 (b) 0.0144 (c) 0.00144 (d) 1.44

6.

4	5	8
5	6	?
4	5	8
80	150	448

(a) 10 (b) 8 (c) 7 (d) 6

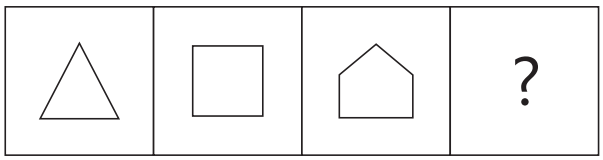
7. Find out the related number
3 7 15 31 : 6 13 8 17 :: 5 11 4 9 : ?
(a) 7 15 8 18 (b) 3 8 6 13
(c) 2 5 5 13 (d) 9 19 39 79

Directions *(Qs. 8-9) In the following questions, find the number which holds the same relation with the third number as there is between the first two numbers.*

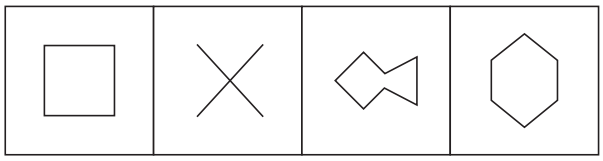
8. 90 : 81 :: 120 : ?
(a) 144 (b) 169 (c) 100 (d) 124

9. 81 : 3 : 27 :: ? : ? : 125
(a) 125, 25 (b) 216, 36 (c) 625, 25 (d) 625, 5

10. Find the next figure in the following figure series
Question Figures



Answer Figures



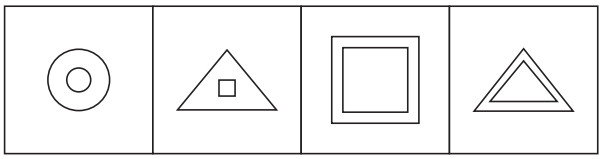
(a) (b) (c) (d)

11. Amit started walking towards North. After walking 100 m, he turned to his right and walked 500 m. He again moved to his right and walked 100 m, he moved to his left and then walked 200 m. He again turned to his right and walked 700m. In the end, he turned to his left two times. How far is he from his original position?
(a) 1200 m (b) 1300 m
(c) 1400 m (d) 1600 m

Directions *(Qs. 12-14) Choose the odd one.*

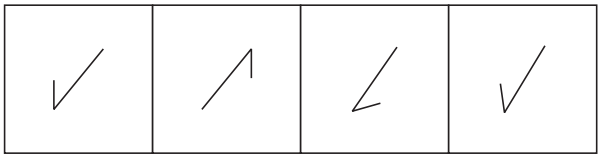
12. (a) 5, 25, 5 (b) 3, 51, 17
(c) 6, 96, 16 (d) 25, 75, 5

13.



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

14.



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

15. In the following number series, how many times the two consecutive numbers have a difference of 4?
2, 8, 3, 5, 1, 2, 7, 8, 6, 4, 3, 7, 3, 9, 8, 5, 1, 7, 3, 4, 5, 1, 2, 7, 3, 4, 6, 5, 1, 6, 5, 1, 8, 7, 2
(a) Six (b) Four (c) Five (d) Seven

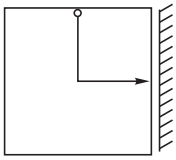
16. In the following number series, how many times number 2 has come before 8 but 3 has not come after 8?
3, 4, 2, 8, 3, 5, 2, 8, 6, 7, 4, 2, 8, 6, 6, 2, 8,
(a) One (b) Three (c) Four (4) Two

17. In the following number series, how many times 6 has come before 8 but 2 has not come after 8?
1, 4, 6, 8, 2, 3, 5, 6, 8, 4, 5, 6, 8, 7, 3, 2, 6, 8, 2, 6, 8, 3, 6, 8
(a) One (b) Two (c) Three (d) Four

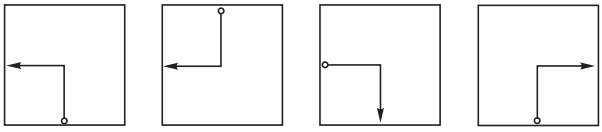
18. In the following number series, how many times (one after another) number in the given sequence are square of the previous number?
3, 6, 2, 3, 9, 1, 5, 6, 36, 81, 9, 8, 64, 12, 25, 38, 5, 25, 6, 34, 2, 4, 5, 23, 4, 16, 2, 5
(a) Four (b) Five (c) Six (d) Seven

19. Choose the correct mirror image of the following question figure

Question Figure



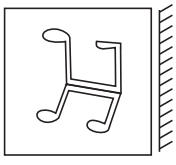
Answer Figures



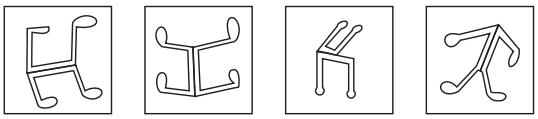
(a) (b) (c) (d)

20. If the following mirror image of question figure is rotated to 90° in anti-clockwise direction, then find the correct answer figure from the given answer figures

Question Figure



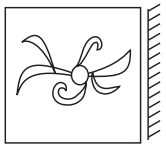
Answer Figures



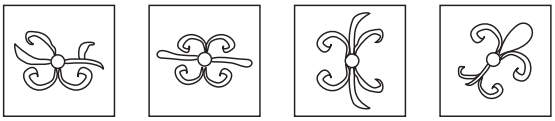
(a) (b) (c) (d)

21. Choose the correct water image of the following question figure

Question Figure



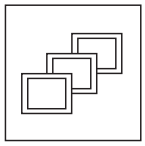
Answer Figures



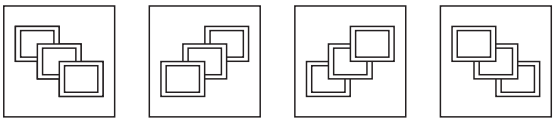
(a) (b) (c) (d)

22. Find out the correct answer figure which will be obtained when question figure is rotated by 90° in clockwise direction. Also find its water image

Question Figure



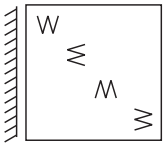
Answer Figures



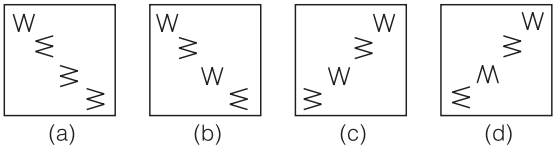
(a) (b) (c) (d)

23. Which answer figure will be the correct mirror image of the question figure?

Question Figure



Answer Figures

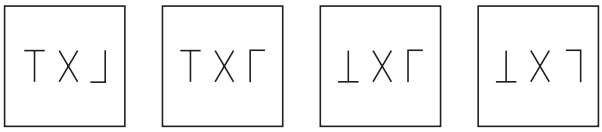


(a) (b) (c) (d)

24. Which answer figure will be the correct water image of the question figure?

Question Figure

Answer Figures



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

25. Gopal is elder by 4 yr to Govind. After 16 yr Gopal will be thrice his present age and Govind will be five times of his present age. How old is Gopal?

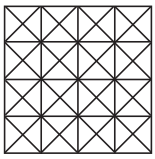
(a) 12 yr (b) 8 yr (c) 10 yr (d) 9 yr

26. If in a particular year, 16th June was friday, then the first friday in July of that year will fall on which date?

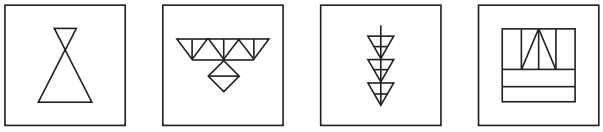
(a) 8th July (b) 5th July (c) 7th July (d) 6th July

27. In which answer figure is the question figure hidden/ embedded?

Question Figure



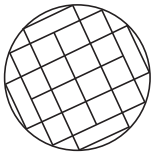
Answer Figures



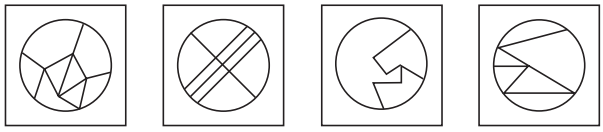
(a) (b) (c) (d)

28. Among the four answer figures which one is not in the question figure?

Question Figure



Answer Figures



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

29. In a row of boys Suresh is 8th from the left and Mukesh is also 8th from the right. When Suresh and Mukesh interchange their positions, Suresh becomes 16th from the left? How many boys are there in the row?

(a) 24 (b) 19 (c) 23 (d) 26

30. If C is husband of B, B is daughter of A, A is mother of D and D is a male, then how D is related to B?

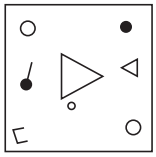
(a) Son (b) Brother (c) Father (d) Husband

31. If C is brother of B, B is son of A, D is father of C and A is a female, then how A is related to D?

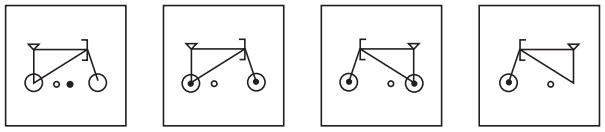
(a) Sister (b) Mother
(c) Father (d) Wife

Directions *(Qs. 32-33) In each of the following questions, find out which of the figures (a), (b), (c) and (d) can be formed from the pieces given in a question figure.*

32. Question Figure

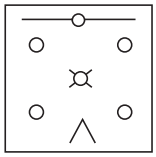


Answer Figures

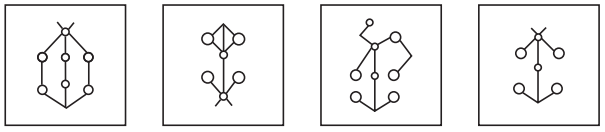


(a) (b) (c) (d)

33. Question Figure



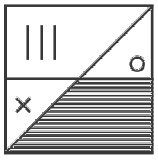
Answer Figures



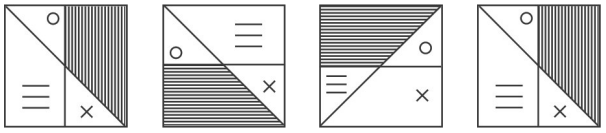
(a) (b) (c) (d)

34. Which of the answer figure can be formed by rotating the question figure at one step anti-clockwise?

Question Figure

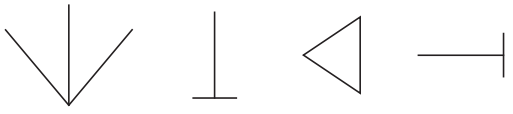


Answer Figures



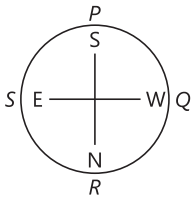
(a) (b) (c) (d)

35. Manish's house is 15 m away in the Northern direction from his office, which is 10 m West of his factory and 10 m East of his club. Which of the given alternatives represents the positions of office, club, house and factory?



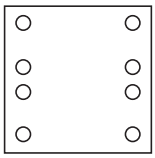
(a) (b) (c) (d)

36. In a given circle directions are given and places of *P, Q, R* and *S* have been shown. If *P* moves one and half quarter clockwise then in which direction *P* will be?

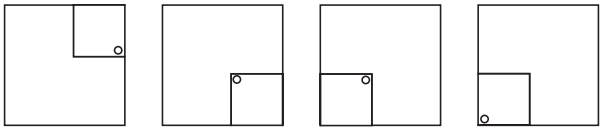


(a) South-West (b) North-West
(c) South-East (d) North-East

37. A square paper is folded in a particular manner and a bunch is made. When unfolded the paper appears as given below
Question Figure



Which of the following answer figures shows the correct manner in which bunch is made?
Answer Figures



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

Directions *(Qs. 38-40) Study the following information and answer the questions.*

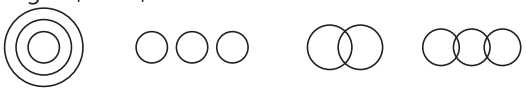
A and D are good in Science and Cricket.
A and C are good in Science and Mathematics.
B and E are good in Tennis and Cricket.
B and C are good in Mathematics and Tennis.
D and E are good in Music and Cricket.

38. Who is good in Cricket, Maths and Science?
(a) A (b) C (c) D (d) B

39. Who is good in Science, Tennis and Maths?
(a) E (b) C (c) B (d) D

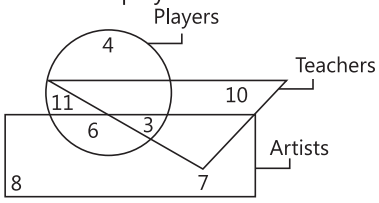
40. Who is not good in Science and Music?
(a) E (b) B (c) A (d) C

41. Which of the following diagrams shows the relationship amongst the three given classes?
English, Latin, Greek



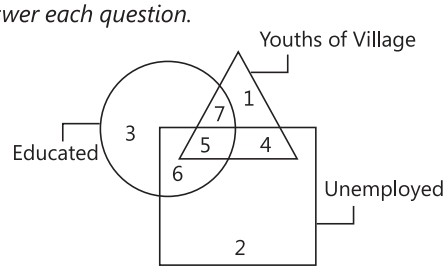
(a) (b) (c) (d)

42. From the figure given below, find out how many teachers are both players and artists?



(a) 3 (b) 6 (c) 11 (d) 10

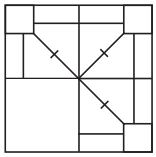
Directions *(Qs. 43-44) Study the following diagram and then answer each question.*



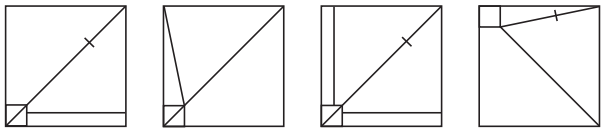
43. Which is the number that represents uneducated and unemployed youths in village?
(a) 4 (b) 7 (c) 5 (d) 6

44. Which is the number that represents educated youths in village?
(a) 12 (b) 4 (c) 7 (d) 8

45. Which answer figure will complete the question figure?
Question Figure



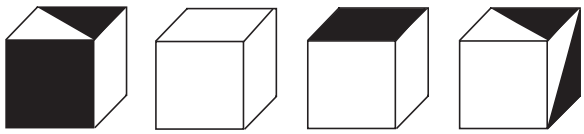
Answer Figures



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

46. How will the figure look like when folded along the lines into a cube?
Question Figure

Answer Figures



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

47. In the following list, alphabets codes for each word have been given written in jumbled form

CRY	DEZ
RAY	XZE
TREE	XEHK
FARE	EXKM
CAT	XDH
FAT	HMX

What will be the code for 'DARE'?
(a) DXEK (b) XEKB (c) CXEK (d) Cannot say

Directions *(Qs. 48-49) Read carefully following words and their codes given in the table below and answer the questions.*

JOIN	GPHN
GET	JFV
EAT	FAV
GREAT	JRFAW
FOUL	EPOL

48. How many alphabets have been retained as codes?
(a) 4 (b) 3 (c) 5 (d) 2

49. What will be the code for 'FIGURE'?
(a) EHJQRF (b) FHJQAR (c) FDELVF (d) FIJPRA

50. In a certain code "WHITE' is written as 'DSRGV, then how will 'BLACK' be written in the same code?
(a) YOZXP (b) OYZXP (c) XOZPY (d) YOZPX

Directions *(Qs. 51-52) A table of words and their codes is given below. Study the following pattern of transformation of code into words and answer the questions.*

ETG	PIG
TTE	TIP
KSY	CAN
ESKP	PACE
TBE	TOP
DPY	HEN
CPY	KEY
HBG	DOG
DBT	HOT
SOAPYT	ABSENT

51. How many alphabets have not been used as codes for each other?
(a) 1 (b) 4 (c) 3 (d) 5

52. Which of the following words can be successfully coded using the pattern based on the table?
(a) SOLITARY (b) EXPLODE (c) HINTED (d) DISASTER

53. If $L = 20$ and $RED = 51$, then BLUE = ?
(a) 65 (b) 72 (c) 76 (d) 82

54. If $GO = 105, SO = 285$, then RAT = ?
(a) 340 (b) 370 (c) 325 (d) 360

Directions *(Qs. 55-57) Study the following information carefully and answer the questions given below it.*

Letters	A	C	E	G	H	I	P	R	S	T	U
Codes	⌋	⌊	⌉	⁚	<	⊓	>	∧	<	□	⁝

55. What will be the code for SUGAR?
(a) < ⁚ ⁝ ⌉ ∧ (b) < ⁝ ⁚ ⌋ ∧
(c) < ⁝ ⁚ ⌋ ∧ (d) ⌊ ⁝ ⁚ ⌋ ∧

56. What will be the code for SPICE?
(a) < > ⊓ ⌊ ⌉ (b) < > ∧ ⌊ ⌉
(c) > < ⊓ ⌊ ⌉ (d) ∧ ⁚ ⌊ ⌉ ⊓

57. What will be the code for PATCH?
(a) < ⌊ □ ⌊ < (b) < ⌋ □ ⌊ <
(c) > ⌋ ⊓ ⌊ < (d) ⌊ > □ ⌊ <

58. From the given information, find the number stands for TEA.

$$\begin{array}{r} T\ A\ R \\ +\ R\ A\ T\ E \\ \hline 4\ 4\ 4\ 4 \end{array}$$

(a) 103 (b) 203 (c) 153 (d) 301

Directions *(Qs. 59-60) According to certain codes*
(i) 'Sachin wants car' means '123'.
(ii) 'Car is good' means '145'.
(iii) 'Sachin has good scooter' means '2467'.
(iv) 'Amit has car' means '718'.
(v) 'Car is precious' means '159'.

59. 'Good' is written as
(a) 6 (b) 4 (c) 5 (d) 1

60. Amit wants precious scooter is written as
(a) 8356 (b) 8396 (c) 6395 (d) 8394

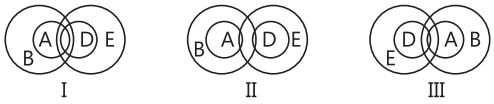
61. In the following multiplication, each of the different letters denotes a different integer. Each letter stands for the same integer throughout. If 'B' stands for '6' and 'E' stands for '8', then what is the difference between 'F' and 'D'?

$$\begin{array}{r} A\ B\ C \\ \times\ D\ E \\ \hline A\ C\ F\ B \\ E\ A\ G \\ \hline F\ H\ F\ B \end{array}$$

(a) 6 (b) 4 (c) 5 (d) 3

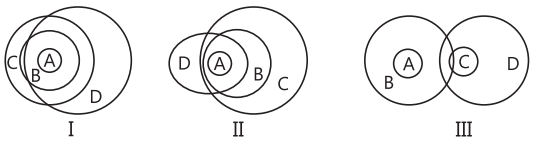
Directions *(Qs. 62-63) Read all the statements carefully and choose the correct diagram given below.*

62. If all A are B but some A are D and all D are E



(a) I and II (b) I and III
(c) II and III (d) None of these

63. If all A are B and all B are C but some C are not D and all A are D



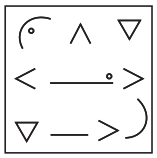
(a) I and II (b) I and III
(c) II and III (d) None of these

64. Which of the following diagrams shows the correct relationship amongst Animal, Dog, Pet?

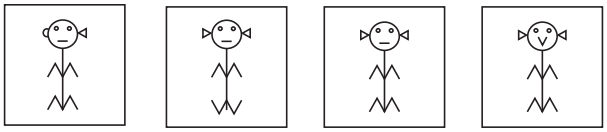
65. Which of the following diagrams shows the correct relationship amongst City, Country and State?

66. In the following question, find out which of the figures (a), (b), (c) and (d) can be formed from the pieces given in the question figure?

Question Figure



Answer Figures



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

67. Two men and two women are playing cards and are seated North, East, South and West of a table. No woman is facing East. Persons sitting opposite to each other are not of the same sex. One man is facing South, which direction ladies are facing?

(a) North and East (b) East and West
(c) South and East (d) North and West

68. Ashok's residence is 30 m away from that of Bhagwat towards South-West direction. Champak's house is 30 m away from that of Ashok's towards East, Deepek's house is 30 m away from Bhagwat towards West. Which of the following figures shows the correct direction of the given information?

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

69. A group of six friends are sitting in an arrangement each one at a corner of hexagon. Rakesh is sitting opposite Rajesh. Jaya is sitting next to Suman. Neelam is sitting opposite Suman but not next to Rakesh. Amit has a person between Rajesh and himself, then who is sitting opposite to Jaya?

(a) Suman (b) Rajesh (c) Amit (d) Neelam

70. Mukesh and Jagdish are older than Priyanka but younger than Sudha, who is of the same age as Srikant. Manju is younger than Priyanka. Hence, Srikant is

(a) younger than Priyanka (b) older than Manju
(c) younger than Manju (d) younger than Mukesh

71. Preeti is the daughter of Beena and Beena is the wife of Harsh. Harsh is the father of Santosh. Santosh is not the daughter of Beena. Find the relationship between Santosh and Preeti

(a) Mother-Daughter (b) Brother-Sister
(c) Father-Daughter (d) Husband-Wife

72. In a row of boys, Suresh is 8th from the left and Mukesh is also 8th from the right. When Suresh and Mukesh interchange their positions, Suresh becomes 16th from the left. What will be Mukesh's new position from the right?

(a) 17th (b) 16th (c) 15th (d) 18th

Directions *(Qs. 73-75) Read the given statement(s) as true and decide which of the conclusion logically follows from the statement.*

73. Statement Demonstrator protested against the New Education Policy.

Conclusions

I. Demonstrators are anti-social beings.
II. All education policies are bad.
III. Demonstrators often protest.

(a) I and II follow (b) I and III follow
(c) I, II and III follow (d) Data is insufficient

74. Statements

1. All pens are pencils.
2. No pencil is a monkey;

Conclusions

I. No pen is a monkey.
II. Some pens are monkey.
III. All monkeys are pens.

(a) Only I follows (b) I and III follow
(c) II and III follow (d) I, II and III follow

75. Statements

1. All books are trees.
2. All trees are words.

Conclusions

I. All books are words.
II. All words are books.
III. All trees are books.

(a) I and II follow (b) Only I follows
(c) II and III follow (d) I, II and III follow

76. Read the following statements

1. All ministers are law graduates.
2. Some ministers are ladies.

Which of these inferences is correct?

(a) All lady ministers are law graduates
(b) No male minister is a law graduate
(c) All law graduate ministers will be ladies
(d) No lady minister is a law graduate

77. Read the following statements to be true

1. All birds fly.
2. Hyla is a reptile.
3. Some reptiles fly.

Which of the inferences is correct?

(a) Hyla is a bird (b) Hyla may fly
(c) Reptiles and birds fly (d) Hyla flies

78. Which number is wrong in the given series?
3, 8, 15, 24, 34, 48, 63

(a) 8 (b) 15 (c) 34 (d) 24

79. Find out the missing term in the given series
4, 10, 28, 82, ?

(a) 262 (b) 284 (c) 244 (d) 168

80. I have few pens to be distributed. If I keep 4, 5 or 6 a pack, I am left with three pens. If I keep 7 in a pack, I am left with none. What is the minimum number of pens, I have to pack and distribute?

(a) 65 (b) 58 (c) 73 (d) 63

Directions *(Qs. 81-83) Find the wrong number.*

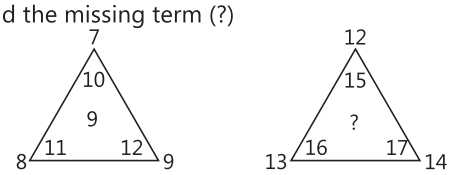
81. 2, 5, 11, 23, 48, 95

(a) 11 (b) 23 (c) 48 (d) 95

82. 3, 6, 18, 72, 380, 2160
(a) 380 (b) 72 (c) 18 (d) 2160

83. 143, 156, 169, 182, 221, 232, 247
(a) 169 (b) 182 (c) 232 (d) 247

84. Find the missing term (?)



(a) 12 (b) 9 (c) 10 (d) 8

85. How many such pair of digits are there in the number 98314625 each of which has as many digits between them in the number as when they are arranged in ascending order?
(a) 4 (b) 3 (c) 2 (d) 5

Directions *(Qs. 86-90) A cube of side 4 cm has been painted with different colours. The opposite two surfaces are painted with different colours. The opposite two surfaces are painted silver colour and the other two opposite surfaces are painted mehroon colour. Out of the remaining two surfaces one is painted green colour and other is painted orange colour and after that cube is cut into 64 smaller equal cubes.*

86. How many cubes will have all three colours green, orange and mehroon?
(a) 4 (b) 8 (c) 7 (d) 24

87. How many cubes will have only two colours i.e., green and mehroon?
(a) 12 (b) 4 (c) 6 (d) 14

88. How many cubes will have only one silver colour?
(a) 12 (b) 8 (c) 10 (d) 4

89. How many cubes will have only orange colour?
(a) 4 (b) 8 (c) 12 (d) 10

90. How many cubes will not have any coloured face?
(a) 12 (b) 8 (c) 20 (d) 16

Paper II : Scholastic Aptitude Test (SAT)

Time : 90 Minutes **Max. Marks :** 90

91. After long exercise the muscle cramps is due to formation of
(a) citric acid (b) glycogen
(c) lactic acid (d) ATP

92. Match column I with column II and select the correct answer from codes given below

Column I	Column II
A. Red eye frog	P. Thick skin and strong sense of smell
B. Toucan	Q. Thick skin and sensitive hearing
C. Big cat	R. Long large beak
D. Polar bear	S. Sticky pad

Codes

	A	B	C	D		A	B	C	D
(a)	P	Q	R	S	(b)	Q	R	S	P
(c)	S	R	Q	P	(d)	R	S	P	Q

93. Which one of the following is not a reason for shortage of usable water?
(a) Irrigation by tube wells
(b) Flowing of water from pump in drainage
(c) Increase in use for domestic animals
(d) Decrease in sea level

94. Asexual reproduction in ginger, potato and onion takes place through
(a) stem (b) leaves (c) roots (d) None of these

95. The role of air pumped in waste water treatment plant is
(a) to minimize the growth of aerobic bacteria
(b) to support the growth of aerobic bacteria
(c) to provide nutrient to bacteria
(d) to pressurise the water which has been treated

96. The deoxygenated blood from various parts of body enter into heart by
(a) pulmonary veins (b) veins
(c) pulmonary artery (d) artery

97. Which of the following is correct in response to soil?
(a) Clay particles are light as they hold less water and the space between sand particle is less
(b) Clay particles are heavy as they hold more water and the space between sand particles is less
(c) Clay particles are heavy as they hold more water and space between sand particle is more
(d) Clay particles are light as they hold more water and the space between sand particles is more

98. Match column I with column II and select the correct answer using codes given below it

Column I	Column II
A. Winnowing	P. Irrigation
B. Threshing	Q. Hoe
C. Drip system	R. Separation of grains and chaff
D. Weeds	S. Separation of seeds and chaff

Codes

	A	B	C	D		A	B	C	D
(a)	P	Q	R	S	(b)	S	R	Q	P
(c)	Q	P	R	S	(d)	R	S	P	Q

99. Silk is produced by
(a) cocoon/pupa (b) larva
(c) adult moth (d) cephalic gland

100. Red data book provides the information about
(a) natural plants and animals
(b) protected plants and animals
(c) endangered animals and plants
(d) genetically modified plants and animals

101. Why the two sisters born looked exactly same?
(a) Due to same environment
(b) Due to same genes
(c) Due to same parents
(d) Due to birth at same time

102. Baker's yeast is added to aquarium because it
(a) provides oxygen
(b) absorbs nutrients
(c) absorbs oxygen from it
(d) provides minerals and metals

103. Match column I with column II

Column I	Column II
A. Lohi	P. Hosiery
B. Nali	Q. Coarse wool
C. Patanwadi	R. Carpet wool
D. Marwari	S. Good quality wool hosiery

Codes

	A	B	C	D		A	B	C	D
(a)	S	R	P	Q	(b)	R	S	Q	P
(c)	P	Q	R	S	(d)	S	Q	P	R

104. Which of the following is required for change of frog from tadpole to adult?
(a) Sodium (b) Iron
(c) Iodine (d) Magnesium

105. Polycot is a mixture of
(a) polythene + cotton (b) nylon + cotton
(c) polyester + cotton (d) None of the above

106. Match column I with column II and choose the correct answer using the codes given below

Column I	Column II
A. Melamine	P. Non-stick cookwere
B. Nylon	Q. Appears like silk
C. Teflon	R. Easily biodegradable
D. Cotton	S. Flame resistant

Codes

	A	B	C	D		A	B	C	D
(a)	S	P	Q	R	(b)	P	S	R	Q
(c)	S	P	R	Q	(d)	S	P	Q	R

107. An element when burnt in air, forms an oxide which is a good dehydrating agent. The oxide on dissolution in water gives its oxyacid. The oxide forms salt with caustic soda but not with sulphuric acid. The oxyacid of the element is
(a) phosphorus acid (b) phosphoric acid
(c) hypophosphorus acid (d) boric acid

108. Match column I with column II and choose the correct answer using the codes given below

Column I	Column II
A. Iron	P. Can be cut easily with a knife
B. Copper	Q. Liquid at room temperature
C. Potassium	R. Formation of green layer on exposure to moist air
D. Mercury	S. Deposition of reddish brown layer on exposure to moist air.

Codes

	A	B	C	D		A	B	C	D
(a)	S	R	Q	P	(b)	S	R	P	Q
(c)	P	Q	R	S	(d)	S	R	Q	P

109. Naphthalene is obtained from
(a) coal tar (b) light oil fraction
(c) ethyne (d) All of these

110. Consider the following statement about natural gas
1. Its main constituent is methane.
2. It is a raw material for the manufacture of fertilizer.
3. It is used to generate electricity.

Correct statement(s) is/are
(a) 1, 2 and 3 (b) 1 and 2
(c) only 1 (d) 2 and 3

111. The head of match stick contains
(a) antimony trisulphide + potassium chloride
(b) antimony chloride + red phosphorus
(c) white phosphorus only
(d) antimony trisulphide + potassium chlorate

112. The decreasing order of temperature of different zones of a candle is
(a) innermost zone, middle zone, outermost zone
(b) middle zone, innermost zone, outermost zone
(c) outermost zone, innermost zone, middle zone
(d) outermost zone, middle zone, innermost zone

113. Greenhouse effect results in
1. trapping of radiation on the Earth atmosphere.
2. increase in the Earth temperature which is known as global warming. The correct statement is/are

(a) Only 1 (b) 1 and 2 (c) Only 2 (d) Neither 1 nor 2

114. Consider the following pairs
1. Lemon-citric acid
2. Sting-acetic acid
3. Bauxite-aluminium oxide
4. Calamine-zinc oxide

Which pairs is/are not correctly matched?
(a) 2 and 3 (b) 2 and 4 (c) 1 and 4 (d) 2, 3 and 4

115. What will be the effect of adding ammonium nitrate to soil?
(a) The soil becomes alkaline
(b) Soil first becomes alkaline then acidic
(c) Soil first becomes acidic then alkaline
(d) The soil becomes acidic

116. Consider the following changes
1. Hammering of red hot iron to make flat sheet.
2. Formation of ice by cooling water.
3. Vapourisation of sea water.

The example(s) of physical change(s) is/are
(a) 1, 2 and 3 (b) 1 and 2 (c) 2 and 3 (d) 1 and 3

117. Consider the following changes
1. Burning of candle wax.
2. Crystallisation of blue vitriol.
3. Passing of CO_2 gas through lime water.

Which of these are considered as chemical change?
(a) 1, 2 and 3 (b) 1 and 2 (c) 1 and 3 (d) 2 and 3

118. Why is it difficult to drive a car on a rainy day?
(a) On wet road friction increases
(b) On wet road friction decreases
(c) The brakes of car do not work
(d) None of the above

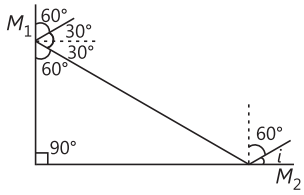
119. Consider the following statements
(i) Concave mirror forms virtual and enlarged image of a real object placed very near to it, so it is used by dentists to examine teeth.

(ii) Concave mirror always forms virtual image of smaller size of a real object and it is thinner in middle.
(iii) Plane mirror always forms virtual image of the same size of a real object.
(iv) Convex mirror always forms virtual image of bigger size of a real object.
(v) Convex lens forms real and diminished image of a real object placed near to it, so it is used as reading glass.

Which are the correct statements?

(a) (i), (ii) and (iii) (b) (ii) and (iii)
(c) (iv) and (v) (d) All of the above

120. Two plane mirrors are inclined to each other at an angle of 90° as shown in figure. A ray of light falls on the mirror M_1 at angle 60° and after reflection, falls on the other mirror M_2 from which it get reflected by angle i. The value of $\angle i$

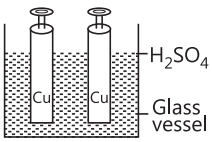


(a) 60° (b) 70° (c) 30° (d) 90°

121. Atmospheric pressure at the centre of a tropical cyclone is

(a) very high (b) very low
(c) normal (d) zero

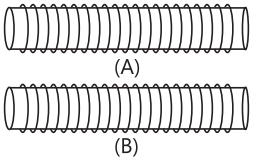
122.



If two copper plates are moved further apart from each other, then

(a) less copper deposited
(b) more cppper deposited
(c) same copper deposited
(d) two times copper deposited

123.



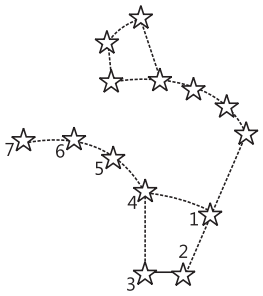
Both electromagnets (A) and (B) consist of a coil of insulated wire wrapped around an iron core. Then,

(a) electromagnet (A) has more strength of magnetic field
(b) electromagnet (B) has more strength of magnetic field
(c) Both electromagnets (A) and (B) have same strength of magnetic field
(d) Data insufficient

124. The pattern in which the iron fillings will align, if a current carrying straight conductor is kept in the mid of iron fillings is

(a) straight line (b) concentric circle
(c) remain as such (d) zigzag manner

125.



Which of the above represent pointer stars?

(i) 1 and 2 (ii) 3 and 4 (iii) 4 and 5 (iv) 1 and 3
(v) 2 and 4 (vi) 6 and 7

The correct option is

(a) (i) and (iv) (b) (ii), (iii) and (iv)
(c) Only (i) (d) All of these

126. The value of 25°C on Fahrenheit scale is

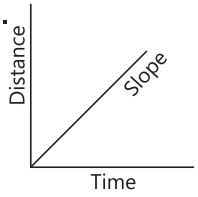
(a) 77°F (b) 35°C (c) 22°F (d) 22°F

127. To protect yourself from lightening you will

(i) go under a building and small trees.
(ii) crouch on your feet.
(iii) stand on the ground.
(iv) lie on the ground.

(a) (i) and (ii) (b) (ii) and (iii)
(c) (iii) and (iv) (d) (i) and (iv)

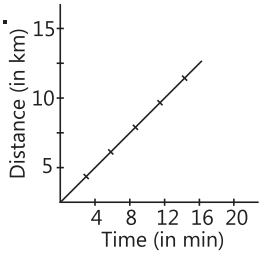
128.



This graph shows

(a) constant speed (b) constant acceleration
(c) constant velocity (d) None of these

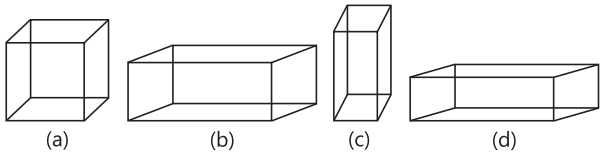
129.



What is the average speed between time 4 min and 20 min?

(a) $\frac{5.5}{8}$ km/min (b) $\frac{5}{8}$ km/min
(c) $\frac{4.9}{8}$ km/min (d) $\frac{4.5}{8}$ km/min

130. Which of the following cuboid will exert maximum pressure, when applied thrust is same?



131. The cost of a pen is ₹ 5 and the cost of a pencil is ₹ 1. The ratio between number of pen and pencil is 2 : 3. If 12% and 10% increment of cost of pen and pencil respectively, then the total selling price of both is ₹ 725. What is the difference between number of pen and pencil?

(a) 30 (b) 50 (c) 59 (d) 63

132. Due to the higher tax of the commodity, government decide to decrease 15% tax of the commodity. But the consumption is increased by 10%. Then, the decreasing percentage in revenue corresponding to new revenue is

(a) 4.5% (b) 5.5% (c) 6.5% (d) 7.3%

133. The unit digit in the product of $3^{1001} \times 7^{1002} \times 13^{1003}$ is

(a) 3 (b) 5 (c) 7 (d) 9

134. Square root of a number lies between 6 and 7. Then, the cube root of this number lies between

(a) 2 and 3 (b) 2.4 and 3.4
(c) 3 and 4 (d) None of these

135. If one angle of a regular polygon be 165°, then number of sides of the polygon are

(a) 6 (b) 24 (c) 27 (d) 36

136. If x is inversely proportional to y and x is increased by 20%, then y decreased by

(**Note** x and y have same initial value)

(a) $12\frac{1}{3}\%$ (b) $16\frac{2}{3}\%$ (c) $17\frac{2}{3}\%$ (d) $22\frac{4}{5}\%$

137. The acid present in our stomach which helps in digestion of food is

(a) sulphuric acid (H_2SO_4)
(b) nitric acid (HNO_3)
(c) hydrochloric acid (HCl)
(d) phosphoric acid (H_3PO_4)

138. How many factors of $(2^{48} - 1)$ lie between 2 and 10?

(a) 0 (b) 1 (c) 2 (d) 3

139. A four-digit number in which the sum of first and last digit is 7, the sum of second and third digit is 7. If this number is added to a number obtained by reversing the digits of the given number, then the sum is not divisible by which one of the following numbers?

(a) 7 (b) 11 (c) 101 (d) 111

140. In a deer's herd half of it grazing in the field and its 3/4 are playing and rest of the half *i.e.*, 9 deers are drinking water in the field. Then, the multiple of difference between the number of deers which are grazing and playing in the field is

(a) 2 (b) 5 (c) 7 (d) 9

141. If x is a supplementary angle of y and x is smaller angle which is four times complementary angle of itself, then the difference between x and y is

(a) 18° (b) 36° (c) 46° (d) 54°

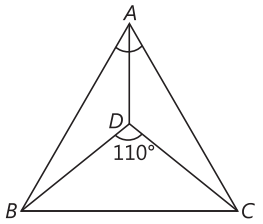
142. If the ratio of the angles of any quadrilatral is 3 : 7 : 6 : 4, then the quadrilatral should be a

(a) square (b) parallelogram
(c) trapezium (d) rhombus

143. If the ratio of the interior angles of a triangle is 2 : 4 : 9, then the difference between one of the exterior angles of the triangle is

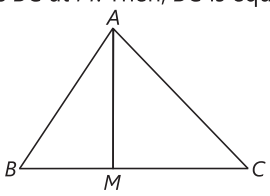
(a) 20° (b) 44° (c) 50° (d) 60°

144. In the given figure, ΔABD and ΔACD are congruent triangles. $\angle BAC = 60°$ and $\angle BDC = 110°$ then find $\angle ABC$



(a) 15° (b) 22° (c) 35° (d) None of the above

145. In ΔABC, $AB = 4$ cm, $AC = 8$ cm and AM is the median which meets BC at M. Then, BC is equal to



(a) 4 cm (b) $2\sqrt{31}$ cm (c) $5\sqrt{3}$ cm (d) $7\sqrt{2}$ cm

146. Two circles with different radius in which the circumference of second circle is x times and area of second circle is twice of the first circle. Then, the value of x is

(a) 1 (b) 2 (c) $\sqrt{2}$ (d) $\frac{1}{2}$

147. What is the maximum area of a triangle inscribed in a semi-circle?

(a) $r/2$ (b) $2r$ (c) r^2 (d) $\frac{3r^2}{2}$

148. The angle between the diagonal and side bisector of a hexagon at centre is

(a) 30° (b) 60° (c) 120° (d) 90°

149. If the coordinates of four points A, B, C and D are (4, 0), (6, 3), (4, 6) and (2, 3), respectively of any quadrilateral. Then, the quadrilateral should be a

(a) square (b) rectangle
(c) rhombus (d) parallelogram

150. The mode, median and range of the following observations are

45, 84, 21, 77, 56, 84, 39, 54, 56, 39, 54, 56

Then the mean of mode, median and range are

(a) 65, 55, 36 and 52 (b) 56, 58, 60 and 58
(c) 56, 55, 63 and 58 (d) None of these

151. Match column I with column II

Column I	Column II
A. Dhangadeva	P. Kandariya Mahadeva Temple
B. Rajarajadeva	Q. Rajarajeshvara Temple
C. Rajendra I	R. Gangaikondacholapuram
D. Babur	S. Chahar Bagh

Codes

	A	B	C	D		A	B	C	D
(a)	Q	R	P	S	(b)	R	Q	S	P
(c)	S	R	Q	P	(d)	P	Q	R	S

152. Which of the following describes the common property resource?

(a) Forests owned by the state

(b) Pastures, grazing lands used by community
(c) Woodlands, orchards used by cooperatives
(d) Fruit orchards, grasslands owned by individual

153. Consider the following statements
1. Alvars saints of South India were followers of Lord Agni.
2. Nayanars were worshippers of Lord Shiva.

Which of the above statement(s) is/are correct?
(a) Only 2 (b) Only 1
(c) Both 1 and 2 (d) None of these

154. Consider the following statements about Mughal period
1. Bakshi was responsible for paying salaries to soldiers.
2. Faujdar was the Prime Minister.
3. Sadr-us-Sadar was responsible to take care of religious behaviour of people.
4. Kotwal look after the law and order of city.

Which of the above statement(s) is/are correct? ,
(a) 1, 3 and 4 (b) 1,2, 3 and 4
(c) 1 and 2 (d) 1,2 and 3

155. What do you mean by 'Pietra Dura'?
(a) Coloured hardstones placed in depressions, carved into marble sandstone
(b) Baolis
(c) Coloured rooms
(d) None of the above

156. Consider the following statements about Kathak
1. Kathak word derived from the word "Katha" (Story tellers).
2. Kathak later developed by Bhakti Saints.
3. Nawab Siruj-ud-daula patronised Kathak and later Mughals.

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

157. Consider the following statements
1. Kanchipuram was the capital of Hampi.
2. Masulipatnam emerged as an important town during Narsimhavarman.
3. Hampi was the capital of Pallavas during sultanate period.
4. Bombay emerged as an important town during colonial period.

Which of the above statement(s) is/are correct?
(a) Only 2 (b) 2 and 3
(c) 1, 2 and 3 (d) 2 and 4

158. Garh was divided into Chaurasi, into Barhots and later into smallest unit known as
(a) Town (b) City (c) District (d) Village

159. Who was the only woman Sultan during Sultanate period?
(a) Tarabai (b) Raziya Begum
(c) Mumtaz (d) None of these

160. Who divided the Indian History into Hindu, Muslim and British?
(a) RD Bannerji (b) JP Joshi
(c) Daya Ram Sahni (d) James Mill

161. Dual Administration was established in Bengal by
(a) Clive (b) Warren Hastings
(c) Wellesley (d) Dalhousie

162. Who felt that childhood ought to be a time of self-learning, outside the rigid and restricting discipline of the schooling system setup by the British?
(a) Raja Ram Mohan Roy (b) Mahatma Gandhi
(c) Rabindranath Tagore (d) Bal Gangadhar Tilak

163. Match Column I with Column II

Column I	Column II
A. Rashtriya Swayamsevak Sangh	P. 1870
B. All India Muslim League	Q. 1885
C. Indian Association	R. 1906
D. Indian National Congress	S. 1920

Codes

	A	B	C	D		A	B	C	D
(a)	P	Q	R	S	(b)	S	R	P	Q
(c)	Q	R	S	P	(d)	R	Q	S	P

164. Greenwich Mean Time line passes through which of the following countries?
(a) England (b) USA (c) India (d) China

165. Mixed Economy means
(a) co-existence of small and large industries
(b) promoting both agriculture and industries in the economy
(c) co-existence of public and private sectors
(d) co-existence of rich and poor

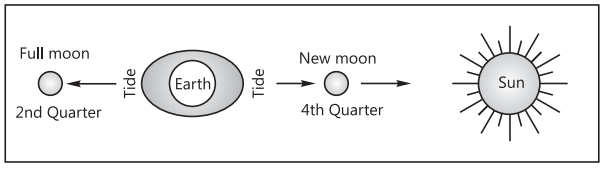
166. What is/are function(s) of a Tehsildar?
(a) They have to hear disputes
(b) They supervise the work of a Patwari
(c) They ensure that land revenue is collected
(d) All of the above

167. Which of the following is not the obligation of the Prime Minister of India?
(a) He advises the President to dissolve the Parliament
(b) He is the leader of the majority party in the Lok Sabha
(c) He is the Nominal Head of the State
(d) He is the Chief Advisor to the President of India

168. Consider the following statements
1. Westerlies are stronger in Southern hemisphere.
2. Westerlies are weaker in Northern hemisphere.
3. Westerlies are weaker in Southern hemisphere.

Which of the above statement(s) is/are correct?
(a) 1, 2 and 3 (b) 1 and 3 (c) 2 and 3 (d) Both 1 and 2

169. The given diagram represents



(a) neap tides (b) high tides
(c) low tides (d) spring tides

170. Match the following columns

Column I (National Park)	Column II (State)
A. Kanha National Park	P. Madhya Pradesh
B. Nokrek National Park	Q. Meghalaya
C. Simlipal National Park	R. Odisha
D. Hazaribagh National Park	S. Jharkhand

Codes

A B C D	A B C D
(a) R S Q P	(b) S R Q P
(c) Q R P S	(d) P Q R S

171. The gas you use in kitchen is called Liquified Petroleum Gas (LPG). In the cylinder, it exists as a liquid. When it comes out of the cylinder, it becomes a gas (process A), then it burns (process B). Choose the correct statement
(a) Process A is a chemical change
(b) Process B is a chemical change
(c) Both processes A and B are chemical change
(d) None of these processes is a chemical change

172. Which area in France is significant for coal fields?
(a) Korba (b) Lorraine
(c) Hazaribagh (d) Hindger

173. Indianapolis lies in the
(a) USA (b) France (c) Japan (d) Germany

174. Which of the following is employed to clearly view objects which cannot be seen directly due to obstruction?
(a) Laser (b) Periscope
(c) Kaleidoscope (d) None of these

175. Ozone gas is found in which layer?
(a) Troposphere (b) Stratosphere
(c) Mesosphere (d) Exosphere

176. Match the following columns

Column I	Column II
A. Shifting Cultivation	P. Rengmas
B. Pastoralism	Q. Kirghiz
C. Hunter and Food Gatherers	R. Pygmies
D. Hunters	S. Eskimos

Codes

A B C D	A B C D
(a) S R Q P	(b) R Q S P
(c) Q P S R	(d) P Q R S

177. Match the following columns

Column I (Region)	Column II (Grasslands)
A. Argentina	P. Pampas
B. North America	Q. Praries
C. South Africa	R. Velds
D. Central Asia	S. Steppes
E. Australia	T. Downs

Codes

A B C D E	A B C D E
(a) S R Q P T	(b) T S R Q P
(c) P Q R S T	(d) Q P R S T

178. Surat and Masulipatnam were important trading towns in 17th century. However, in the 18th century they lost their importance. Which of the following was not responsible for their decline?
(a) Loss of market and productivity because of the decline of the Mughal Empire
(b) Control of sea-routes by the Portuguese and competition from Bombay
(c) Fierce competition among various trading groups like Golconda nobles, Persian merchants etc.
(d) Shifting of company trade centres to Bombay, Calcutta and Madras

179. Consider the following statements
1. Upward movement of warm air is called evaporation.
2. Condensation occurs in upper troposhere.
3. Condensation occurs in ionosphere.

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

180. **Assertion** Bengaluru has developed as a major IT centre in India.

Reason The Government of Karnataka was the first to pass and announce an IT Policy in 1992.

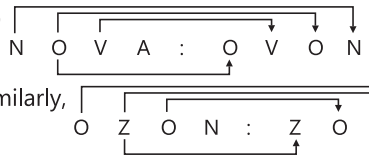
Select the correct answer from the given alternatives
(a) A is false, R is true (b) A is true, R is false
(c) Both A and R are true (d) Both A and R are false

Answers

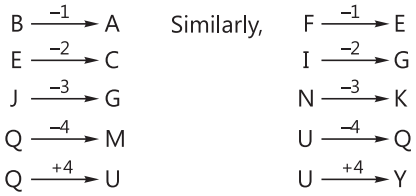
1.	(b)	**2.**	(b)	**3.**	(a)	**4.**	(a)	**5.**	(b)	**6.**	(c)	**7.**	(d)	**8.**	(a)	**9.**	(d)	**10.**	(d)
11.	(c)	**12.**	(d)	**13.**	(b)	**14.**	(c)	**15.**	(a)	**16.**	(b)	**17.**	(d)	**18.**	(c)	**19.**	(b)	**20.**	(a)
21.	(a)	**22.**	(b)	**23.**	(d)	**24.**	(c)	**25.**	(b)	**26.**	(c)	**27.**	(a)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

Hints & Solutions

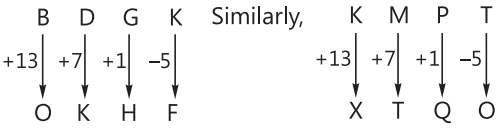
1. (b)



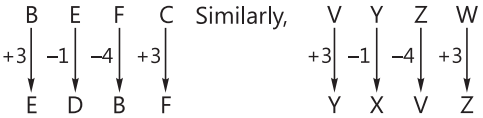
2. (b)



3. (a)



4. (a)



5. (b) $3^2 = 9, 7^2 = 49, (0.12)^2 = 0.0144$

6. (c) $4 \times 5 \times 4 = 80; 5 \times 6 \times 5 = 150; 8 \times ? \times 8 = 448$

$$? = \frac{448}{64} = 7$$

7. (d) $3 \times 2 + 1 = 7; 7 \times 2 + 1 = 15; 15 \times 2 + 1 = 31$

Similarly, 9

$9 \times 2 + 1 = 19; 19 \times 2 + 1 = 39; 39 \times 2 + 1 = 79$

So, 9, 19, 39, 79

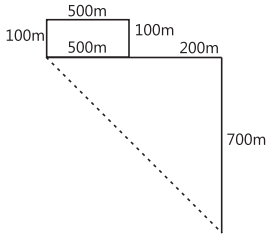
8. (a) $90 = 9 \times 10$ and $81 = 9^2$

Similarly, $120 = 12 \times 10$ and $(12)^2 = 144$

9. (d) $3^4 : 3^1 : 3^3$ Similarly $5^4 : 5^1 : 5^3$

i.e., 625, 5.

11. (c)



i.e., 700 + 700 = 1400 m

12. (d) $5 \times 5 = 25; 3 \times 17 = 51; 6 \times 16 = 96; 25 \times 5 \neq 75$

13. (b) By observation option (b) is different from others.

14. (c) Move clockwise all figure.

Hence, option (c) will be odd one out.

15. (a) (5, 1), (7, 3), (5, 1), (7, 3), (5, 1), (5, 1)

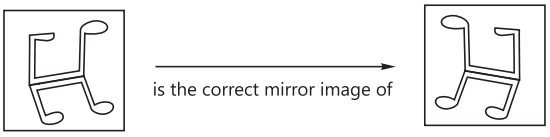
16. (b) (2, 8, 6), (2, 8, 6), (2, 8)

17. (d) (6, 8, 4), (6, 8, 7), (6, 8, 3), (6, 8)

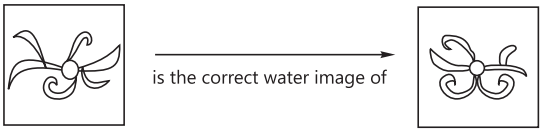
18. (c) (3, 9), (6, 36), (8, 64), (5, 25), (2, 4), (4, 16).

19. (b) Option (b) is correct mirror image of given figure.

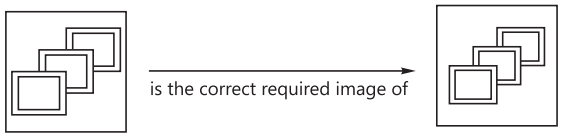
20. (a)



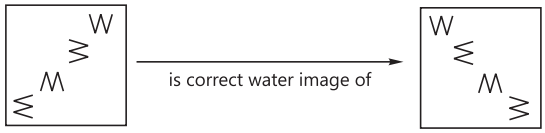
21. (a)



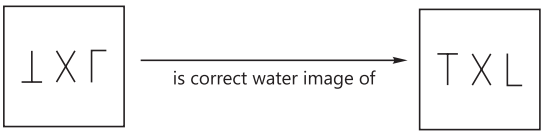
22. (b)



23. (d)



24. (c)



25. (b) Let Gopal be x yr and Govind be y yr. According to question,

$x + 16 = 3x$ *i.e.*, $x = 8$ yr

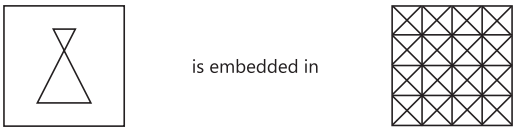
26. (c) 16th June → Friday

23rd June → Friday

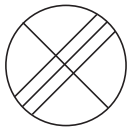
30th June → Friday

7th July → Friday

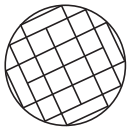
27. (a)



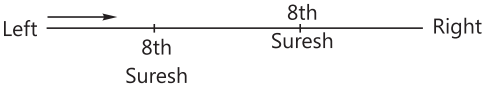
28. (b)



Answer figure (b) is not embedded in



29. (c)

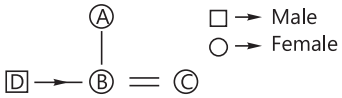


When mukesh and Suresh interchange their position, Suresh became 16th from the left.

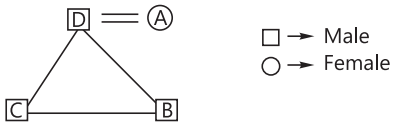
Then, total boys $= 8 + 16 - 1$

$\Rightarrow \quad 24 - 1 = 23$

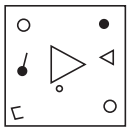
30. (b)



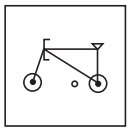
31. (d)



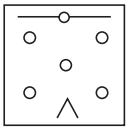
32. (c)



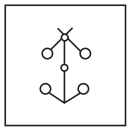
are all components found in



33. (d)



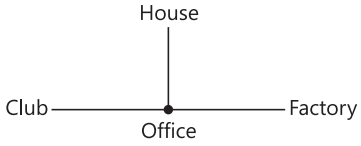
are all components found in



34. (a)

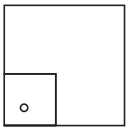
is required form of

35. (b)

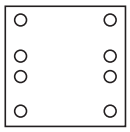


36. (b) If P moves one and half quarter clockwise, then P will be in North-West.

37. (d)



is folded pettern of



For Qs. 38 to 40

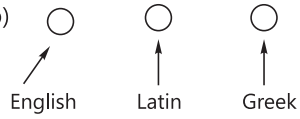
38-40		Science	Maths	Cricket	Tennis	Music
	A	✓	✓	✓		
	B		✓	✓	✓	
	C	✓	✓		✓	
	D	✓		✓	✓	✓
	E			✓		✓

38. (a) A is good in Cricket, Maths and Science.

39. (b) C is good in Science, Tennis and Maths.

40. (b) B is not good in both Science and Music.

41. (b)

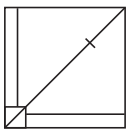


42. (a) 3 teachers are both players and artists.

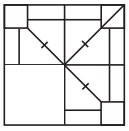
43. (a) 4 represents uneducated unemployed youths in village.

44. (c) 7 represents employed educated youths in village.

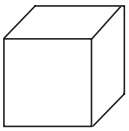
45. (c)



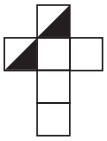
will complete the pattern of



46. (b)



look unfolded as



47. (d) There is no code defined for letter D.

48. (b) A is coded A, R is coded R.

49. (a) FIGURE will be coded as EHJQRF.

50. (a)

$W \rightarrow D$		$B \rightarrow Y$
$H \rightarrow S$		$L \rightarrow O$
$I \rightarrow R$	Simiilar,	$A \rightarrow Z$
$T \rightarrow G$		$C \rightarrow X$
$E \rightarrow V$		$K \rightarrow P$

51. (d) There are only 5 alphabets have not been used as codes for each other.

52. (c) HINTED can be coded successfully using the given pattern.

53. (b) $L = 12 + 8 = 20,\ R = 18 + 8 = 26,$

$E = 5 + 8 = 13, D = 4 + 8 = 12$

i.e,. $RED = 26 + 13 + 12 = 51$

$B = 2 + 8 = 10, L = 12 + 8 = 20,$

$U = 21 + 8 = 29,\ E = 5 + 18 = 23$

$BLUE = 10 + 20 + 29 + 13 = 72$

54. (d) $GO = 7 \times 15 = 105$

$SO = 19 \times 15 = 285$

$RAT = 18 \times 1 \times 20 = 360$

55. (c) SUGAR $\xrightarrow{\text{Coded}}$ 

56. (a) SPICE $\xrightarrow{\text{Coded}}$ 

57. (b) PATCH $\xrightarrow{\text{Coded}}$ 

58. (a)

$$\begin{array}{r} T\ A\ R \\ +R\ A\ T\ E \\ \hline 4\ 4\ 4\ 4 \end{array} \qquad \begin{array}{r} 1\ 3\ 4 \\ +4\ 3\ 1\ 0 \\ \hline 4\ 4\ 4\ 4 \end{array}$$

59. (b) From Statements 2 and 3 Good is coded as 4.

60. (b) Amit's code = 8

Wants code = 3

Precious code = 9

Scooter code = 6

Amit wants precious scooter will be coded as

8 3 9 6.

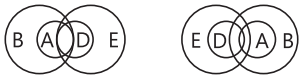
61. (b)

	A	B	C
	×	D	E
A	C	F	B
E	A	G	×
F	H	F	B

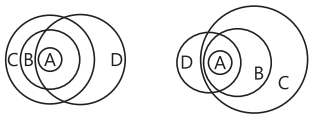
	1	6	2
	×	5	8
1	2	9	6
8	1	0	×
9	3	9	6

F – D = 9 – 5 = 4

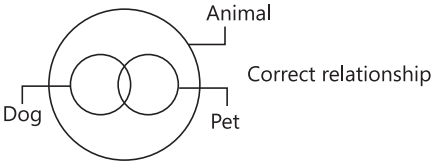
62. (b) First and third figures follow all the statements.



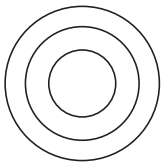
63. (a) Both first and second figures follow all the statements.



64. (b)



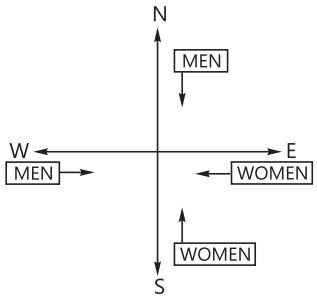
65. (c)


Correct relationship

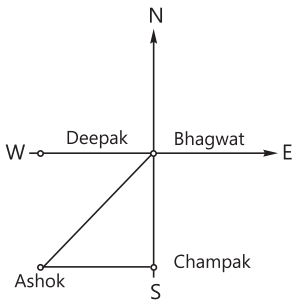
66. (c) Diagram 'C' has all the components


has all components of

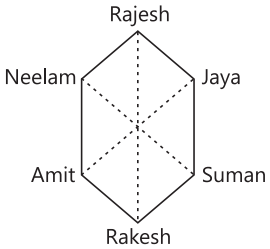
67. (d)



68. (d)

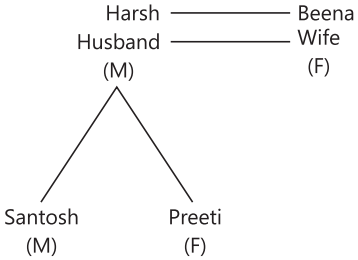


69. (c)

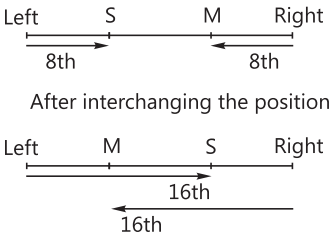


70. (b) Sudha = Srikant > Mukesh and Jagdish > Priyanka > Manju. So, Srikant > Manju.

71. (b)

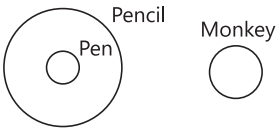


72. (b)

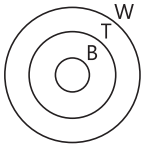


73. (d) Data is unsufficient to draw conclusion.

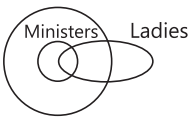
74. (a)



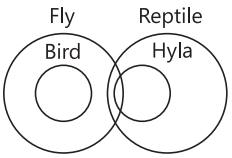
75. (b)



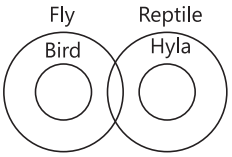
76. (a) Law Graduate



77. (b) **Case I**



Case II



78. (c) 3, 8, 15, 24, (34), 48, 63

5 7 9 10 14 15

79. (c) 4 10 28 82 244

+6 +6×3 +18×3 +54×3

80. (d) (LCM of 4, 5, 6) + 3 = 60 + 3 = 63

When 63 ÷ 7,

No remainder left.

81. (c)

2 5 11 23 [48] 95

×2+1 ×2+1 ×2+1 ×2+1 ×2+1

82. (a)

3 6 18 72 [380] 2160

×2 ×3 ×4 ×5 ×6

83. (c)

143 158 169 182 221 232 247

+26 +52 +26

+26 +52

Should be 234

84. (b) (10 + 11 + 12) – (7 + 8 + 9) = 9

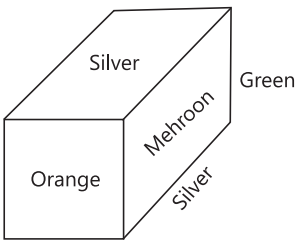
Hence, (15 + 16 + 17) – (12 + 13 + 14) = 9

85. (a)

9 8 3 1 4 6 2 5

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

For Qs. 86 to 90



86. (a) All such cubes will be at 4 corners, so 4 cubes.

87. (b) All such cubes will be at only two edges and each edge contains 2 such cubes. Total = 4.

88. (b) All such cubes will be at only two surfaces. One surface has 4 cubes, so total 8.

89. (a) All such cubes will be at only one surface *i.e.*, 4.

90. (b) Total cubes – coloured cube = 64 – 56 = 8

91. (c) In an aerobic respiration in muscles lactic acid is produced which causes muscle cramps.

92. (c)

Column I	Column II
A. Red eyed frog	S. Sticky Pad
B. Toucan	R. Long large beak
C. Big cat	Q. Thick skin and sensitive hearing
D. Polar bear	P. Thick skin and strong sense of smell

93. (d) Decrease in sea level is not a reason for shortage of usable, water.

94. (a) Asexual reproduction in ginger, potato and onion takes place through stems and underground stem of ginger known as rhizome, potato-tuber, onion-bulb. In bryophyllum adventitious buds are present on leaves reproduce asexually.

95. (b) In waste water treatment plant air is pumped into water to support the growth of aerobic bacteria. These bacteria consume waste.

96. (b) In human blood circulation deoxygenated blood from body enters into heart through veins. From heart it goes to lungs for oxygenation through pulmonary artery. From lungs it comes to heart through pulmonary vein and from heart it goes to body again.

97. (c) Clay particles are heavy as they hold more water and space between sand particles is more.

98. (d)

Column I	Column II
A. Winnowing	R. Separation of grains and chaff
B. Threshing	S. Separation of seeds and chaff
C. Drip system	P. Irrigation
D. Weeds	Q. Hoe

99. (a) Larva/Caterpillar when enters the next stage of its life history called pupa. During this, it swings its head from side to side in the form of the figure of eight. During this movement of the head the caterpillars secrets fibres made of protein which harden to form silk fibres.

100. (c) Red data book provides the information on endangered animals and plants.

101. (b) Due to presence of same genes two sisters look exactly same.

102. (d) Baker's yeast is added to aquarium because it provides minerals and metals and absorbs heavy metals present in water and purifies it.

103. (a)

Column I	Column II
A. Lohi	S. Good quality wool hosiery
B. Nali	R. Carpet wool
C. Patanwadi	P. Hosiery
D. Marwari	Q. Coarse wool

104. (c) In frogs change from tadpole to adult is controlled by thyroxin. Thyroxin production requires the presence of iodine in water.

105. (c) Polycot = Polyster + cotton

106. (a) Melamine — Flame resistant

Nylon — Appears like silk

Teflon — Non-stick cookwares

Cotton — Easily biodegradable

107. (b) $P_4 + O_2 \rightarrow P_2O_5$

$P_2O_5 + H_2O \rightarrow H_3PO_4$ (phosphoric acid)

$6NaOH + P_2O_5 \rightarrow 2Na_3PO_4 + 3H_2O$

108. (b) Iron-Deposition of reddish brown layer on exposure to moist air

Copper — Formation of green layer on exposure to moist air

Potassium — Can be cut easily with a knife

Mercury — Liquid at room temperature

109. (a) Naphthalenes is obtained from coaltar.

110. (a) Natural gas have main constituent CH_4.
It is used as raw material for manufacturing of fertilizer.
It is also used for the generation of electricity.

111. (d) Head of match stick = antimony trisulphide (Sb_2S_3) + potassium chlorate ($KClO_3$)

112. (d) Candle flame 1. Outermost zone 2. Middle zone 3. Innermost zone (decreasing order of temperature)

113. (b) 1. Due to greenhouse effect radiation is trapped in earth atmosphere.
2. Due to greenhouse effect earth temperature rises which is known as global warming.

114. (b) Sting-formic acid (HCOOH)
Calamine-zinc carbonate ($ZnCO_3$)

115. (d) Fertilizers are acidic in nature (ammonium nitrate) so, soil becomes acidic when used for a long time period. Slaked lime is also used for treatment of acidic soil.

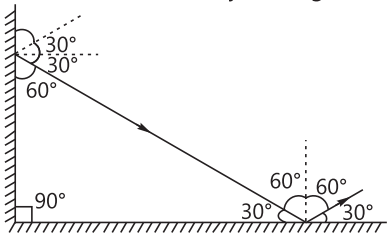
116. (a) Physical change
1. Hammering of red hot iron to make flat sheet.
2. Formation of ice by cooling water.
3. Vaporisation of sea water.

117. (c) Chemical change
1. Burning of candle wax.
2. Passing of CO_2 gas through lime water.

118. (b) The friction between the tyres of automobile and the road determines maximum acceleration of automobile and its minimum stopping distance. Driving, a car on a wet road is difficult because water decreases the friction between the tyres and the road.

119. (i) Plane mirror always forms virtual image of the same size of a real object.
(ii) Concave mirror forms virtual and enlarged image of a real object placed very near to it, so it is used by dentists to examine teeth.
(iii) Convex mirror always forms virtual image of smaller size of a real object.
(iv) Concave lens always forms virtual image of smaller size of a real object and it is thinner in the middle.
(v) Convex lens forms virtual and enlarged image of a real object near to it, so it is used as reading glass.

120. (c) This can be understood by looking at the following fig.



121. (b) Atmospheric pressure in the centre of a tropical cyclone is very low because of rising warm air.

122. (b) In the given situation if two copper plates are moved further apart from each other then smaller amount of copper will be deposited on the plate connected to negative electrode as ions takes more time to deposit because of large distance.

123. (a) Under similar conditions an electromagnet having more number of turn of the wire wrapped will have greater strength.

124. (b) Magnetic field lines around a current carrying straight conductor are concentric circles (as shown in figure 1) so iron fillings settle as circles (as shown in figure 2) in the situation given.

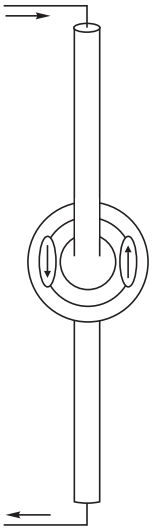


Figure 1

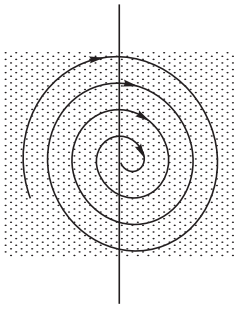
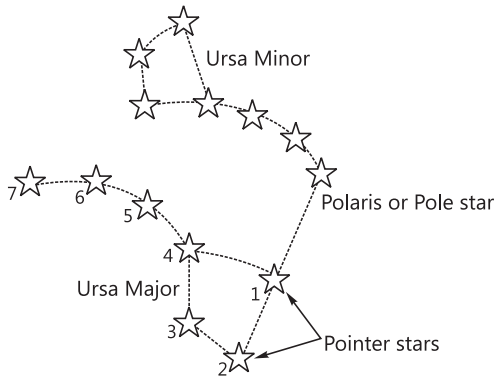


Figure 2

125. (c) Look straight in the direction of the stars situated at the far end of the ladle in Ursa Major (stars 1 and 2). The star of medium brightness in the direction of the above stars is the pole star (as shown in figure). The stars 1 and 2 in Ursa Major which point in the direction of the pole star are called pointer stars.



Relative positions of Ursa Major and Ursa Minor

126. (a) As we know,

$$\frac{C-0}{100-0}=\frac{F-32}{212-32}$$

$$\Rightarrow \quad \frac{25-0}{100-0}=\frac{F-32}{180}$$

$$\Rightarrow \quad F=77^\circ F$$

127. (a) When there is lightning and you are in jungle, go under a canopy of small trees and bushes. If you are out in the open, crouch on your feet, do not stand up or lie on the ground.

128. (a) Slope of distance time graph gives speed and in the given situation slope of distance time graph is constant so, speed must be constant.

129. (a) As we know

$$\text{Average speed}=\frac{\text{Total distance covered}}{\text{Time taken}}$$

$$\text{Average speed}_{(t=4 \text{ to } =20 \text{ min})}$$

$$=\frac{15-5}{20-4}=\frac{10}{16}\text{ km/min}$$

130. (c) We know pressure $=\frac{\text{Thrust}}{\text{Area}}$ so, cuboid will exert maximum pressure when it is kept in such a way that its contact area is minimum.

131. (b) Pen $\rightarrow$ ₹ 5

Pencil $\rightarrow$ ₹ 1

Pen : Pencil $= 2:3$

$$\text{Pen} = 2x, \text{ Pencil} = 3x$$

Total cost of Pen $\rightarrow 10x$ and Pencils $\rightarrow 3x$

$$10x\times\frac{112}{100}+3x\times\frac{110}{120}=725$$

$$1120x+330x=725\times100$$

$$1450x=725\times100$$

$$x=50$$

132. (c) Let initial tax = ₹ 100

After decreased by 15% new tax = ₹ 85

Consumption increased by 10%, then new revenue

$$=85\times\frac{110}{100}=₹\,93.50$$

Then, per cent decrease in revenue $= 6.5\%$

133. (d) $3^{1001}\times7^{1002}\times13^{1003}$

Cyclicity of 3 and 7 are 4

i.e., $3^1\times7^2\times3^3$

$\Rightarrow \quad 3\times9\times7$

$\Rightarrow \quad 9$

134. (c) $6<\sqrt{x}<7$

i.e., number lies between 36 and 49.

i.e., cube roots of a number lie between 3 and 4.

135. (b) Sum of interior angle $=(n-2)\times180^\circ$

One angle of regular polygon $=\frac{(n-2)\times180^\circ}{n}$

i.e., $=\frac{(n-2)\times180^\circ}{n}=165^\circ$

$$180^\circ n-360^\circ=165^\circ n$$

$$180^\circ n-165^\circ n=360^\circ$$

$$15^\circ n=360^\circ$$

$$n=24$$

136. (b) $x\propto\frac{1}{y}$

$$x=\frac{k}{y}$$

$$xy=k$$

i.e., $x_1y_1=x_2y_2$

Let $x_1=100,\ y_1=100$

$x_2=120,\ y_2=?$

Now, $100\times100=120\times y_2$

$$y_2=\frac{100\times100}{120}=83\frac{40}{120}=83\frac{1}{3}$$

i.e., y decreases by $16\frac{2}{3}\%$

137. (c)

138. (c) $2^{48}-1=(2^{48}+1)(2^{24}-1)$

$$=(2^{24}+1)(2^{12}+1)(2^{12}-1)$$

$$=(2^{24}+1)(2^{12}+1)(2^6+1)(2^6-1)$$

$$=(2^{24}+1)(2^{12}+1)(2^6+1)(2^3+1)(2^3-1)$$

$$=(2^{24}+1)(2^{12}+1)(2^6+1)(9)(7)$$

i.e., x have two factors between 5 and 10.

139. (d) $abcd$ and $dcba$ are four digit numbers

Here, $abcd = 1000a+100b+10c+d$

$$dcba=1000d+100c+10b+a$$

i.e., sum $=1001a+110\ \ b+110c+1001d$

$$=1001(a+d)+110(b+c)$$

$$=1001\times7+110\times7$$

$$=7(1001+110)=7\times1111=7777$$

i.e., number is divisible by 7, 11, 101, but not divisible by 111.

140. (d) Let total number of herd $= x$

$\frac{x}{2}$ are grazing in the field

$\frac{3}{4}\left(\frac{x}{2}\right)$ are playing

i.e., $\frac{1}{4}\left(\frac{x}{2}\right)=9$ are drinking water

i.e., $x=9\times8=72$

i.e., number of deers which are grazing in the field = 36

and number of deers which are playing = 27

difference = 9

i.e., multiple of 9

141. (b) Let $x + y = 180°$

x is a smaller angle

$x = 4(90° - x)$

$x = 360° - 4x$

$5x = 360°$

$x = 72°$

Thus, $y = 180° - 72° = 108°$

Now, difference $= 108° - 72° = 36°$

142. (c) $A : B : C : D = 3 : 7 : 6 : 4$

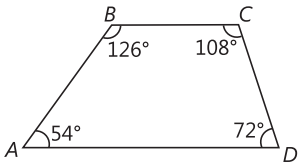
$3x + 7x + 6x + 4x = 360°$

$20x = 360°$

$x = 18°$

$\angle A = 54°, \angle B = 126°, \angle C = 108°, \angle D = 72°$

i.e., $ABCD$ is a trapezium.



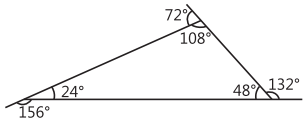
143. (d) Angle $2x + 4x + 9x = 180°$

$15x = 180° \Rightarrow x = 12°$

i.e., $24°, 48°, 108°$

Exterior angles one, $156°, 132°, 72°$

Difference between smallest angles $\rightarrow 132° - 72° = 60°$

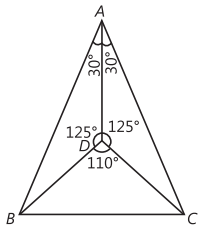


144. (d) $\Delta ABD = \Delta ACD$

$\angle CAD = \angle BAD = 30°$

$\angle ADB = \angle ADC = \frac{1}{2}(360° - 110°) = 125°$

$\angle ABD = 180° - 155° = 25°$



145. (b) $AD = \sqrt{9 - y^2}$

In ΔABD $\quad 16 = x^2 + y^2 + 2xy + 9 - y^2$

$7 = x^2 + 2xy$ ...(i)

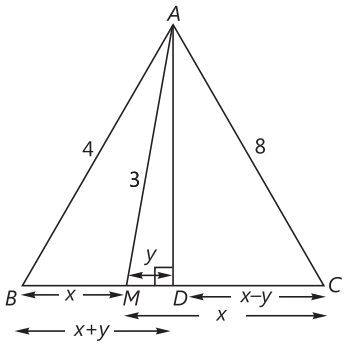
In ΔADC $\quad 64 = (x - y)^2 + (9 - y^2)$

$55 = x^2 - 2xy$ ...(ii)

On adding eqs. (i) and (ii), we get

$62 = 2x^2 \qquad x^2 = 31$

$x = \sqrt{31} \qquad BC = 2x = 2\sqrt{31}$ cm



146. (c) $C = 2\pi r$

$A = \pi r^2$

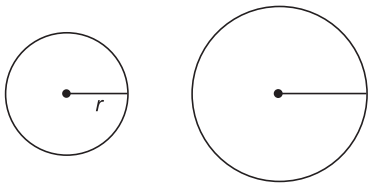
$C' = x \,.\, C = x2\pi r$

$A' = 2A = 2\pi r^2$

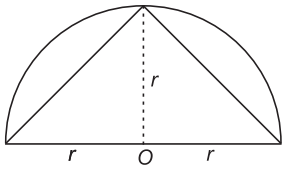
Since, area doubles, the radius should be $\sqrt{2}$ times.

i.e., $r' = \sqrt{2}r$ Hence, $C' = \sqrt{2}(2\pi r)$

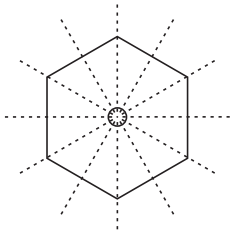
So, $x = \sqrt{2}$



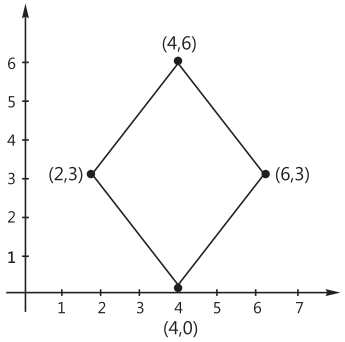
147. (c) $\frac{1}{2} \times (2r) \times r = \frac{2r^2}{2} = r^2$



148. (a) $x = \frac{360°}{12} = 30°$



149. (c) Rhombus



150. (c) 21, 39, 39, 45, 54, 54, 56, 56, 56, 77, 84, 84

$$\text{Mode} = 56$$

$$\text{Median} = \frac{54 + 56}{2} = 55$$

$$\text{Range} = 84 - 21 = 63$$

$$\text{Mean} = \frac{56 + 55 + 63}{3} = \frac{174}{3} = 58$$

151. (d) Dhangadeva built Kandariya Mahadeva temple, Rajarajadeva built Rajarajeshvara temple devoted to Lord Shiva, Rajendra I built the city of Gangaikondacholapuram to commomerate victory over Ganga dynasty and Babur followed Chahar Bagh strategy for gardens.

153. (a) Alvars saints of South India were followers of Lord Vishnu. Nayanars were worshippers of Lord Shiva.

154. (a) During Mughal period Bakhshi was responsible for paying salaries to soldiers. Faujdar was army general. Sadr-us-Sadar was responsible to take care of religious behaviour of people. Kotwal look after the law and order of city.

156. (b) Kathak word evolved from the word "Katha" (Story tellers), Kathak later developed by Bhakti Saint. Nawab Wajid Ali Shah of Awadh patronised Kathak and later Mughals.

157. (d) Kanchipuram was the capital of Pallavas nearly 1400 yr ago. Later Masulipatnam emerged as an important town during Narsimhavarman. Hampi was the capital of Vijayanagara kingdom during Sultanate period. Bombay emerged as an important town during colonial period.

158. (d) Garh was divided into Chaurasi, into Barhots and later into smallest unit known as Village.

159. (b) Raziya was the only woman Sultan during Sultanate period.

160. (d) James Mill divided Indian history into Hindu, Muslim and British.

162. (c) Tagore felt that childhood ought to be a time of self-learning, outside the rigid and restricting discipline of the schooling system set up by the British. Tagore wanted to combine elements of modern western civilization with what he saw as the best within Indian tradition.

163. (b) Rashtriya Swayamsevak Sangh-1920

All India Muslim League-1906

Indian Association-1870

Indian National Gongress-1885

168. (d) Westerlies are stronger in Southern hemisphere due to clear water bodies. Winds moves very fast in absence of hurdles. Northern hemisphere is occupied by landmass.

169. (d) Diagram represent spring tides.

170. (d) National parks are correctly matched with their respective region.

172. (b) Lorraine area in France is significant for coal fields.

173. (a) Indianapolis lies in the United States of America.

176. (d) Shifting cultivation = Rengmas

Pastoralism = Kirghiz

Hunters and food Gatherers = Pygmies

Hunters – Eskimos

177. (c)

	Region	Grasslands
1.	Argentina	Pampas
2.	North America	Prarie
3.	South Africa	Velds
4.	Central Asia	Steppes
5.	Australia	Downs

179. (d) Concept is evaporation *i.e.*, upward movement.

❐❐