

NTSE

National Talent Search Examination

MAT + SAT

[Stage I]

Time : 180 Min

Max. Marks : 180

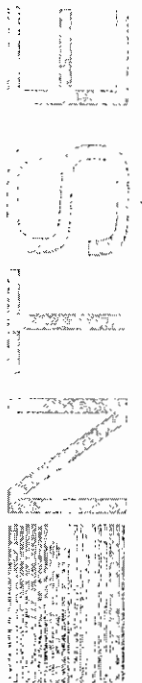
Read the following instructions carefully.

1. Answers are to be given on a separate answer sheet. Use only HB Pencil.
2. Write your Roll No. very clearly (only one digit in one block) on this booklet and on the answer sheet.
3. This test consists of 180 questions of one mark each. All the questions are compulsory.
4. Answer to each question by filling the correct alternative among the four choices on the answer sheet.

Example

	Q. No.	Alternatives			
Correct way	1	①	②	●	④
	Q. No.	Alternatives			
Wrong way	1	⊗	②	③	④

5. Now, turn to the next page and start answering the questions.



Paper I : Mental Ability Test

Directions (Q. Nos. 1-5) *In each of the following question, complete the given series by choosing correct alternative.*

1. 462, 420, 380, (?), 306
 a. 344 b. 342 c. 340 d. 349
2. 6, 13, 28, (?)
 a. 58 b. 56 c. 59 d. 41
3. 0.5, 0.55, 0.65, 0.80, (?)
 a. 1 b. 2 c. 3 d. 0.95
4. 729, 512, 343, 216, 125, (?), 27, 8
 a. 36 b. 120 c. 65 d. 64
5. 2, 4, 3, 9, 4, 16, 5, (?), 6, 36, 7, 49
 a. 20 b. 25 c. 26 d. 18

Directions (Q. Nos. 6-8) *Choose the word from the given alternatives, which bears the same relationship to the third word as the first two bears?*

6. Professor : Lecture :: Doctor : ?
 a. Disease b. Patient c. Hospital d. Medicine
7. Ship : Sea :: Camel : ?
 a. Desert b. Land c. Mountain d. Forest
8. Girl : Beautiful :: Boy : ?
 a. Heroic b. Handsome c. Smart d. Courageous

Directions (Q. Nos. 9-12) *Find out the odd one from the given alternative.*

9. a. Pink b. Green c. Yellow d. Blue
10. a. Goat b. Dog c. Camel d. Cow
11. a. X-ray b. Telephone c. Computer d. Radio
12. a. Arrogance b. Gentle c. Wise d. Honest
13. In a class 'Atul' ranks 15th from the top while Banti ranks 18th from the bottom. If Sachin ranks 16th from Atul and is immediately preceding Banti, then how many students?
 a. 49 b. 42 c. 40 d. 39
14. Mohan is elder than Sohan. Raju is elder than Ravi but younger than Sohan. Deepak and Ravi are younger than Raju, who is youngest among them?
 a. Ravi b. Deepak c. Sohan d. Ravi or Deepak

Directions (Q. Nos. 15-17) *Insert the missing number in the following questions.*

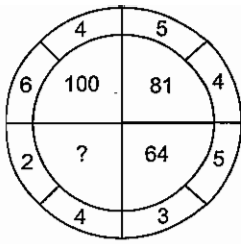
15.

101	43
38	
35	15

48	34
?	
56	184

 a. 127 b. 142 c. 158 d. 198

16.



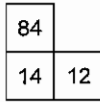
a. 64

b. 36

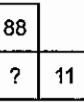
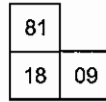
c. 16

d. 72

17.



a. 12



b. 16

c. 32

d. 20

Directions (Q. Nos. 18-20)

18.

1. Letters 2. Words 3. Paragraphs 4. Story 5. Sentences

a. (1), (2), (4), (5), (3) b. (1), (2), (5), (4), (3) c. (1), (2), (4), (5), (3) d. (1), (2), (5), (3), (4)

19.

1. Grass 2. Milk 3. Cow 4. Butter 5. Curd

a. (3), (2), (1), (5), (4) b. (1), (5), (4), (2), (3) c. (1), (3), (2), (5), (4) d. (5), (4), (3), (2), (1)

20.

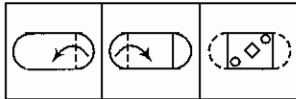
1. Arrest 2. Prison 3. Crime 4. Punishment 5. Judgement

a. (3), (1), (5), (4), (2) b. (3), (1), (5), (2), (4) c. (3), (1), (2), (4), (5) d. (4), (3), (2), (1), (5)

Directions (Q. Nos. 21-23) Select the answer from the given alternatives which would most suitable when paper is unfolded.

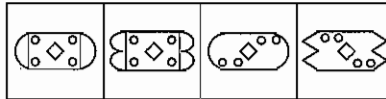
21.

Problem Figures



(x) (y) (z)

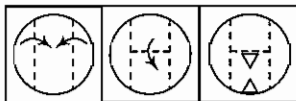
Answers Figures



a. b. c. d.

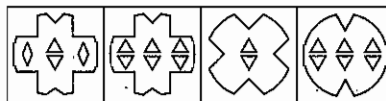
22.

Problem Figures



(x) (y) (z)

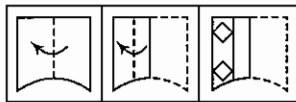
Answer Figures



a. b. c. d.

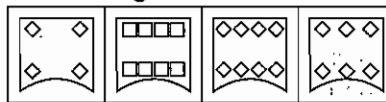
23.

Problem Figures



(x) (y) (z)

Answer Figures

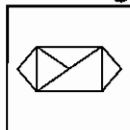


a. b. c. d.

Directions (Q. Nos. 24-25) Find out the correct mirror image from given alternatives.

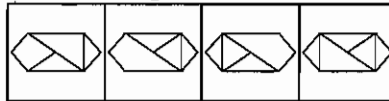
24.

Problem Figure



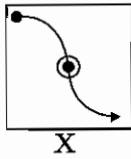
X

Answer Figures

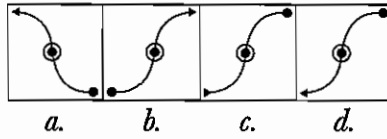


a. b. c. d.

25. Problem Figure

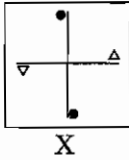


Answer Figures

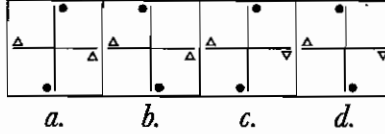


Directions (Q. Nos. 26-27) Find out the correct water image from given alternatives.

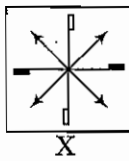
26. Problem Figure



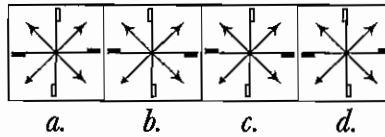
Answer Figures



27. Problem Figure

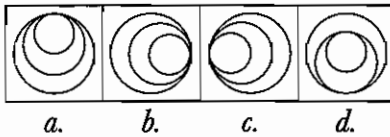


Answer Figures

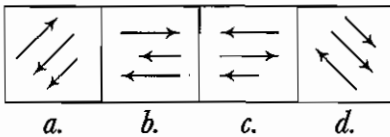


Directions (Q. Nos. 28-30) Find out the odd figure from the given alternatives.

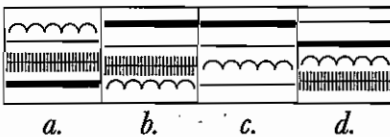
28.



29.

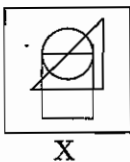


30.

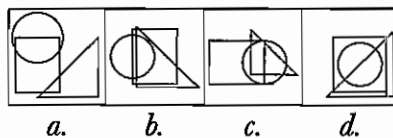


Directions (Q. Nos. 31-33) Find the correct alternative in the answer figures the relation between the problem figures (X) and answer (a, b, c, d) figure must be same.

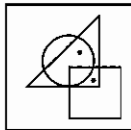
31. Problem Figure



Answer Figures

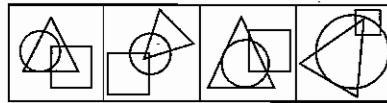


32. Problem Figure



X

Answer Figures



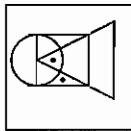
a.

b.

c.

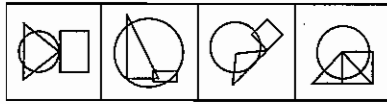
d.

33. Problem Figure



X

Answer Figures



a.

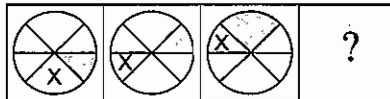
b.

c.

d.

Directions (Q. Nos. 34-36) Find out the answer figure from given alternatives which continues the problem figure

34. Problem Figures



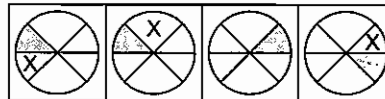
(A)

(B)

(C)

(D)

Answer Figures



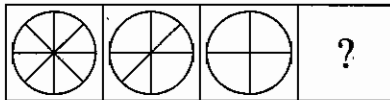
a.

b.

c.

d.

35. Problem Figures



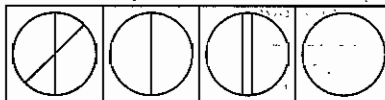
(A)

(B)

(C)

(D)

Answer Figures



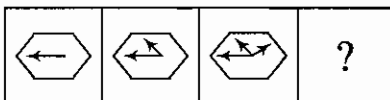
a.

b.

c.

d.

36. Problem Figures



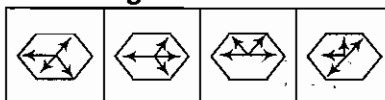
(A)

(B)

(C)

(D)

Answer Figures



a.

b.

c.

d.

- 37.** In a team, the captain took $\frac{1}{4}$ th part of cake and the remaining was divided equally among the others. If the captain had twice the shares of any other members. How many members are there in the team?

a. 6

b. 7

c. 8

d. 9

- 38.** Vishal is 17th from both ends of row of boys, how many boys are there in the row?

a. 34

b. 35

c. 33

d. 48

- 39.** Sum of ₹ 800 divide between A, B and C in such a way A get twice from B and C, find out the amount of A?

a. 400

b. 350

c. 500

d. 450

Directions (Q. Nos. 40-42) Read the following information carefully and answer the question given below.

If '+' means '×', '×' means '+', '-' means '÷', '÷' means '-'.

- 40.** $5 + 3 \times 20 - 10 \div 5$

a. 12

b. 14

c. 18

d. 16

41. $24 - 2 + 12 \times 8 \div 16$

a. 144

b. 138

c. 136

d. 17

42. $171 \div 36 + 15 - 5 \times 25$

a. 58

b. 78

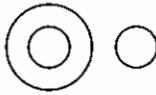
c. 68

d. 88

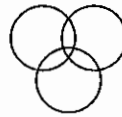
Directions (Q. Nos. 43-46) You are choose from the four Venn-diagrams that best illustrates the relationship among three given classes or groups in the questions.



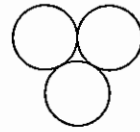
a.



b.



c.



d.

43. Birds, Peacock, Parrot

44. Animal, Whale, Bottle

45. Cap, Helicopter, Calculator

46. Messages, Contacts, Mobile

Directions (Q. Nos. 47-50) Read the following information carefully and give the answer below.

There are six family members. Mona is the daughter of Lata. Monu is the nephew of Veeru. Veeru and Rajesh are sons of Surendra. Rajesh is the husband of Lata.

47. How Mona is related to Monu?

a. Mother

b. Sister

c. Father

d. Grandfather

48. How Lata is related to Monu?

a. Sister

b. Brother

c. Mother

d. Grandmother

49. How Surendra is related to Lata?

a. Father-in-law

b. Mother-in-law

c. Father

d. Grandmother

50. What is the ratio of males and females in the family?

a. 6 : 8

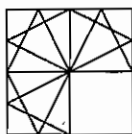
b. 2 : 4

c. 3 : 3

d. 4 : 2

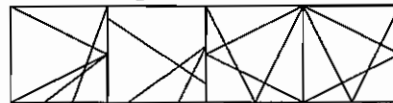
Directions (Q. Nos. 51-53) Find the answer figure which completes the problem figure from the given alternatives.

51. **Problem Figures**



X

Answer Figures



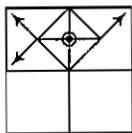
a.

b.

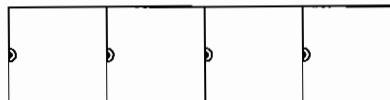
c.

d.

52.



X



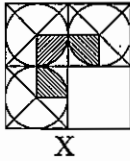
a.

b.

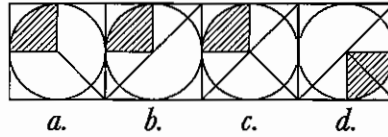
c.

d.

53. Problem Figure

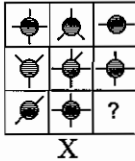


Answer Figures

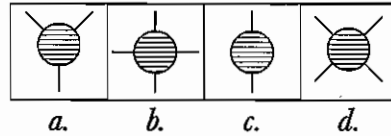


Directions (Q. Nos. 54–56) Find the answer from the option which completes the figure matrix.

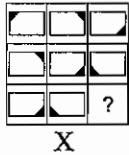
54. Problem Figure



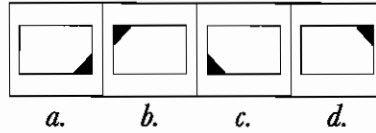
Answer Figures



55. Problem Figure



Answer Figures



56. Problem Figure

7	11	13
17	19	23
29	31	?

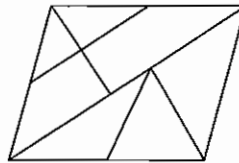
X

Answer Figures

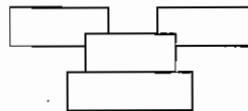
30	37	35	33
----	----	----	----

a. b. c. d.

- 57.** If 21st July, 1987 was Friday, what would be day on 31st March of 1988?
 a. Sunday b. Tuesday c. Wednesday d. Friday
- 58.** Today is Friday, what was the day before 71 days?
 a. Wednesday b. Thursday c. Tuesday d. Saturday
- 59.** How many triangles in the given figure?



- a. 10 b. 12 c. 11 d. 9
- 60.** How many rectangles in the figure below?



- a. 7 b. 2 c. 4 d. 3

Directions (Q. Nos. 61-63) Read the following information carefully and answer the questions given below.

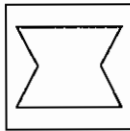
There are six flats on 2nd floor of a building. Names of flats, facing North is R, J and Q and facing South is Y, Z and A, not necessary in the same order.

- Q is opposite to Z.
- R is second to right of Q.
- A is opposite to J.

61. Which flat is neighbour of Y flat?
 a. A b. Z c. J d. Q
62. Which flat is the neighbour of Q flat?
 a. O b. J c. R d. A
63. Which group shows the South facing flats but in sequence?
 a. AYZ b. ZYA c. ZAY d. Cannot be determined

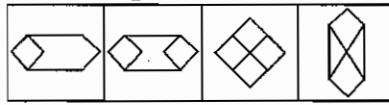
Directions (Q. Nos. 64-66) Trace out the correct alternative, in which (X) figure is embedded.

64. Problem Figure



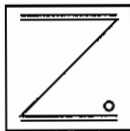
X

Answer Figures



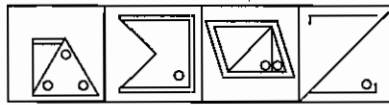
a. b. c. d.

65. Problem Figure



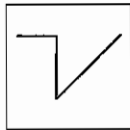
X

Answer Figures



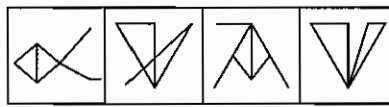
a. b. c. d.

66. Problem Figure



X

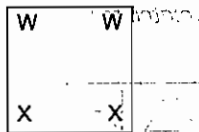
Answer Figures



a. b. c. d.

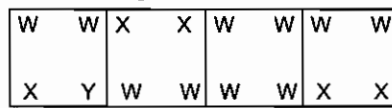
Directions (Q. Nos. 67-69) Trace out the correct alternative, which is exactly similar to figures 'X'?

67. Problem Figure



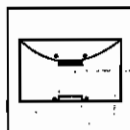
X

Answer Figures



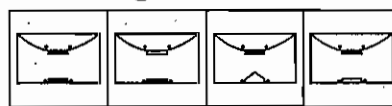
a. b. c. d.

68. Problem Figure



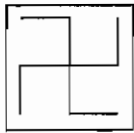
X

Answer Figures



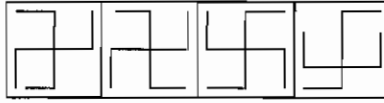
a. b. c. d.

69. Problem Figure



X

Answer Figures



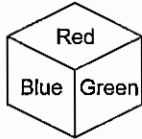
a. b. c. d.

70. How many 2s in the series which is preceded by 5 and followed by 7?

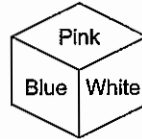
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- a. One b. Two c. Three d. None of these

71. All the sides of dice are painted with paints green, blue, red, pink, white and yellow. From the given painted dices, find out which colour will be the opposite to blue?



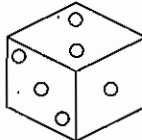
(i)



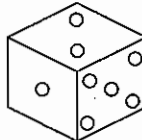
(ii)

- a. Yellow b. Pink c. White d. Blue

72. How many dots will be on the opposite side of three dots?



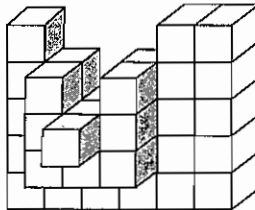
(i)



(ii)

- a. Four b. Five c. Two d. One

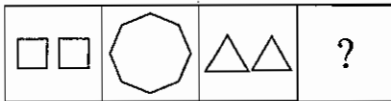
73. Count the number of cubes in the given figure.



- a. 25 b. 35 c. 32 d. 34

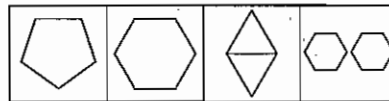
Direction (Q. Nos. 74-76) From the answer figure, find the relative figure to 'C' as A related to B.

74. Problem Figures



(A) (B) (C) (D)

Answer Figures



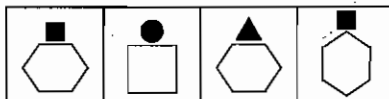
a. b. c. d.

75. Problem Figures



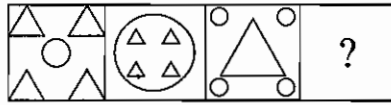
(A) (B) (C) (D)

Answer Figures



a. b. c. d.

76.

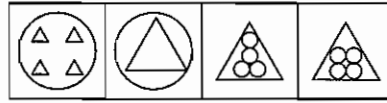
Problem Figure

(A)

(B)

(C)

(D)

Answer Figures

a.

b.

c.

d.

Directions (Q. Nos. 77-80) *Arrange the given words in an alphabetical order and choose the one that comes first?*

77. a. Artist b. Artificial c. Astrology d. Ascent
 78. a. Opportunity b. Opposite c. Optics d. Option
 79. a. Inspect b. Install c. Insist d. Insulin
 80. a. Magical b. Media c. Machine d. Magnet

Directions (Q. Nos. 81-82) *Find the word which can be formed by the letters of given words.*

81. RECREATION
 a. ACTION b. REFER c. TORN d. RATION
 82. QUESTIONNAIRE
 a. QUINATE b. QUEUE c. QUESTOR d. QUERIES
 83. How many such pairs of letters are there in the word 'MOTOROLA' each is which has as many letters in same sequence between them in the word as in the English alphabet?
 a. Two b. Three c. Four d. Five

Directions (Q. Nos. 84-87) *Read the following information and answer the question given below.*

- There are five friends named Mohan, Sohan, Vishal, Sonu and Rajesh.
- Rajesh lives to the North of Sonu, who lives to the West of Vishal.
- Sohan lives North-East of Mohan, who lives to the West of Sonu.
- Among the five friends two live in same place.

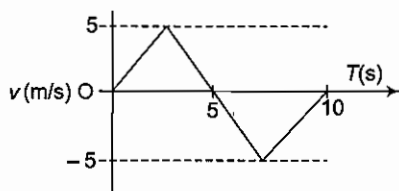
84. In which direction is Vishal lives in respect to Mohan?
 a. East b. West c. North d. South
 85. What is the position of Rajesh with respect to Vishal?
 a. North-West b. South-East c. North-East d. South-West
 86. Who are the two friends live at same place?
 a. Rajesh and Sonu b. Sohan and Vishal c. Mohan and Vishal d. Sohan and Rajesh
 87. In which direction Sohan lives in respect to Sonu?
 a. West b. East c. North d. South

Directions (Q. Nos. 88-90) *In each of the following questions, arrange the given words in the sequence in which they occur in the dictionary and then choose the correct sequence?*

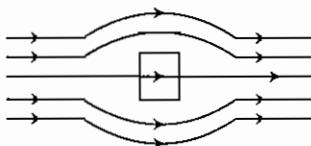
88. 1. Cloth 2. Cinema 3. Chronic 4. Christmas 5. Create
 a. (4), (3), (2), (1), (5) b. (1), (2), (3), (4), (5) c. (4), (2), (3), (5), (1) d. (4), (2), (3), (5), (1)
 89. 1. Dialogue 2. Diagram 3. Diameter 4. Diagnose 5. Dial
 a. (4), (2), (5), (1), (3) b. (2), (4), (5), (1), (3) c. (1), (2), (4), (5), (3) d. (1), (2), (3), (4), (5)
 90. 1. Enlock 2. Enrich 3. Energetic 4. Encounter 5. English
 a. (1), (2), (3), (4), (5) b. (4), (3), (5), (1), (2) c. (1), (3), (2), (4), (5) d. (5), (4), (1), (2), (3)

Paper II : Scholastic Aptitude Test

91. The $v-t$ plot of a moving object is shown in the figure. The average velocity of the object during the first 10 s is



- a. zero b. 2.5 m/s c. 5 m/s d. 2 m/s
92. A satellite revolves around the Earth in elliptical orbit, its speed is
 a. same at all points on the orbit b. greatest when it is farthest from the Earth
 c. greatest when it is closest to the Earth d. All of these
93. A gas is enclosed in a container which is then placed on a fast moving train. The temperature of the gas
 a. rises b. falls
 c. remains unchanged d. becomes unsteady
94. SONAR is based on the principle of
 a. echo b. resonance c. vibration d. None of these
95. A person standing in front of a mirror finds his image thinner but with normal height. The mirror is
 a. concave and spherical b. convex and spherical
 c. convex and cylindrical with vertical axis d. convex and cylindrical with horizontal axis
96. **Assertion (A)** Sound can reach from one place to another due to air.
Reason (R) mechanical wave requires a medium for its propagation.
 a. If both A and B are true and R is the correct explanation of A
 b. If both A and B are true, but R is not the correct explanation of A
 c. If A is true, but R is false
 d. If both A and R are false
97. One Tesla is equal to
 a. 10^7 gauss b. 10^{-4} gauss c. 10^4 gauss d. 10^{-8} gauss
98. A magnetic needle kept in a non-uniform magnetic field experiences
 a. a force and torque b. a force but not a torque
 c. a torque but not a force d. Neither a torque nor a force
99. The given figure represents a material which is



- a. paramagnetic b. diamagnetic c. ferromagnetic d. None of these

100. To get three images of a single object, one should have two plane mirrors at an angle of
a. 30° *b.* 60° *c.* 90° *d.* 150°

101. The focal length of a normal eye lens is about
a. 1 mm *b.* 2 cm *c.* 25 cm *d.* 1 m

102. A glass jug is to be made that does not break when boiling water is poured onto it. Four possibilities are

- I. Using thick glass.
- II. Using thin glass.
- III. Using glass that expands greatly when heated.
- IV. Using glass that expands little when heated.

Which two choices would be best?

- a.* I and III *b.* I and IV *c.* II and III *d.* II and IV

103. A compound 'X' is an allotrope of an element of atomic number 6. Compound 'X' is greyish-black in colour. By nature, it is opaque and it is used in making 'pencil leads' and black paints. Identify the compound 'X'.

- a.* Lead *b.* Carbon *c.* Graphite *d.* Fullerene

104. Consider the following statements.

- I. Chlor-alkali process is the process of electrolysis of NaCl solution.
- II. During electrolysis, Cl gas is produced at anode and H₂ gas is produced at cathode.

Which of the above statement(s) is/are correct?

- a.* Only I *b.* Only II *c.* Both I and II *d.* Neither I nor II

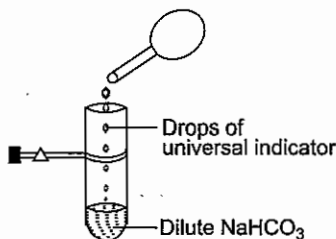
105. Match the following

List I	List II
A. $K_2O(s) + H_2O(l) \longrightarrow$	1. 2NaOH
B. $Na_2O(s) + H_2O(l) \longrightarrow$	2. 2KOH
C. $2Al(s) + 6 HCl (aq) \longrightarrow$	3. $2AlCl_3(aq) + 3H_2(g)$

Codes

- a.* A B C *b.* A B C *c.* A B C *d.* A B C
- a.* 2 1 3 *b.* 3 1 2 *c.* 2 3 1 *d.* 1 2 3

106. Varsha adds a few drop of the universal indicator solution to a dilute solution of NaHCO₃ taken in a test-tube. She observed colour.



- a.* green *b.* mustard *c.* yellow *d.* blue

107. The element with atomic number 9, 17, 35, 53 and 85 are all
a. noble gases *b.* heavy metals *c.* light metals *d.* halogens

108. Which of these methods is used to extract alcohol from a mixture of alcohol and water?
a. Distillation *b.* Crystallisation *c.* Oxidation *d.* Bleaching

109. All of the following elements are metalloids except
a. antimony *b.* silicon *c.* germanium *d.* gallium

110. Match the following

List I	List II
A. Alkene	1. C_nH_{2n+2}
B. Halo alkanes	2. C_nH_{2n}
C. Alkane	3. $C_nH_{2n+1}-X$

Codes

- | | | | |
|-----------------|-----------------|-----------------|-----------------|
| A B C | A B C | A B C | A B C |
| <i>a.</i> 2 3 1 | <i>b.</i> 1 2 3 | <i>c.</i> 3 2 1 | <i>d.</i> 2 1 3 |

111. Which type of solution does not exhibit Tyndall effect?

- a.* Heterogeneous suspension *b.* True solution
c. Colloidal solution *d.* None of these

112. On burning an element in air, forms an oxide. On dissolving this oxide in H_2O it forms an oxyacid. This oxide is a very good dehydrating agent and on reacting with caustic soda, it forms salt but no salt-formation takes place with H_2SO_4 . The oxyacid of the element is

- a.* hypophosphorus acid *b.* boric acid
c. phosphoric acid *d.* phosphorus acid

113. Consider the following statemets

- I. Pyrolusite is the ore of zinc.
 II. Calamine is the ore of manganese.

Which of the above statement(s) is/are correct?

- a.* Only I *b.* Only II *c.* Both I and II *d.* Neither I nor II

114. When hydrogen and oxygen combined chemically in a fixed ratio of 1 : 8 by weight, X is obtained. X

- a.* can be separated into its constituent by physical methods.
b. has properties quite different from hydrogen and oxygen
c. has fixed melting point
d. is homogeneous

115. Females need more dietary iron than males because

- a.* they lose iron during menstruation *b.* they have less bone marrow
c. they have large volume of blood *d.* they are able to absorb iron less

116. The conversion of the ammonia into urea occurs mainly in

- a.* kidney *b.* lungs *c.* liver *d.* intestine

117. Consider the following statements about clone.

- I. Cloning was successfully done, for the first time by Scottish doctor Ian Wilmut and his team.
 II. This clone was a sheep named Dolly born on 5th July 1996.

Which of the statement(s) given above is/are correct?

- a.* Only I *b.* Only II *c.* Both I and II *d.* None of these

118. In the following, best methods of determining the age of tree is to

- a.* measure its height
b. count the number of leaves
c. measure its diameter
d. count the number of annual rings in the main stem at the base

119. Match the following

List I (Common Name)	List II (Scientific Name)
A. Silk worm	1. <i>Brassica campestris</i>
B. Mustard	2. <i>Mangifera indica</i>
C. Mango	3. <i>Papaver somniferum</i>
D. Opium	4. <i>Bombyx mori</i>

Codes

- | | | | |
|------------|------------|------------|------------|
| A B C D | A B C D | A B C D | A B C D |
| a. 4 1 2 3 | b. 1 2 3 4 | c. 2 3 4 1 | d. 3 4 1 2 |

120. Vermicomposting is done by using which organism?

- a. Species of earthworm b. Amoeba
c. Frog d. Lizard

121. Consider the following vitamins

- I. Retinol II. Calciferol III. Tocopherol IV. Riboflavin

Which of above vitamin(s) is/are

- a. I, II and III b. I and II c. II and IV d. I and III

122. Which of the following 'analogous organs' contains?

- a. Different embryonic origin and perform different functions
b. Different embryonic origin but perform similar functions
c. Common embryonic origin and perform dissimilar functions
d. None of the above

123. The bacteria present in human intestine which help in synthesis of vitamin-B complex is

- a. *Lactobacillus* b. *Rhizobium* c. *Azetobactor* d. *E. coli*

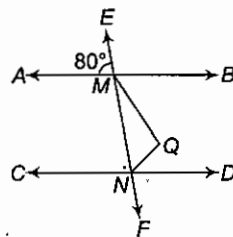
124. The carbohydrate synthesised in the leaves are transported through sieve tubes most commonly in the form of

- a. glucose b. triose sugar c. sucrose d. soluble starch

125. Which of the following is used for determining the rate of transpiration in plants?

- a. Auxanometer b. Porometer c. Potometer d. Tensiometer

126. If AB is parallel to CD, EF intersects them at M and N. The bisectors of $\angle BMN$ and $\angle MND$ meet at Q. If $\angle AME = 80^\circ$, then $\angle MQN$ is



- a. 90° b. 80° c. 60° d. 70°

127. The sum of two numbers is 15. If the sum of their reciprocals is $\frac{3}{10}$, then the numbers are

- a. 6, 9 b. 10, 5 c. 8, 7 d. 7, 8

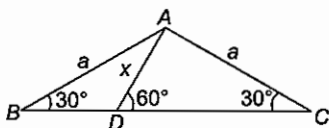
128. The value of x satisfying the equation $\sqrt{x+4} = x-2$ is

- a. 0, 5 b. 0, 4 c. 5 d. None of these

129. If from a circular sheet of paper of radius 10 cm, a sector of area 40% is removed and the remaining is used to make a conical surface, then the angle at the vertex will be

a. $\sin^{-1}\left(\frac{4}{5}\right)$ b. $\sin^{-1}\left(\frac{3}{5}\right)$ c. $2 \sin^{-1}\left(\frac{4}{5}\right)$ d. $2 \sin^{-1}\left(\frac{3}{5}\right)$

130. In the given figure, what is the value of x ?

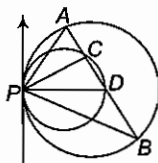


a. $\frac{a}{3}$ b. $\frac{a}{2}$ c. $\frac{a}{\sqrt{3}}$ d. $\frac{a}{\sqrt{2}}$

131. The exterior angle of a regular polygon is one-third of its interior angle. The number of sides of polygon is

a. 2 b. 4 c. 6 d. 8

132. Two circles touch internally at a point P and a chord AB of the larger circle intersects the other circle at C and D. Then, which statement is true?



a. $\angle CPA = \angle DPB$ b. $\angle CPA = \angle CPD$ c. $\angle DPC = \angle DPB$ d. $\angle APC = \angle DPB$

133. A, B and C are three sets of value of x .

A : 2, 3, 7, 1, 3, 2, 3

B : 7, 5, 9, 12, 5, 3, 8

C : 4, 4, 11, 7, 2, 3, 4

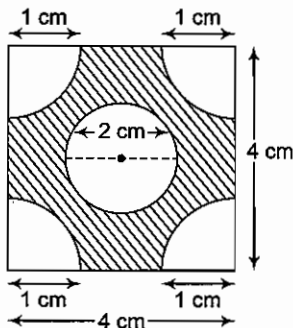
Select the correct statement from among the following.

a. Mean of A is equal to mode of C b. Mean of C is equal to median of B
c. Median of B is equal to mode of A d. Median, mean and mode of A are same

134. What should the seller mark the price of a watch purchased at ₹ 380, so that giving 5% discount, there is a profit of 25%?

a. ₹ 400 b. ₹ 450 c. ₹ 500 d. ₹ 600

135. The four corners are quadrants of circle and at the centre there is a circle. The area of shaded region in the given figure is



a. $(16 - \pi) \text{ cm}^2$ b. $(16 - 2\pi) \text{ cm}^2$ c. $(8 - 2\pi) \text{ cm}^2$ d. $(18 - 2\pi) \text{ cm}^2$

136. Mohan lies on 3 days out of the 7 days in a week, whereas Ram lies on 4 days out of 6 days of a week. If both of them were asked a question, what is the probability that both gave a true reply?
 a. $1/7$ b. $4/21$ c. $5/21$ d. $2/7$
137. The triangle formed by joining the vertices (3, 2), (5, -3) and (-5, 4) will be a
 a. acute triangle b. obtuse triangle c. right angled triangle d. isosceles triangle
138. The daily wages of a worker increase by 20% but the number of hours worked by them also dropped by 20%. If originally he was getting ₹ 200 per week, his wage per week now is
 a. ₹ 160 b. ₹ 192 c. ₹ 210 d. ₹ 198
139. A sum of ₹ 53 is divided among A, B and C in such a way that A gets ₹ 7 more than what B gets and B gets ₹ 8 more than what C gets the ratio of their shares is
 a. 25 : 18 : 10 b. 6 : 7 : 8 c. 12 : 14 : 9 d. 15 : 8 : 30
140. If $ab - b + 1 = 0$ and $bc - c + 1 = 0$, then what is value of $(a - ac)$?
 a. -1 b. 0 c. 1 d. 2
141. If three sides of a right angled triangle are integers in their lowest form, then one of its sides is always divisible by.
 a. 6 b. 5 c. 7 d. None of these
142. If $\sin x + \sin^2 x = 1$, then the value of $\cos^2 x + \cos^4 x$ is
 a. -1 b. 2 c. -2 d. 1
143. The angle of elevation of a cloud at a height h above the level of water in a lake is α and the angle of depression of its image in the lake is β . Then, the height of the cloud above the surface of the lake is
 a. $\frac{h(\cot \alpha - \cot \beta)}{\cot \alpha + \cot \beta}$ b. $\frac{h(\cot \alpha + \cot \beta)}{(\cot \alpha - \cot \beta)}$ c. $\frac{h \sin(\alpha - \beta)}{\sin(\alpha + \beta)}$ d. None of these
144. 2 men undertake to do a job for ₹ 1400. One can do it alone in 7 days and the other in 8 days. With the assistance of a boy they finish the work in 3 days. How should the money be divided?
 a. ₹ 600, ₹ 525, ₹ 275 b. ₹ 550, ₹ 500, ₹ 350 c. ₹ 650, ₹ 470, ₹ 280 d. None of these
145. A man borrows ₹ 4000 at 8% per annum on compound interest. At the end of every year he pays ₹ 1500 as part payment of loan and interest. How much does he still due to the bank after three such annual payments?
 a. ₹ 1799 b. ₹ 2000 c. ₹ 169.25 d. None of these
146. Election is a mechanism by which people can choose their representatives at regular intervals and change them, if they wish to do so.
 I. Everyone should have equality of vote and have equal value.
 II. The choice should be offered at regular intervals.
 III. Elections should be conducted in a free and fair manner.
 IV. The candidate preferred by the people should get elected.
 Which of the above is/are features of the democratic elections ?
 a. I and IV b. III and IV
 c. II, III and IV d. All of these
147. Who among the following is a part of the political executive at the centre?
 a. District Collector b. Secretary of the Ministry of Home Affairs
 c. Council of Ministers d. Director General of Police

- 148.** A government formed by an alliance of two or more political parties, usually when no single party enjoys majority support of the members in a legislature, known as
- Unitary Government
 - Federal Government
 - Coalition Government
 - Minority Government
- 149.** The Supreme Court of India can take up any dispute
- Between citizens of the country.
 - Between citizens and the government.
 - Between two or more state governments.
 - Between government at the union and state level.
- Which of the above statement(s) is/are correct?
- II and IV
 - I, II and III
 - III and IV
 - All of these
- 150.** Arrange the following in chronological order
- Cripps Plan
 - Cabinet Mission Plan
 - Mountbatten Plan
 - Wavell plan
- The proper chronological order should be
- I, II, III, IV
 - II, III, I, IV
 - III, IV, I, II
 - I, IV, II, III
- 151.** Which of the following Sultans opposed the interference of the Ulema in state affairs?
- Balban
 - Alauddin Khilji
 - Firoz Shah Tughlaq
 - Bahlol Lodi
- 152.** Consider the following events and arrange them chronologically
- Indigo Revolt
 - Santhal Rebellion
 - Deccan Riot
 - Mutiny of the sepoy
- The proper chronological order should be
- IV, III, I, III
 - IV, II, III, I
 - II, IV, III, I
 - II, IV, I, III
- 153.** The correct chronological sequence of the entry of the given Alien power in India is
- Indo-Greeks, Scythians, Kushanas, Hunas
 - Indo-Greeks, Hunas, Kushanas, Scythians
 - Scythians, Kushanas, Hunas, Indo-Greeks
 - Scythians, Kushanas, Indo-Greeks, Hunas
- 154.** 'Tripitakas' are the sacred book of the
- Hindus
 - Muslims
 - Jains
 - Buddhists
- 155.** Arrange the following events chronologically
- Non-cooperation Movement
 - Jallianwala Massacre
 - Khilafat Movement
 - Rowlatt Act
- The proper chronological order should be
- IV, II, III, I
 - II, III, IV, I
 - I, II, III, IV
 - IV, II, I, III
- 156.** Which of the following statements about the judiciary is incorrect?
- Every law passed by the Parliament needs approval of the Supreme Court
 - Judiciary can strike down a law, if it goes against the spirit of the Constitution
 - Judiciary is independent of the executive
 - Any citizen can approach the court, if his rights are violated

- 157.** An International organisation of Volunteers Campaign for Human Rights. The organisation brings out independent reports on the violation of Human Rights all over the world.
a. United Nations Human Rights Commission *b.* Amnesty International
c. National Human Rights Commission *d.* Red Cross Society
- 158.** A formal document containing an order of the court to the government issued only by High Court or the Supreme Court.
a. Summon *b.* Writ *c.* Covenant *d.* Claim
- 159.** A group of human population whose members usually identify with each other on the basis of a common ancestry and united by cultural practices, religious beliefs and historical memories.
a. Political parties *b.* Pressure group *c.* Ethnic group *d.* Amnesty group
- 160.** Match the following

List I	List II
A. Wular Lake	1. The largest freshwater complex in North Eastern India
B. Chilka Lake	2. The largest man-made lake on the sub-continent
C. Nagarjun Sagar Lake	3. The world's second largest Brackish lagoon
D. Loktak Lake	4. Largest fresh water lake in India

Codes

A B C D

a. 3 4 2 1

A B C D

b. 4 3 2 1

A B C D

c. 1 2 3 4

A B C D

d. 2 1 3 4

- 161.** Which of the following is/are an UNESCO World Heritage Sites on Indian Railways?
a. Darjeeling Himalayan Railways *b.* Nilgiri Mountain Railways
c. Kalka-Shimla Railways *d.* All of these
- 162.** Which of the following lakes is a Saline Soda lake and was created by a meteor impact during the pleistocene epoch?
a. Lonar Lake *b.* Powai Lake *c.* Salim Ali Lake *d.* Bhoj Wetland
- 163.** The headquarters of the International Court of Justice is situated at which of the following places?
a. The Hague *b.* Vienna *c.* Geneva *d.* Paris
- 164.** Mahinder Singh Dhoni became the most successful Indian Test Cricket Captain, surpassing the previous record of which of the following Indian Test Cricket Captain?
a. Sourav Ganguly *b.* Sunil Gavaskar
c. Mohammad Azharuddin *d.* Mansur Ali Khan Pataudi
- 165.** Which one among the following was part of Gandhi-Irwin Agreement of 1931?
a. Stern action against policeman guilty of Brutal assault on Satyagraha
b. Nehru to represent congress at the round table conference of 1931
c. Delection of communal question from the Agenda of the conference
d. Release of political prisoners excepting those guilty of arson and violence
- 166.** Which amongst the following provided a common factor for tribal insurrection in India in the 19th century ?
a. Introduction of a new system of land revenue and taxation of tribal products
b. Influence of foreign religious missionaries in tribal areas
c. Rise of a large number of money-lenders, traders and revenue farmers as middle men in tribal areas
d. The complete disruption of the old agrarian order of the tribal communities

167. What was the reason for Mahatma Gandhi to organise a Satyagraha on behalf of the peasants of Kheda?

- I. The administration did not suspend the land revenue collection in spite of a drought.
- II. The administration proposed to introduce permanent settlement in Gujarat.

Which of the above statement(s) is/are correct?

- a. Only I
- b. Only II
- c. Both I and II
- d. Neither I nor II

168. Match the following

List I	List II
A. Calligraphy	1. A term used to describe pocket size books
B. Vellum	2. A historical account of folk talk inverse usually sung or recited
C. Ballad	3. A parchment made from the skin of animals
D. Chapbook	4. The art of beautiful and stylised writing

Codes

- A B C D
- a. 3 4 2 1
- A B C D
- b. 4 3 2 1
- A B C D
- c. 1 2 3 4
- A B C D
- d. 2 1 3 4

169. Consider the following statements about the National Human Rights Commission.

- I. The commission is an independent commission set-up by Law in 1933.
- II. The commission is appointed by the President and includes retired judges, officers and eminent citizens.
- III. The NHRC cannot by itself punish the guilty.
- IV. Like any court it can summon witnesses, question any government official. Demand any official paper, visit any prison for inspection or send its own team for on-the-spot inquiry.

Which of the above statement(s) is/are correct?

- a. I and III
- b. II and IV
- c. All of these
- d. I, III and IV

170. Under which article of the Constitution of India, can the fundamental rights of the members of the armed forces be specifically restricted?

- a. Article 23
- b. Article 33
- c. Article 19
- d. Article 21

171. The President holds office for a term of five years.

- a. from the date on which he is elected
- b. from the date on which he enters upon his office
- c. from the date determined by the Parliament
- d. from the date notified by Election Commission

172. The President is conducted oath of office by

- a. the Vice-President
- b. the Speaker of Lok Sabha
- c. the Chief Justice of India
- d. None of these

173. The Organisation of Indian Government which undertakes construction and maintenance of roads in the border areas of the country is

- a. Border Road Organisation
- b. National Highway Authority of India
- c. CPWD
- d. PWD

174. What percentage of the world's population is the population of India ?

- a. 21%
- b. 17.5%
- c. 21.5%
- d. 18%

175. Which of the following activities is/are included in primary activities?

- a. Agriculture
- b. Forestry
- c. Mining
- d. All of these

- 176.** As per census, a literate person is one who
- a.* can read and write his/her name
 - b.* can read and write any language
 - c.* is 7 years old or above and can read and write any language with understanding
 - d.* knows reading, writing along with arithmetic
- 177.** Money Bill can be introduced in
- a.* The Lok Sabha
 - b.* The Rajya Sabha
 - c.* Either of the House
 - d.* None of these
- 178.** Which sector has maximum contribution in India's GDP?
- a.* Agriculture
 - b.* Industries
 - c.* Services
 - d.* Manufacturing
- 179.** In traditional Indian clothing pattern, wearing of turban symbolises
- a.* protection from the heat
 - b.* respectability
 - c.* fashion
 - d.* ceremonial necessity
- 180.** By 1448, Gutenberg perfected the printing system. The first book he printed was the
- a.* Bible
 - b.* Novel
 - c.* Book of French Revolution
 - d.* None of these

Paper I : Mental Ability Test

1. (b) $462, 420, 380, \boxed{342}, 306$
 $\begin{array}{ccccccc} & & \uparrow & & \uparrow & & \uparrow \\ & & -42 & & -40 & & -38 \\ & & \downarrow & & \downarrow & & \downarrow \\ & & -36 & & & & \end{array}$

2. (c) $6, 13, 28, \boxed{59}$
 $\begin{array}{cccc} & & \uparrow & \\ & & \times 2 + 1 & \\ & & \uparrow & \\ & & \times 2 + 2 & \\ & & \uparrow & \\ & & \times 2 + 3 & \end{array}$

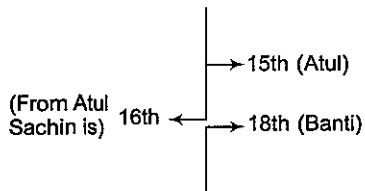
3. (a) $0.5, 0.55, 0.65, 0.80, \boxed{1}$
 $\begin{array}{ccccccc} & & \uparrow & & \uparrow & & \uparrow \\ & & +.05 & & +.10 & & +.15 \\ & & \downarrow & & \downarrow & & \downarrow \\ & & +.20 & & & & \end{array}$

4. (d) $729, 512, 343, 216, 125, \boxed{64}, 27, 8$
 $\begin{array}{ccccccc} \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ 9^3 & 8^3 & 7^3 & 6^3 & 5^3 & 4^3 & 3^3 & 2^3 \end{array}$

5. (b) $2, 4, 3, 9, 4, 16, 5, \boxed{25}, 6, 36, 7, 49$
 $\begin{array}{ccccccc} \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow \\ \times 2 & \times 3 & \times 4 & \times 5 & \times 6 & \times 7 & \end{array}$

6. (d) Professor delivers lecture to his students. Same as, doctor gives medicine to his patients.
 7. (a) Ship is the principal means of transport in sea. Same as, camel is the principal means of transport in desert.
 8. (b) 'Beautiful' use to describe the prettiness of a girl. Same as, 'handsome' use to prettiness of a boy.
 9. (a) All except 'pink' are the colours seen in the rainbow.
 10. (b) All except 'dog' comes in the category of cattle.
 11. (a) All except 'X-ray' are electronic media.
 12. (a) All except 'arrogance' are adjectives, while arrogance is a noun.

13. (a)



\therefore So, number of students is $(15 + 16 + 18) = 49$

14. (d) Mohan > Sohan > Raju > Ravi or Deepak
 15. (b) $(101 + 15) - (43 + 35) = 38$
 Similarly, $(48 + 184) - (56 + 34) = 142$
 16. (b) $(6 + 4) = 10^2 = 100$
 $(5 + 4) = 9^2 = 81$
 $(5 + 3) = 8^2 = 64$
 $(4 + 2) = 6^2 = 36$

17. (b) $\frac{84}{12} = 7 \times 2 = 14$
 $\frac{81}{9} = 9 \times 2 = 18$
 $\frac{88}{11} = 8 \times 2 = 16$
 Similarly,

18. (d) Letters form words, words form sentences, sentences form paragraphs, paragraphs form story.
 19. (c) The actual process to obtaining butter is as follows
 Grass \rightarrow Cow \rightarrow Milk \rightarrow Curd \rightarrow Butter
 20. (a) The process is as follows
 Crime \rightarrow Arrest \rightarrow Judgement \rightarrow Punishment \rightarrow Prison
 21. (c) 22. (d) 23. (c) 24. (d)
 25. (d) 26. (c) 27. (b)
 28. (d) In figure (d) inner circle is not in touch with other outer circles.

29. (c) In figure (c) directions of alternative arrows are different.
 30. (c) In figure (c) there are two straight lines.
 31. (c) 32. (a) 33. (d)
 34. (b) X moves in clockwise while shaded part moves in anti-clockwise direction.
 35. (b) In each figure, one line is removed in the design subsequent.
 36. (c) In each figure, one arrow is added in the design subsequent.
 37. (b) Let there be x members in the team excluding captain
 Captain's share = $\frac{1}{4}$ of the cake
 Other's share = $\frac{3}{4}$ of the cake
 The share of each member is $\frac{3}{4x}$.
 Given, $2 \left(\frac{3}{4x} \right) = \frac{1}{4} \Rightarrow x = 6$
 \therefore Total number of members = 6 members + captain
 = 7 members

38. (c) From left side = 17
 From right side = 17
 Total = $34 - 1 = 33$ boys are there
 39. (a) $A + B + C = 800$
 $2x + x + x = 800$
 $x = \frac{800}{4} = 200$
 A's share = $2x = 2 \times 200 = 400$

40. (a) Given, $5 + 3 \times 20 - 10 \div 5$

After change of sign

$\Rightarrow 5 \times 3 + 20 \div 10 - 5$

$\Rightarrow 5 \times 3 + 2 - 5$

$\Rightarrow 15 + 2 - 5 \Rightarrow 12$

[by Bodmass rule]

41. (c) Given, $24 - 2 + 12 \times 8 + 16$

After change of sign

$\Rightarrow 24 \div 2 \times 12 + 8 - 16$

$\Rightarrow 12 \times 12 + 8 - 16$

$\Rightarrow 144 + 8 - 16 \Rightarrow 136$

[by Bodmass rule]

42. (d) Given, $171 \div 36 + 15 - 5 \times 25$

After change of sign

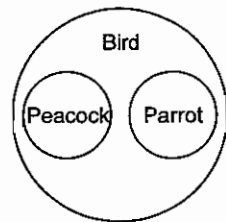
$171 - 36 \times 15 \div 5 + 25$

$\Rightarrow 171 - 36 \times 3 + 25$

$\Rightarrow 171 - 108 + 25 \Rightarrow 88$

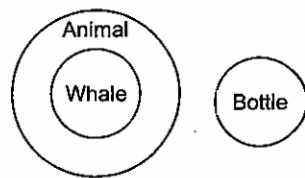
[by Bodmass rule]

43. (a)

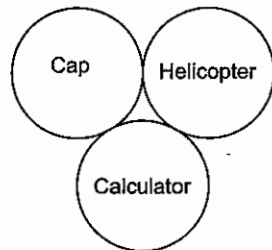


\therefore Peacock and parrot are birds.

44. (b)

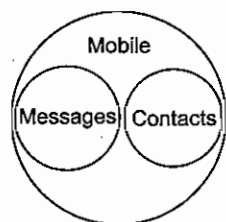


45. (d)



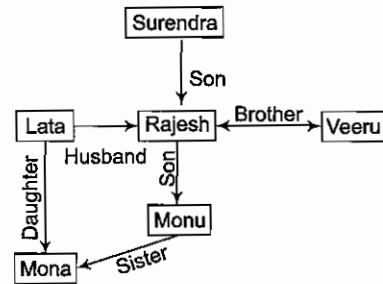
\therefore All are different from to each other.

46. (a)



\therefore Messages and contacts exists in mobile.

Solutions (Q. Nos. 47-50)



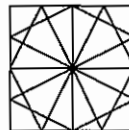
47. (b) Mona is the sister of Monu.

48. (c) Lata is the mother of Monu.

49. (a) Surendra is the father-in-law of Lata.

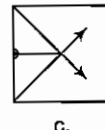
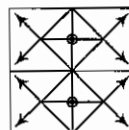
50. (d) There are 4 males and 2 females in the family.

51. (d)



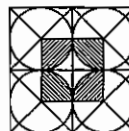
d.

52. (c)



c.

53. (c)



c.

54. (a) Each row of the matrix contains one shaded circle with bar lines. In a sequence of either 2, 3, 4 or 3, 4, 5 etc., in each row.

55. (b) The shaded part inside the rectangle moves from one corner to another in clockwise direction, as we move from left to right in a row.

56. (b) All number are successive prime numbers.

57. (a) Number of days from 21st July, 1987 to 31st March 1988 \rightarrow

$10 + 31 + 30 + 31 + 30 + 31 + 31 + 29 + 31 = 254$

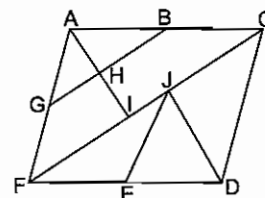
Number of odd days = $\frac{254}{7} = 2$

\therefore Friday + 2 = Sunday

58. (b) Number of odd day = $\frac{71}{7} = 1$

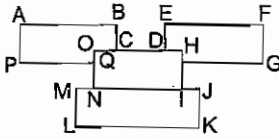
\therefore Friday - 1 = Thursday

59. (c)



Triangles are $\angle GAH, \angle ABH, \angle GAB,$
 $\angle FAI, \angle IAC, \angle FAC, \angle FJE,$
 $\angle EJD, \angle FJD, \angle JCD$ and $\angle FCD$ i.e., 11.

60. (b)



Rectangles are N O H I and M J K L.

Solutions (Q. Nos. 61-63)

South facing ↓ Z A Y

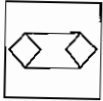
North facing ↑ Q J R

61. (a)

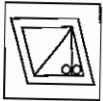
62. (b)

63. (c)

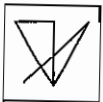
64. (b)



65. (c)



66. (b)



67. (d)

68. (d)

69. (b)

70. (c) 7753213527 77527 527



So, there are three such 2 S.

71. (a) Red, green, pink and white are adjacent to blue colour, so yellow will be on the opposite side of blue colour.

72. (b) When dice moves left to right then five dots appear adjacent to 1 and 2 dots. 5 dots will be there on opposite side of three dots.

73. (b) \therefore Total number of cubes
 $= 5 \times 3 + 3 + 6 + 6 + 2 + 3 = 35$

74. (b) Figure (A) have two four arms figure while figure (B) have total eight arm figure. Similarly, answer figures must have six arms.

75. (a) Change the position of darkened square accordingly.

76. (d) Corner figures must be placed in the central figure accordingly.

77. (b) In 'Artist' and 'Artificial', Artificial will come first on the basis of fifth letter.

78. (a) In 'Opportunity' and 'Opposite', Opportunity comes first on the basis of fifth letter.

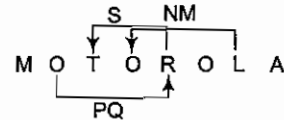
79. (c) On the basis of fourth letter, Insist will come first on the basis of fifth letter.

80. (c) Out of magical Machine and Magnet, on the basis of third letter, Machine will come first.

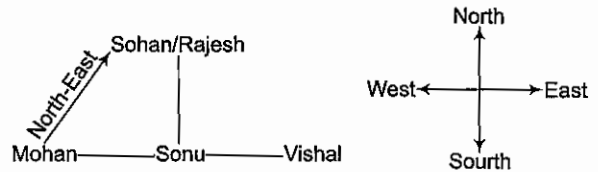
81. (b) REFER cannot be formed.

82. (b) QUEUE cannot be formed.

83. (b) There are only three such type of pairs.



Solutions (Q. Nos. 84-87)



84. (a)

85. (a)

86. (d)

87. (c)

88. (a) 1. Christmas
 3. Cinema
 5. Create

2. Chronic
 4. Cloth

89. (a) 1. Diagnose
 3. Dial
 5. Diameter

2. Diagram
 4. Dialogue

90. (b) 1. Encounter
 3. English
 5. Enrich

2. Energetic
 4. Enlock

Paper II : Scholastic Aptitude Test

91. (a) Since, displacement is zero, hence average velocity is also zero.
92. (a) A satellite in a circular orbit has a constant speed which depends on the mass of the planet and the distance between the satellite and centre of planet.
93. (c) Temperature in the train and container are same.
94. (a) SONAR is a technique that uses phenomenon of reflection of sound.
95. (c) The mirror used is convex and cylindrical with vertical axis.
96. (a) Mechanical waves required a medium for its propagation. Sound wave is a mechanical wave.
97. (c) $1 \text{ tesla} = 1 \text{ Wb/m}^2 = 1 \text{ N/A} \cdot \text{m} = 10^4 \text{ gauss}$
98. (a) In non-uniform magnetic field, due to a couple of forces a magnetic needle experience a force and a torque.
99. (b) The property of an object that causes it to create a magnetic field in opposition to an externally applied magnetic field. So the material will be diamagnetic.
100. (d) Number of Images

$$n = \frac{360^\circ}{\theta} - 1 \Rightarrow 3 = \frac{360^\circ}{\theta} - 1$$

$$4 = \frac{360^\circ}{\theta} \Rightarrow \theta = \frac{360^\circ}{4} \quad \theta = 90^\circ$$
101. (c) Ciliary muscles change the focal length of eye lens. The focal length of normal eye lens is about 25 cm.
102. (d) Glass is poor conductor and if a body is not allowed to expand when heated, great forces are set up. So Glass should be thin.
103. (c) Graphite is the allotrope of carbon (atomic number 6).
104. (b) During electrolysis, Cl gas is produced at anode while H₂ gas is produced at cathode.
105. (a) $\text{K}_2\text{O(s)} + \text{H}_2\text{O(l)} \longrightarrow 2\text{KOH}$
 $\text{Na}_2\text{O(s)} + \text{H}_2\text{O(l)} \longrightarrow 2\text{NaOH}$
 $2\text{Al(s)} + 6\text{HCl(aq)} \longrightarrow 2\text{AlCl}_3\text{(aq)} + 3\text{H}_2\text{(g)}$
106. (d) **Blue** On adding universal indicator solution to a dilute solution of NaHCO₃, blue colour is developed because NaHCO₃ is alkaline in nature.
107. (d) All these elements have 7 electrons in their outermost shell. They require one more electron to fulfill their outer shells. Hence, their valency is - 1 and are called as halogens.
108. (a) Distillation is used to separate alcohol from the mixture of alcohol and water.
109. (d) **Gallium** Its atomic number is 31 and it is a transition metal.
110. (a) Alkene- C_nH_{2n} ethene (C₂H₄).
 Haloalkanes- C_nH_{2n+1} - x chloroethane (C₂H₅Cl)
 Alkane C_nH_{2n} - propane (C₃H₈)
111. (a) True solution does not exhibit Tyndall effect. Tyndall effect involves the scattering of a beam of light as it passes through a medium having particles of colloidal size. Since, particles of true solution are too small to scatter light, hence the beam of light passing through true solution does not get scattered and so true solution does not show Tyndall effect.
112. (c) Phosphoric acid
 $\text{P} + 5\text{HNO}_3 \longrightarrow \text{H}_3\text{PO}_4 + 5\text{NO}_2 + \text{H}_2\text{O}$
113. (j) Calamine is the ore of zinc.
 Pyrolusite is the ore of manganese.
114. (d) X is homogeneous, substances that are uniform in composition are said to be homogeneous.
115. (a) Women need more iron because they lose blood each month during their period.
116. (c) The ammonia is absorbed into the portal circulation, taken up by the liver and converted in the liver via the urea cycle into urea.
117. (c) In 1996, cloning was revolutionised when Ian Wilmut and his colleagues at the Roslin Institute in Edinburgh, Scotland, successfully cloned a sheep named Dolly.
118. (d) As trees age, they grow in height and width. Observing a cross section of a tree (tree cookie) you will see growth rings. You can tell the age of a tree by counting these rings.
119. (a) Silk worm - *Bombyx mori*
 Mustard - *Brassica campestris*
 Mango - *Mangifera indica*
 Opium - *Papaver somniferum*
120. (a) Vermicomposting uses earthworms to turn organic wastes into very high quality compost.
121. (a) Vitamin-A (Retinol), Vitamin-D (Calciferol), Vitamin-E (Tocopherol).
122. (b) Analogous organs are those that perform similar functions but have entirely different embryonic origins.
123. (d) *E. coli* (*Escherichia coli*), along with other types of enterobacteria, synthesise vitamins which are then absorbed by the body e.g., vitamin K and B-complex vitamins.
124. (c) Sucrose synthesised in green leaves is exported via the phloem.
125. (c) A potometer is a piece of apparatus used to measure the rate of water loss from a plant (transpiration).

126. (a) $\angle BMN + \angle DNM = 180^\circ$

$$\Rightarrow \frac{1}{2} \angle BMN + \frac{1}{2} \angle DNM = 90^\circ$$

$$\Rightarrow \angle QMN + \angle MNQ = 90^\circ$$

$$\Rightarrow \angle MQN = 180^\circ - (\angle QMN + \angle MNQ)$$

$$\therefore \angle MQN = 90^\circ$$

127. (b) Let the number be x and y .

$$\therefore x + y = 15 \quad \dots(i)$$

$$\text{and } \frac{1}{x} + \frac{1}{y} = \frac{3}{10} \quad (\text{by given condition})$$

$$\therefore \frac{x+y}{xy} = \frac{3}{10} \Rightarrow \frac{15}{xy} = \frac{3}{10}$$

$$\Rightarrow xy = 50$$

$$x - y = \sqrt{(x+y)^2 - 4xy}$$

$$= \sqrt{(15)^2 - 4 \times 50}$$

$$= \sqrt{25} = 5$$

$$x - y = 5 \quad \dots(ii)$$

On solving Eqs. (i) and (ii), we get

$$x = 10 \text{ and } y = 5$$

128. (c) As $\sqrt{x+4} = x-2$

On squaring both sides, we have

$$(x+4) = (x-2)^2$$

$$\Rightarrow x+4 = x^2 + 4 - 4x$$

$$\Rightarrow x^2 - 5x = 0$$

$$\Rightarrow x = 0, x = 5$$

But for $x = 0$, $\sqrt{0+4} = 0-2$

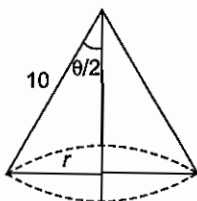
$$\sqrt{4} \neq -2$$

So, $x = 5$ is the only value of x .

129. (d) Area of sheet = $\pi \times 10^2 = 100\pi \text{ cm}^2$

Remaining area = 60% of 100π

$$= \frac{60}{100} \times 100\pi = 60\pi$$



Here, $l = 10 \text{ cm}$

Lateral surface area = 60π

$$\therefore \pi r \times 10 = 60\pi$$

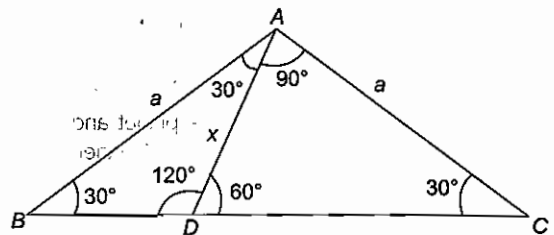
$$\Rightarrow r = 6 \frac{r}{l} = \sin \frac{\theta}{2}$$

$$\Rightarrow \sin \frac{\theta}{2} = \frac{6}{10} = \frac{3}{5}$$

$$\Rightarrow \frac{\theta}{2} = \sin^{-1} \left(\frac{3}{5} \right)$$

$$\therefore \theta = 2 \sin^{-1} \left(\frac{3}{5} \right)$$

130. (c) In $\triangle ADC$,



$$\angle DAC = 180^\circ - 60^\circ - 30^\circ = 90^\circ$$

Again, in right angled $\triangle DAC$,

$$\tan 60^\circ = \frac{AC}{AD} \Rightarrow \sqrt{3} = \frac{a}{x}$$

$$\Rightarrow x = \frac{a}{\sqrt{3}}$$

131. (d) Let number of sides be n .

Each exterior angle of regular polygon of n sides = $\frac{360^\circ}{n}$

Each interior angle = $\frac{(n-2)180^\circ}{n}$

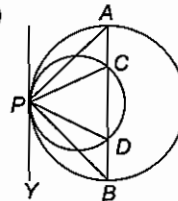
$$\text{So, } \frac{360}{n} = \frac{1}{3} \left[\frac{(n-2) \times 180}{n} \right] \quad (\text{by condition})$$

$$\Rightarrow \frac{360}{n} = \frac{(n-2)60}{n}$$

$$\Rightarrow 360 = (n-2)60 \Rightarrow 6 = n-2$$

$$\therefore n = 8$$

132. (a)



$$\angle BPY = \angle BAP \quad (\text{angles in alternate segments})$$

$$\angle DPY = \angle DCP \quad (\text{angles in alternate segments})$$

$$\therefore \angle DPY - \angle BPY = \angle DCP - \angle BCP$$

$$\text{or } \angle DPB = \angle CPA$$

133. (d) Mean of $A = \frac{2+3+7+1+3+2+3}{7} = \frac{21}{7} = 3$

Mode of $A = 3$, has maximum frequency

Arrange data in ascending order, we have

1, 2, 2, 3, 3, 3, 7

Median of $A = \left(\frac{7+1}{2} \right)$ th value = 4th value = 3

Here, Mean, Median and Mode are equal.

134. (c) Let marked price be ₹ x .

$$\text{SP} = 125\% \text{ of } 380$$

$$= \frac{125 \times 380}{100} = ₹ 475$$

$$\therefore \text{Discount} = 5\% \text{ of } x = \frac{5}{100} x = \frac{x}{20}$$

Since, $SP = MP - \text{Discount}$

$$\Rightarrow 475 = x - \frac{x}{20}$$

$$\Rightarrow 475 = \frac{19x}{20}$$

$$\therefore x = ₹ 500$$

135. (b) Area of shaded region = Area of square - {4 × Area of a sector + Area of circle at centre}

$$= 4 \times 4 - \left\{ 4 \times \frac{90}{360} \times \pi \times 1^2 + \pi \times 1^2 \right\}$$

$$= 16 - (\pi + \pi)$$

$$= (16 - 2\pi) \text{ cm}^2$$

136. (b) $P(\text{Mohan lying}) = P(\bar{M}) = \frac{3}{7}$

$$\text{and } P(\text{Moh not lying}) = P(M) = 1 - \frac{3}{7} = \frac{4}{7}$$

$$P(\text{Ram lying}) = P(\bar{R}) = \frac{4}{6} = \frac{2}{3}$$

$$\text{and } P(\text{Ra not lying}) = P(R) = 1 - \frac{2}{3} = \frac{1}{3}$$

$P(\text{Both giving true reply})$

$$= P(M) \times P(R) = \frac{4}{7} \times \frac{1}{3} = \frac{4}{21}$$

137. (a) We have, A (2, 3), B (5, -3) and C (-5, 4).

$$AB = \sqrt{(5-2)^2 + (-3-3)^2}$$

$$= \sqrt{2^2 + 5^2} = \sqrt{29}$$

$$BC = \sqrt{(-5-5)^2 + (4+3)^2}$$

$$= \sqrt{25 + 49} = \sqrt{74}$$

$$\text{and } CA = \sqrt{(-5-3)^2 + (4-2)^2}$$

$$= \sqrt{64 + 4} = \sqrt{68}$$

$$BC^2 < AB^2 + CA^2$$

So, ΔABC is an acute triangle.

138. (b) Increased wages of worker = $200 + 20\%$ of $200 = ₹ 240$

Also, let the worker worked for x h.

$$\therefore \text{Reduced working hours} = x - \frac{20}{100}x = 0.80x$$

Now, when he worked for x h, his wages = ₹ 240

\therefore When he worked for $0.8x$ h, his wages will be

$$= \frac{240}{x} \times 0.8x = ₹ 192$$

139. (a) Let C get ₹ x .

Now, by given conditions

$$\text{Amount of B} = ₹ (x + 8)$$

$$\text{and Amount of A} = ₹ (x + 15)$$

$$\therefore x + (x + 8) + (x + 15) = 53 \Rightarrow x = 10$$

$$\therefore A : B : C = (10 + 15) : (10 + 8) : 10$$

$$= 25 : 18 : 10$$

140. (c) Given, $ab - b + 1 = 0$

$$\Rightarrow b(a - 1) = -1$$

$$\Rightarrow b = \frac{-1}{1-a} \quad \dots(i)$$

Also, $bc - c + 1 = 0$

$$\Rightarrow b = \frac{-1+c}{c} \quad \dots(ii)$$

From Eqs. (i) and (ii), we get

$$\frac{1}{1-a} = \frac{-1+c}{c}$$

$$\Rightarrow c = (1-a)(-1+c)$$

$$\Rightarrow c = -1 + c + a - ac$$

$$\therefore a - ac = 1$$

141. (b) Let the lowest sides of a right angled triangle be 3, 4, 5.

By Pythagoras theorem, $(3)^2 + (4)^2 = (5)^2$.

Hence, one of its sides is always divisible by 5.

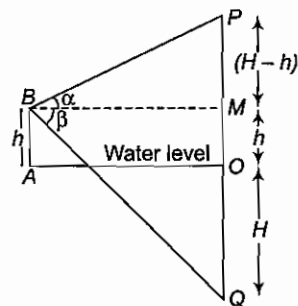
142. (d) As, $\sin x + \sin^2 x = 1 \quad \dots(i)$

$$\Rightarrow \sin x = 1 - \sin^2 x = \cos^2 x$$

$$\therefore \cos^2 x + \cos^4 x = \sin x + \sin^2 x = 1$$

[from Eq. (i)]

143. (b) Let P be the cloud at height H above the level of the water in the lake and Q its image in the water.



$$\therefore OQ = OP = H$$

B is at a point at a height $AB = h$, above the water.

Elevation of P and depression of Q from B are α and β , respectively.

In ΔPBM ,

$$\tan \alpha = \frac{H-h}{BM}$$

$$\therefore BM = (H-h) \cot \alpha \quad \dots(i)$$

$$\text{In } \Delta QMB, \tan \beta = \frac{QM}{BM}$$

$$\therefore BM = (H+h) \cot \beta \quad \dots(ii)$$

From Eqs. (i) and (ii), we get

$$(H-h) \cot \alpha = (H+h) \cot \beta$$

$$\Rightarrow H(\cot \alpha - \cot \beta) = h(\cot \alpha + \cot \beta)$$

$$\therefore H = \frac{h(\cot \alpha + \cot \beta)}{(\cot \alpha - \cot \beta)}$$

144. (a) Let the boy completes the work in x days, thus according to the condition,

$$\frac{1}{7} + \frac{1}{8} + \frac{1}{x} = \frac{1}{3}$$

or $\frac{1}{x} = \frac{1}{3} - \frac{1}{8} - \frac{1}{7} = \frac{11}{168}$

$\therefore x = \frac{168}{11}$ days

So, money is to be shared in the ratio.

$$\frac{1}{7} : \frac{1}{8} : \frac{11}{168} \text{ or } 24 : 21 : 11$$

Thus, A's amount = $\frac{24}{56} \times 1400 = ₹ 600$

and B's amount = $\frac{21}{56} \times 1400 = ₹ 525$

\therefore Boy's amount = $\frac{11}{56} \times 1400 = ₹ 275$

145. (c) Amount due at the end of 1 year
= $4000 \left(1 + \frac{8}{100}\right) = ₹ 4320$
 \therefore Amount due after 1 year = $(4320 - 1500)$
= ₹ 2820

Amount due after second year
= $2820 \left(1 + \frac{8}{100}\right) = ₹ 3045.60$

\therefore Amount due after second year
= $(3045.60 - 1500) = ₹ 1545.60$

Amount due at the end of the third year
= $1545.60 \left(1 + \frac{8}{100}\right) = ₹ 1669.25$

So, amount due after the payment of third instalment
= $(1669.25 - 1500) = ₹ 169.25$

146. (d) Democracy represents such a system and features as regular elections and majority decisions. The elected representatives are responsible for making decisions.
147. (c) The political executive at the centre consists of President, Vice-President and Council of Ministers.
148. (c) A Coalition Government is a government of Parliamentary Government in which several political parties cooperate, reducing the dominance of anyone party within that coalition. The usual reason for this arrangement is that no party on its own can achieve a majority in the Parliament.
149. (d) The Supreme Court of India works as federal court and guardian of the Constitution. The disputes between union government and one or more states, between states, between two or more states and enforcement of Fundamental Rights come under the original jurisdiction of the Supreme Court.
150. (d) Cripps Mission-1942, Wavell Plan- 1945.
Cabinet Mission -1946, Mountbatten Plan-1947,

151. (b) Alauddin Khilji opposed the interference of the Ulema in the matters of state and in this respect, he departed from the tradition of previous Sultans of Delhi. The law was, will of the monarch, and had nothing to do with the laws of prophet.

152. (d) Santhal Rebellion – 1855
Mutiny of the Sepoys – 1857
Indigo Revolt – 1859
Deccan Riot – 1875

153. (a)

154. (d) Tripitaka is a Sanskrit word meaning three baskets. It is the traditional term used by Buddhist traditions to describe their various common scriptures. The tripitakar Sutta Pitaka, Vinaya Pitaka and Abhidhamma Pitaka.

155. (a) Rowlatt Act – 10 March, 1919,
Jalianwalla Massacre – April 1919,
Khilafat Movement – 1920,
Non-Cooperation Movement

156. (a) Every bill passed by the Parliament requires the assent of the President. The judiciary i.e., Supreme Court and High Court under the power of judicial review, declare any law passed by the legislature or executive action of the government null or void, if it violates the provisions of the Constitution.

157. (b) Amnesty International organisation is a non-governmental organisation focused on Human Rights, to conduct research and generate action to prevent and end grave abuses of Human Rights and to demand justice for those whose rights have been violated.

158. (b) A Writ is a formal written order issued by a body with administrative or judicial jurisdiction. The Constitution broadly provides for five kinds of prerogative writs. Habeas Corpus, Certiorari, Mahdamus, Quo Warranto and Prohibition.

159. (c) Ethnic group is a socially defined category based on common culture or nationality.

160. (b) 161. (d)

162. (a) Lonar Lake is a Saline Soda Lake located at Lonar in Buldana, district in Maharashtra was created by a meteor impact during the pleistocene epoch.

163. (a) The International Court of Justice (ICJ) is the principal judicial organ of the United Nations. It was established in June, 1945 by the Charter of the United Nations at the Hague Netherlands and began to work in April, 1946.

164. (a) MS Dhoni is the most successful Indian Test Cricket Captain with 24 wins. He surpassed the previous record of 21 wins by Sourav Ganguly.

165. (d) The Gandhi-Irwin Pact was a political agreement signed between Gandhi and Lord Irwin in 1931. The agreement calls for discontinuation of Civil Disobedience Movement/ participation by INC in the Round Table Conference and release of prisoners arrested for participating in the Civil Disobedience Movement.

166. (c) affirmation that he/she shall protect, preserve and defend the Constitution
167. (a) The first Satyagraha revolution inspired by Mahatma Gandhi in the Indian Independence Movement occurred in Champaran in Bihar and the Kheda district of Gujarat in 1916 and 1917, respectively.
168. (b)
169. (d) The National Human Rights Commission is an autonomous public body constituted under Human Rights ordinance on September 28, 1993. The NHRC is responsible for the protection and promotion of Human Rights.
170. (b) Article 33 empowers the Parliament to restrict or abrogate the Fundamental Rights of the member of armed forces, para-military forces, police forces, intelligence agencies and analogous forces. The objective of this provision is to ensure the proper discharge of their duties and the maintenance of discipline among them.
171. (b)
172. (c) The President is required to make and subscribe in the presence of Chief Justice of India (or in his absence) the senior-most judge of the Supreme Court, an oath or
173. (a) The BRO maintains roads that serve the border areas of the country. The organisation develops and maintains arterial roads on the borders of India.
174. (b)
175. (d) Primary activities are those activities, where natural resources extracted from the Earth. Mining, farming, agriculture, forestry fisheries etc., are examples of primary activities.
176. (c) As per census in India a person is regarded as literate in case he or she is within the age group of 7 years and above can read and write any language with understanding.
177. (a) Money Bill cannot be introduced in the Rajya Sabha.
178. (c) Services contribute around 58 % in the GDP of India.
179. (b) Wearing of turban in traditional Indian clothing pattern symbolises nobility, honour and respect.
180. (a) The Gutenberg 'Bible' is the first complete book printed with moveable metal type. Prior to its printing in 1454 or 1455, books were either copied by hand or printed from engraved wooden blocks.