

NTSE

National Talent Search Examination

MAT + SAT

[Stage II]

Time : 180 Min

Max. Marks : 200

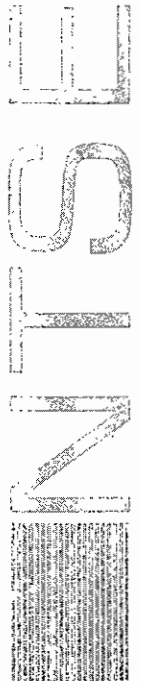
Read the following instructions carefully.

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 200 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

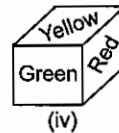
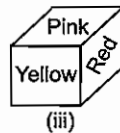
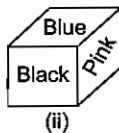
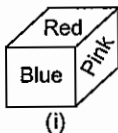
5. Now, turn to the next page and start answering the questions.



Paper I : Mental Ability Test

Section A Reasoning









- A bird shooter was asked how many birds he had in the bag. He replied that there were all sparrows but six, all pigeons but six and all ducks but six. How many birds he had in the bag in all?
a. 9 *b.* 18 *c.* 27 *d.* 36
- The 45 members of a club decided to play a chess tournament. In each match looser gets eliminated. So, in total how many matches must be played to decide the winner?
a. 40 *b.* 45 *c.* 44 *d.* 50
- Form A to E five buildings are in a row. A is to the right of B; E is to the left of C and to the right of A; B is to the right of D. Which building is exactly in the middle?
a. E *b.* A *c.* B *d.* D
- In a row of twenty five children facing North, W is fifth to the right of R, who is sixteenth from the right end of the row. What is W's position from the right end of the row?
a. 11th *b.* 10th *c.* 12th *d.* None of these
- Choose the alternative which is closely resembles the water image of the given combination.
 NUCLEAR
a. БУЕГСУИ *b.* ИИСТЕАВЪ *c.* ИИУСГЕАВЪ *d.* ИИУСГЕАВЪ
- Choose the alternative which is closely resembles the mirror image of the given combination.
 MALAYALAM
a. MALAYALAM *b.* MAJAYAJAM *c.* МАГЛАУАГАМ *d.* МАГАУАГАМ
- Here are some words translated from an artificial language
 lou jin is wonderful person
 yeh jin is good person
 yeh suk is good day
 Which word could possibly means wonderful day?
a. jin yeh *b.* lou suk *c.* jin suk *d.* lou yeh
- What will be the next number in the sequence?
 0, 34 84, 68, ...
a. 12 *b.* 50 *c.* 30 *d.* 44
- Find the missing term in the following sequence.
 4, 24, 49, ?, 134, 204
a. 84 *b.* 64 *c.* 70 *d.* 80
- From the given four positions of a single dice, find the colour at the face opposite to the face having red colour.







- a.* Yellow *b.* Pink *c.* Green *d.* Black

11. Select a suitable figure from the four alternatives that would complete the figure matrix.

Problem Figures

		
		
		?

Answer Figures

			
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- a. b. c. d.

Directions (Q. Nos. 12-13) Take the given statement (s) as true and decide which of the conclusion logically follow from the statements.

12. **Statements** All the paper are books. All the bags are books. Some purses are bags.

Conclusions

- I. Some papers are bags.
 II. Some books are papers.
 III. Some books are purses.

- a. Only I b. II and III c. I and II d. I and III

13. **Statements** All the locks are keys. All the keys are bats. Some watches are bats.

Conclusions

- I. Some bats are locks.
 II. Some watches are keys.
 III. All the keys are locks.

- a. I and II b. Only I c. Only II d. I and III

14. Complete the following series.

a_ac_aa_aa_bc_bcc

- a. cabba b. ccbbb c. bbbbb d. cbacb

15. If 'ROBUST' is codes as 'QNATRS' in a certain language, which word would be coded as 'ZXCMP'?

- a. BZEOR b. AYDNQ c. AWDLQ d. YBNO

16. Which group of letters is different from other?

- a. PQALR b. DOCQV c. XUZVB d. LMPZQ

17. Fill the missing number in the following matrix.

6B	24D	4F
5L	?	15P
56X	7Z	8B

- a. 8P b. 3N c. 15N d. 6P

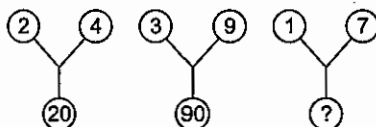
18. Every man should have his identity card with him. That card should mention his blood group, complete address and telephone number for contact, in case some serious accident takes place. Find the alternative which must be true as per the given information.

- a. Blood cannot be transfused until its group is mentioned in the card
 b. The police needs this information especially when the accident is fatal
 c. In case of emergency, he may forget his address and may need the card to contact his house
 d. None is supposed to forget his phone number under any circumstances

19. In this company, 60% of the employees are males, 40% are females, 80% of the employees are sincere and 40% of the employees are from this city Rawalpura. Find the alternative which must be true as per the given information.

- a. All male employees are from out station
 b. All male employees are sincere
 c. 20% of female employees are not sincere
 d. None of the above

20. Find the number which will replace the question mark.



- a. 20
 b. 25
 c. 50
 d. 55

21. In the figure given below, find the value of A, B, and C.

9	A	12
B	10	7
8	C	11

- a. A = 14, B = 11, C = 9
 b. A = 13, B = 9, C = 11
 c. A = 9, B = 11, C = 13
 d. A = 9, B = 13, C = 11

Directions (Q. Nos. 22-26) Read the following information carefully and answer the questions given below.

A, B, C, D, E, F and G are playing cards sitting around a circular table.

- (i) D is not neighbour of C or E.
 (ii) A is neighbour of B and C.
 (iii) G, who is second to the left of D, is the neighbour of E and F.

22. Which of the following is correct?

- a. B is between A and D
 b. D is between F and G
 c. E is to the immediate right of G
 d. F is to the immediate left of G

23. Which of the following has the pair with the second person sitting to the immediate right of first person?

- a. BD
 b. GF
 c. AE
 d. AC

24. Which of the following will be D's position after E and D interchange their places?

- a. Neighbour of G and C
 b. To the immediate left of C
 c. To the immediate right of F
 d. Neighbour of C and A

25. Which of the following has the second person sitting between the first and third persons?

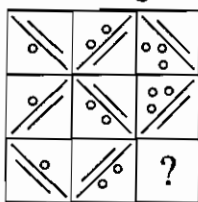
- a. DAB
 b. GCE
 c. BCA
 d. GFD

26. Which of the following is wrong?

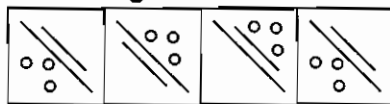
- a. A is to the immediate right of B
 b. B is to the immediate left of D
 c. F is between G and D
 d. E is between G and C

27. Select a suitable figure from the following alternatives that would complete the figure matrix.

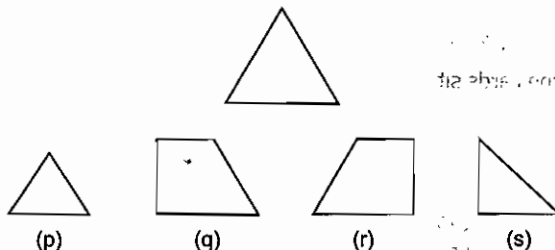
Problem Figures



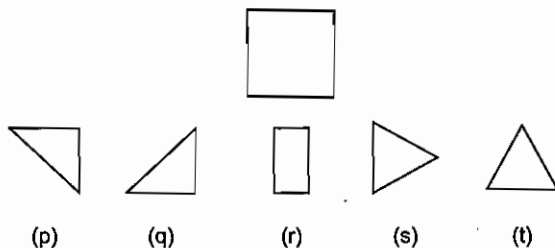
Answer Figures



28. Rahul put his timepiece on the table in such a way that at 6 pm hour hand point to North. In which direction the minute hand will point at 9 : 15 pm?
 a. South-East b. South c. North d. West
29. P started from his house towards West. After walking a distance of 25 m, he turned to the right and walked 10 m. He then again turned to the right and walked 15 m. After this he is to turn right at 135° and to cover 30 m. In which direction should he go?
 a. West b. South c. South-West d. South-East.
30. Identify which among the pieces given below will not be required to complete the triangular pattern shown below?

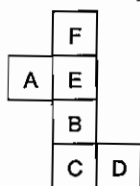


- a. p b. q c. r d. s
31. A pattern is given below. You have to identify which among the following pieces will not be required to complete the pattern?

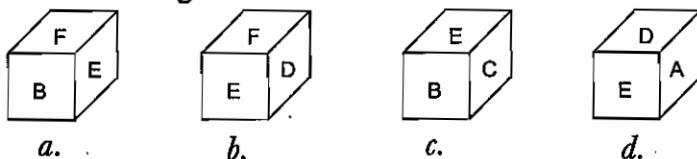


- a. r b. t c. s d. p
32. If the given figure is folded to form a box, then which among the boxes given below will be formed?

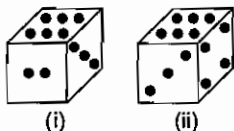
Problem Figure



Answer Figures



33. From the given two positions of a single dice, find the number of dots at the bottom face, if the top face has 3 dots.

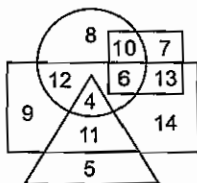


- a. 4 b. 6 c. 2 d. 1 or 5

34. Which of the following diagrams indicates the best relation between women, mothers and engineers?



35. In the following diagram, rectangle represents men, triangle represents educated, circle represents urban and square represents Government employees.



Which one of the following represents the educated men but not urban?

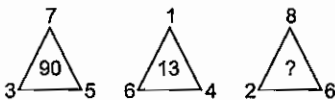
- a. 9 b. 5 c. 4 d. 11

36. Which number replaces the question mark?

6	2	17
1	4	11
3	7	?

- a. 9 b. 22 c. 21 d. 15

37. Which number replaces the question mark?



- a. 40 b. 80 c. 72 d. 46

38. Find the missing number in the following series.

8, 20, ?, 76, 148

- a. 36 b. 40 c. 35 d. 50

39. If GO = 32, SHE = 49, then some will be equal to

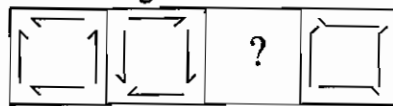
- a. 56 b. 58 c. 62 d. 69

40. Find the odd one out.



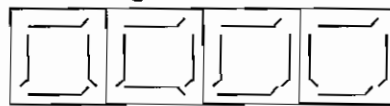
41. Which figure will replace the question mark and complete the series of figures?

Problem Figures



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

Answer Figures



a. b. c. d.

42. Given below is a problem and two Statements I and II decide, if the information given in the statement is sufficient to answer the question.

Among A, B, C, D, E and F, who is the heaviest?

Statements

(I) A and D are heavier than B, E and F but none of them is heaviest.

(II) A is heavier than D but lighter than C.

a. Data in Statement I alone is sufficient

b. Data in Statement II alone is sufficient

c. Data in both statements together is sufficient

d. Data in both statements is not sufficient

43. A sprinter runs a 100 m race. At the time of start of his race second hand of the watch was facing exactly West. He finished the race in 13 s. In which direction was the second hand facing when he cross the line?

a. 45° North of East

b. 78° North of West

c. North

d. North-West

44. A man was facing South. He turns 135° in the anti-clockwise direction and then 180° in the clockwise direction. Which direction is he facing now?

a. North-East

b. North-West

c. South-West

d. South-East

45. What will be the mirror image of

6 K L D 5 B Z T

a. 6ΣXLD5BT

b. TΣZB5DK6

c. TZB5DK6

d. TZB5DLK6

46. A group of 1200 persons consisting of captains and soldiers is travelling in a train. For every 15 soldiers, there is a captain. The number of captains in the group is

a. 85

b. 80

c. 75

d. 70

47. A farmer built a fence around his square plot. He used 27 fence poles on each side of the square. How many poles did he need all together?

a. 100

b. 104

c. 108

d. None of these

48. There 32 teams in a tournament which are divided into 4 groups of 8 team each. If a team in each group plays every team only once and then winner of each group plays semi-finals and then winner plays the final, so in total how many matches are played during a tournament?

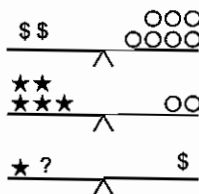
a. 110

b. 120

c. 100

d. 115

49. Which symbol replaces the question mark figure below represent a balance?



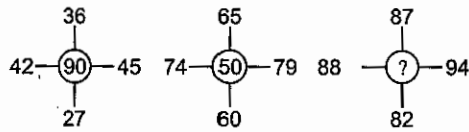
a. \$

b. ★

c. ○

d. ★

50. Identify the number in the position of question mark.



a. 60

b. 85

c. 99

d. 61

Section B General English

Directions (Q. Nos. 51-65) Read the following passages carefully and answer the questions that follow.

Passage I

The wise old Wazir was famous for his judgment and people came to him for justice from all parts of the country. One day two men came to his court and claimed ownership of an extraordinarily good-looking horse. It was a black beauty indeed. One of the men was tall, very well-dressed and soft-spoken. The other one was just the opposite. Each of them said that the horse was his. The Wazir heard them patiently and asked them to leave the horse and come to him next morning. Both the men came the next morning. The Wazir asked his soldiers to give the horse to the tall man and to arrest the other man. The tall man wanted to know how the Wazir had learnt the truth. 'Very simple', said he, 'Firstly, a man of your appearance and manners could not have been the thief. Still, I wanted to be sure, just after you had left the court. I asked one of my soldiers to leave the horse free and to see whom it followed. It went after you. This hint was enough for me'.

51. Which of the following best describes the other man?
a. Ill-dressed, short-statured, loud-voiced b. Tall, ill-dressed, courteous
c. Not well-dressed, short but good mannered d. Thin, poorly built, harsh in expression
52. The Wazir discovered the real owner of the horse
a. by arresting the other man
b. from the appearance and good manners of the tall man
c. by patiently listening to the case of theft
d. by knowing whom the horse followed
53. With the Wazir's wisdom, the tall man was
a. consoled b. impressed c. embarrassed d. undecided
54. People came to Wazir from all places because he was
a. very famous b. an old judge c. an old judge d. a wise judge
55. This story proves that
a. the court soldiers were very smart b. the judge was quiet old
c. the horse was very clever d. the judge was indeed quite intelligent

Passage II

Jyoti, a gardener's son, was once invited to attend the marriage ceremony of a Brahmin friend. Since, he loved his friend sincerely, he attended the ceremony. The bridegroom was going in a procession to the house of the bride. The procession consisted of Brahmins, men, women and children. There was hardly any person from other communities. Jyoti was walking along with the processionists.

One orthodox Brahmin recognised him and was annoyed at the sight of a low-caste boy in the marriage procession walking along with the Brahmins. Unable to contain himself, he shouted, 'How dare you walk along with us? You are not our equal. Get behind, otherwise go away'. Jyoti felt insulted. He abandoned the procession and returned home.

He narrated the whole incident to his father with anger in his eyes but his father advised him to observe the old customs. That night Jyoti could not sleep.

He thought what he could do for the equality of human beings. The caste system was deep-rooted. As lower-caste people had no education, they had accepted this mental slavery for ages. Jyoti, therefore resolved to revolt against the mental slavery and to educate the lower-caste people. He became the first Indian to start a school for the untouchables and a girls' school in Maharashtra. We recognise him today as Mahatma Phoolley.

- 56.** According to the passage, which of the following has primarily made low-caste people accept the mental slavery?
a. Poverty *b.* Old customs *c.* Apathy of change *d.* Lack of education
- 57.** According to the passage, Jyoti's father
a. was a man of revolutionary ideas
b. advised him to start a school for the untouchables
c. did not want Jyoti to break old traditions
d. was not in favour of his attending the marriage ceremony
- 58.** After his insult, Jyoti
a. left the procession and went to his friend
b. tried to take a revenge on his friend
c. decided not to join any such marriage procession in future
d. engaged himself in social service
- 59.** Why did Jyoti attend the marriage?
a. He was advised by his father accordingly *b.* He was invited by the father of the bride
c. The bridegroom was good friend of Jyoti *d.* Not mentioned in the passage
- 60.** Jyoti could not sleep that night because
a. he had to attend the marriage of his friend
b. he wanted to do something for the lower-caste people
c. the Brahmin insulted his friend
d. his father was sick

Passage III

On hearing the news of the massacre at Jallianwala Bagh, Udham Singh did not attend his school but took a train to Amritsar and visited the spot. There, he stood for several minutes in a trance, picked up the soil, rubbed it on his forehead and put some in a phial. He fasted that night. According to his family members, he placed fresh flowers on the holy dust every morning drawing inspiration from it. One early morning he went to the river Ravi and pledged that he would colour its water with the colour of his blood, to create what he called the freedom's flood.

With this aim in view in 1921, he first landed in Africa. From there he went to America to meet the Indian revolutionaries working for the liberation of the motherland. In 1923, he landed in England. In 1928, he returned to India in response to an urgent call from Bhagat Singh. When he reached Lahore, he was detained for violation of the Arms Act. He was released after four years' rigorous imprisonment. In 1935, he escaped to Germany by giving a slip to the police. From Berlin, he reached Paris and purchased a revolver. He kept it ready for action and managed to reach London again. Opportunity came on March 13, 1940 when Sir Michael O'Dwyer was to speak at a seminar in Caxton Hall. As Sir Michael turned to resume his seat after his speech, Udham Singh pulled out his revolver and fired at him. Sir Michael died without a shriek. Udham Singh was arrested and produced before the court on April 2, 1940. The court passed death sentence on him and he was hanged at Pentonville Prison, London on July 31, 1940.

61. Udham Singh went to America, where he
a. mobilised the Indian citizens for the liberation of the motherland
b. collected sufficient funds to fight colonialism
c. met his fellow citizens working for the same cause
d. visited the United States for sight-seeing
62. Where did Udham Singh buy the weapon which was used for killing Sir Michael?
a. Paris *b.* Lahore
c. London *d.* Berlin
63. Udham Singh shot Sir Michael O'Dwyer at/in
a. Jallianwala Bagh *b.* Amritsar
c. London *d.* Paris
64. When Udham Singh was arrested in Lahore, he was charged for
a. instigating his countrymen against the Britishers
b. his links with anti-British forces
c. concealing his identity and carrying underground activities
d. possessing unlicensed arms and ammunition
65. Udham Singh returned to India in 1928, mainly because he was
a. short of funds to meet his expenses *b.* to procure some arms form Lahore
c. to escape form the British Police *d.* called by a revolutionary in India

Directions (Q. Nos. 66-67) *In the following question, each passage consists of five sentences. The first sentence(S₁) and last sentence (S₂) are given. The remaining three sentences are labeled P, Q and R. You are required to find out the proper sequence of the three sentences.*

66. S₁: There is no general agreement about how the planets were formed

S₂: _____

S₃: _____

S₄: _____

P : swirling clouds of matter began to condense through the action of centrifugal force

Q : the most widley accepted theory is that about 5000 million years ago

R : the heavier molecules were concentrated near the centre of eddies

S₅: and the lighter gaseous material was thrown out towards the periphery

The sequence should be

a. QPR

b. PQR

c. RPQ

d. PRQ

67. S₁: Perhaps the best symbol of Gandhiji's philosophy is the two parallel bars of equal size

S₂: _____

S₃: _____

S₄: _____

S₅: He wrapped some of his immediate associate in tender affection

P : Gandihiji did not exclude preferences, he preferred Hinduism

Q : He loved India more then other countries

R : All nations, races, religions and persons were equal though not similar

The sequence should be

a. PRQ

b. QPR

c. RPQ

d. RQP

Directions (Q. Nos. 68-69) *Following questions have the second sentence missing. Choose the appropriate sentence from the given options to complete it.*

68. (i) A connection had long been suspected
(ii) _____
(iii) and the occurrence of Malaria.
a. same regions and seasons but the nature
b. between the abundance of mosquitoes
c. since both were at their worst
d. of this connection has not been understood
69. (i) Hobbies can fill our spare
(ii) _____
(iii) and pleasure, they also relieve mental tiredness.
a. moments with enjoyment
b. physical fatigue
c. time and do not hinder our regular work
d. and strains of daily life

Directions (Q. Nos. 70-79) *Choose the word which best fills the blanks from the following given options.*

70. You must ____ your work so that I may assign you another job.
a. accomplish
b. perform
c. finish
d. do
71. Please do not make adverse ____ on the handicapped.
a. opinions
b. remarks
c. comments
d. jokes
72. Men work so that they ____ earn a living.
a. must
b. can
c. may
d. might
73. I shall avail myself this ____ to meet you.
a. chance
b. opportunity
c. occasion
d. time
74. The magistrate ____ orders for the arrest of the criminal.
a. released
b. gave
c. issued
d. supplied
75. The house ____ a living room, a kitchen and drawing room.
a. consists
b. contains
c. possesses
d. comprises
76. I ____ to inform that the goods you have ordered are not in stock now.
a. sorrow
b. regret
c. fear
d. dare
77. Please do not ____ the door open when you go out.
a. leave
b. let
c. keep
d. make
78. I am happy to hear that you narrowly ____ being run over yesterday.
a. escaped
b. saved
c. rescued
d. skipped
79. The scenery of Himalayas is ____ in the world.
a. beautiful
b. unparalleled
c. unrivalled
d. unmatched

Directions (Q. Nos. 80-85) *Select the meaning of given Phrases/Idioms.*

80. Knock out
a. Make unconscious
b. To leave
c. To be continue
d. To forget
81. Pick out
a. To lift
b. To select
c. Refresh
d. Join together
82. Rip off
a. To change
b. To cheat
c. Meet by chance
d. To tolerate

83. Flat footed
a. Clumsy *b.* Cheaply *c.* To understand *d.* To quarrel
84. Out of tune
a. Difficult task *b.* Not in harmony *c.* Past achievements *d.* Completely changed
85. Paint the town red
a. To make progress *b.* Unforeseen trouble *c.* Bloody-fight *d.* Have a celebration

Directions (Q. Nos. 86-93) *In the following passage, there are blanks, each of which has been numbered. For each blank four words are suggested, one of which fits the blank. Find the appropriate word in each case.*

Some people believe that marriages are made in heaven. One cannot say 86 this is true or not. However, in America now many 87 who get married seek to evolve a foolproof 88 to ensure that the marriage survives. However, the idea of married persons 89 the burden a domestic chores, instead of all the dirty work 90 dumped on the woman had 91 been propagated 92 the feminist 93.

86. *a.* whether *b.* still *c.* however *d.* that
87. *a.* pairs *b.* men *c.* couples *d.* women
88. *a.* method *b.* plan *c.* system *d.* values
89. *a.* executing *b.* dividing *c.* undertaking *d.* sharing
90. *a.* being *b.* been *c.* shall *d.* will
91. *a.* long *b.* sometimes *c.* always *d.* occasionally
92. *a.* for *b.* by *c.* with *d.* along
93. *a.* group *b.* lobby *c.* section *d.* faction

Directions (Q. Nos. 94-97) *Select the most appropriate option to fill in the blanks from the given alternatives.*

94. Polyester shirts are more ____ than the cotton ones.
a. durably *b.* duration *c.* durability *d.* durable
95. Diseases are ____ through contact with infected animals.
a. transmitted *b.* transported *c.* transferred *d.* transplanted
96. Our charming hostess was very ____ to all her guests.
a. graceful *b.* gracious *c.* grateful *d.* good
97. The doctor ____ the woman that her son would recover.
a. ensured *b.* assured *c.* insured *d.* inspired

Directions (Q. Nos. 98-100) *In these questions, a key word is followed by four choices. Choose the one opposite to it in the meaning*

98. If you **pamper** the child you will regret.
a. scold *b.* scorn *c.* discourage *d.* neglect
99. On the hillside, he could see the **vague** shapes of sheep coming through the mist.
a. clear *b.* transparent *c.* plain *d.* apparent
100. Everybody called it a **lavish** party.
a. big *b.* wasteful *c.* frugal *d.* expensive

Paper II : Scholastic Aptitude Test

101. A few gram seeds were placed in each of the three pots A, B and C containing soil. The soil in pot A is mixed with some green twigs and leaves. The soil in pot B is mixed with old cow dung while soil of pot C is mixed with urea. Pots are watered regularly. Which of the following will be observed after 10 days?
- a. Lot of growth in A
b. Not much growth in B
c. Lot of growth in B but very little growth in C
d. Very little growth in A but lot of growth in B and C
102. Barley is ground to powder. The powder is mixed with water and some yeast. The mixture is kept in a closed and moist container. Which of the following will be produced?
- a. Sodium bicarbonate
b. Alcohol only
c. Carbon dioxide only
d. Ethyl alcohol and carbon dioxide
103. Which is the main function of RBCs?
- a. To fight diseases in the body
b. To carry oxygen to different parts of the body
c. To increase levels of WBCs
d. To arrest bleeding
104. Find the odd one out of the following.
- a. Cotton
b. Silk
c. Wool
d. Hair
105. Which of the following rotation of crops will reduce dependence on the use of chemical fertilizers?
- a. Rice and chilli
b. Wheat and potato
c. Potato and rice
d. Gram and rice
106. Consider the following statements
I. Carbon dioxide taken in through stomata is used in photosynthesis.
II. Oxygen taken in through stomata is used in respiration.
III. Water vapour taken in through stomata is used in transpiration.
Which of the above statements is/are true?
- a. I and II
b. I and III
c. II and III
d. I, II and III
107. From the following diagram of flowers identify the flower which will self pollinate?
-
108. Which of the following is a source of instant energy?
- a. Salt
b. Glucose
c. Water
d. Starch
109. The biological treatment of waste water makes use of
- a. aerobic bacteria and fungi
b. anaerobic bacteria and algae
c. aerobic and anaerobic bacteria
d. anaerobic bacteria and eucalyptus leaves
110. A similarity among black buck, gharial, rhinoceros and marsh crocodile is that they are
- a. animals with thick chitinous skin
b. oviparous
c. endangered species
d. found in the forests of North-East India

111. The nasal openings in human beings are comparable to
a. gills of fish *b.* blood vessels in an earthworm
c. spiracles of the cockroach *d.* root hairs of plants
112. Rani had an uneven plot of land in which water was scarce. What system could she adopt for irrigation?
a. Canal *b.* Sprinkler *c.* Drip *d.* Hand pump
113. Ram was going through a forest and found many similar plants. What amongst the given below could be reason for the observed phenomenon. The plants are
 I. of many genera
 II. of only one species
 III. capable of interbreeding
 IV. capable of crossbreeding
 Select the correct alternative.
a. I and II *b.* II and III *c.* III and IV *d.* I and IV

114. Match the following

List I	List II
A. Edward Jenner	1. Heredity
B. Chromosomes	2. Budding
C. <i>Hydra</i>	3. Protein biosynthesis
	4. Smallpox vaccine
	5. Cell membrane
	6. Binary fission
	7. Antibiotics

Codes

- | | | | |
|-----------------|-----------------|-----------------|-----------------|
| ABC | ABC | ABC | ABC |
| <i>a.</i> 7 1 2 | <i>b.</i> 4 1 2 | <i>c.</i> 7 5 6 | <i>d.</i> 4 2 6 |
115. Which of the following has the same monomer unit?
a. Nylon and cellulose *b.* Polyester and nylon *c.* Rayon and nylon *d.* Cellulose and rayon
116. Which of the following will be suitable for coating dress materials of fire-men?
a. Nylon *b.* Polyester *c.* Melamine *d.* Acrylic
117. A highly reactive element X is stored under water. It readily reacts with oxygen of air to give a compound Y, which dissolves in water. The aqueous solution of Y changes blue litmus solution to red. The element X is
a. sodium *b.* sulphur *c.* phosphorous *d.* potassium

118. Two elements A and B on burning in air give corresponding oxides. Oxides of both A and B are soluble in water. The aqueous solution of oxide of A is alkaline and reacts with aqueous solution of oxide of B to give another compound. Identify A and B.
a. A and B both are metals *b.* A and B both are non-metals
c. A is metal and B is non-metal *d.* A is non-metal and B is metal

119. Match the following

List I (Fraction of Petroleum)	List II (Main Uses)
A. Kerosene	1. Metalling of roads
B. Diesel	2. Jet aircraft fuel
C. Paraffin wax	3. Generation of electricity
D. Bitumen	4. Lubricants

Codes

A B C D

A B C D

A B C D

A B C D

a. 1 2 3 4*b.* 1 3 4 2*c.* 2 3 4 1*d.* 4 2 3 1

- 120.** Coal is a fossil fuel and it cannot be prepared in a laboratory or industry because the formation of coal
- I. is a very slow process.
 - II. needs very low pressure and low temperature.
 - III. needs very high pressure and high temperature.
 - IV. causes air pollution.
- Select the correct alternative.
- a.* I and II *b.* II and IV *c.* III and I *d.* IV and III
- 121.** The necessary conditions for combustion process to occur are
- I. availability of air/oxygen.
 - II. availability of air/oxygen and fuel.
 - III. temperature of fuel below ignition temperature.
 - IV. temperature of fuel above ignition temperature.
- Select the correct alternative.
- a.* I and II *b.* II and IV *c.* III and I *d.* IV and I
- 122.** The gaseous fuels
- I. burn without producing smoke.
 - II. have low calorific value.
 - III. are easy to ignite.
 - IV. have high calorific value.
- Select the correct alternative.
- a.* I and II *b.* II and III *c.* III and IV *d.* IV and II
- 123.** Which of the following air pollutants reduces the oxygen-carrying capacity of blood?
- a.* Carbon dioxide *b.* Carbon monoxide *c.* Sulphur dioxide *d.* Nitrous oxide
- 124.** Which of the following are responsible for causing acid rain?
- a.* Oxides of sulphur and carbon dioxide *b.* Oxides of nitrogen and carbon monoxide
- c.* Hydrogen sulphide and carbon dioxide *d.* Oxides of sulphur and nitrogen
- 125.** On washing with soap, a turmeric stain on the cloth turns to red because
- I. soap solution is alkaline
 - II. soap solution is acidic
 - III. turmeric contains a natural indicator
 - IV. turmeric contains litmus
- Select the correct alternative.
- a.* I and III *b.* II and IV *c.* III and II *d.* I and IV
- 126.** Which of the following are used as an anti-acid to reduce acidity to reduce acidity in stomach?
- a.* Sodium carbonate and magnesium hydroxide
- b.* Magnesium hydroxide and sodium hydroxide
- c.* Sodium bicarbonate and calcium hydroxide
- d.* Sodium bicarbonate and magnesium hydroxide
- 127.** Which of the following is a chemical change?
- a.* Melting of ice *b.* Burning of magnesium in air
- c.* Dissolution of sugar in water *d.* Blowing of wind

128. By blowing between two balloons hanging close to each other, you observe that they come closer. A similar phenomenon is seen in

- a.* the lifting of an aeroplane
b. kite flying
c. the lifting of balloon filled with
d. take off of rocket

129. A stone tied to a string is whirled in a circle. As it is revolving, the string suddenly breaks. The stone, then

- a.* flies off radially outwards
b. flies off radially inwards
c. flies off tangentially
d. moves in a circle of larger radius

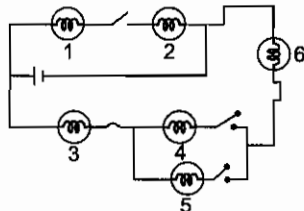
130. A person moves a certain distance in a certain time. If $\frac{1}{3}$ of the distance is covered in $\frac{2}{3}$ of the time with speed v_1 and the rest of the $\frac{2}{3}$ distance in $\frac{1}{3}$ of the time speed v_2 , then $\frac{v_1}{v_2}$ is

- a.* $\frac{1}{2}$
b. $\frac{1}{4}$
c. $\frac{4}{9}$
d. $\frac{2}{9}$

131. In an experiment, it was observed that when the length of a wire in an electrical circuit is doubled, everything else remaining same, the current becomes half. On the other hand, if the thickness (diameter) of the wire is doubled, the current becomes 4 times. Two wires W_1 and W_2 of the same metal have the same current passing through them. The thickness of wire W_2 is twice that of W_1 , then the length of the wire W_2 is

- a.* sixteen times that of wire W_1
b. four times that of wire W_1
c. two times that of wire W_1
d. same as that of wire W_1

132. In the electric circuit shown below.



- a.* All the bulbs will glow
b. Bulbs 4, 5 and 6 will glow
c. Only bulb 3 will glow
d. None of the bulbs will glow

133. A printed page is seen through a glass slab place on it. The printed words appear raised. This is due to

- a.* refraction at the upper surface of the slab
b. refraction at the lower surface of the slab
c. partial reflection at the upper surface of the slab
d. partial reflection at the lower surface of the slab

134. Two mirrors are placed at right angles to each other as shown in the figure. Total number of images of an object O placed between them, that are seen as



- a.* two
b. three
c. four
d. six

135. Match the following

List I	List II
A. Going up an inclined plane is more tiring than walking on a horizontal plane	1. Magnetic force
B. It is difficult to inflate balloon beyond a certain point	2. Pressure
C. Waling on a sandy beach is more tiring than waling on a road	3. Gravitational force
D. A compass needle always points in the North-South direction	4. Friction

Codes

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

136. Consider the following statements

- I. Grease is used to reduce friction in bicycle chain.
- II. Ball bearings are used to reduce friction in a fan.
- III. Oil can be used to increase friction in a car engine.
- IV. Talc can be used to reduce friction when an object is sliding on a surface.

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

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

137. If one puts ones ears to the steel rail, the sound of a coming train can be heard even when the train cannot be seen. One can conclude from this observation that

- I. sound travels faster in steel than in air.
- II. amplitude of sound in the rail is much larger than in air.
- III. sound can travel larger distances in solids than in air.
- IV. quality of sound in rail is better than in air.

The reasonable conclusions are

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

138. Quality depends on

a. intensity *b.* loudness *c.* timbre *d.* frequency

139. Given that there is a relationship between the orbital radius of a planet and its period of revolution and that the periods of revolution of Mercury, Earth, Jupiter and Neptune are nearly 0.24, 1, 11.8 and 165 years. It follows that the period of revolution of

- I. Venus is less than 0.24 years
- II. Mars is less than 12 years
- III. Uranus is more than 165 years
- IV. Uranus is less than 165 years but more than 12 years

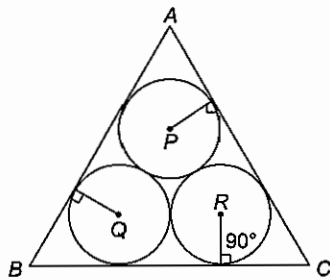
The correct statement (s) is/are

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

140. Lunar eclipse occurs when earth comes in between Sun and the Moon. Solar eclipse occurs when Moon comes in between Sun and Earth. This suggests that

- a.* both eclipses occurs on a new Moon day
- b.* solar eclipse occurs on a new Moon day and lunar eclipse on a full Moon day
- c.* lunar eclipse occurs on a new Moon day and solar eclipse on a full Moon day
- d.* both eclipses occur on a full Moon day

141. Which is the greatest number amongst $2^{\frac{1}{2}}, 3^{\frac{1}{3}}, 8^{\frac{1}{8}}$ and $9^{\frac{1}{9}}$?
a. $9^{\frac{1}{9}}$ *b.* $8^{\frac{1}{8}}$ *c.* $3^{\frac{1}{3}}$ *d.* $2^{\frac{1}{2}}$
142. If the product of two numbers is 21 and their difference is 4, then the ratio of the sum of their cubes to the difference of their cubes is
a. 185 : 165 *b.* 165 : 158 *c.* 185 : 158 *d.* 158 : 145
143. In a quadrilateral ABCD, if $AB \parallel CD$, $\angle D = 2\angle B$, $AD = b$ and $CD = a$, then the side AB is of length
a. $\frac{a}{2} + 2b$ *b.* $a + 2b$ *c.* $2a - b$ *d.* $a + b$
144. Two candles have different lengths and thickness. The shorter lasts 11 h and the longer 7 h when both are lit simultaneously. If after 3 h of their being lit together at the same time, both have the same length, then the ratio of their original lengths is
a. 5 : 8 *b.* 11 : 14 *c.* 10 : 13 *d.* 7 : 11
145. A lady reaches her office 20 min late by travelling at a speed of 20 km/h and reaches 15 min early by travelling at 30 km/h. By how much time will she be early or late, if she travels at 25 km/h?
a. 1 min early *b.* 5 min early *c.* 1 min late *d.* 5 min late
146. Three circles each of radius r units are drawn inside an equilateral triangle of side a units, such that each circle touches the other two and two sides of the triangle as shown in the figure, (P, Q and R are the centres of the three circles). Then, relation between r and a is



- a.* $a = 2(\sqrt{3} + 1)r$ *b.* $a = (\sqrt{3} + 1)r$ *c.* $a = (\sqrt{3} + 2)r$ *d.* $a = 2(\sqrt{3} + 2)r$
147. Unit's digit in the number $(12357)^{655}$ is
a. 1 *b.* 3 *c.* 7 *d.* 9
148. If a cube has surface area S and volume V , then the volume of the cube of surface area $2S$ is
a. $\sqrt{2}V$ *b.* $2V$ *c.* $2\sqrt{2}V$ *d.* $4V$
149. $\triangle ABC$ is a triangle with $AB = AC$ and $BC = 9$ cm. If the height from A to BC is 6 cm, then the height from C to AB (in cm), is
a. 6.0 *b.* 7.2 *c.* 7.5 *d.* 8.0
150. How many pairs of natural numbers are there so that difference of their squares is 60?
a. 4 *b.* 3 *c.* 2 *d.* 1
151. The sum of any three distinct natural numbers arranged in ascending order is 200 such that the second number is a perfect cube. How many possible values are there for this number?
a. 4 *b.* 3 *c.* 2 *d.* 1

152. If the digits of a three-digit number are reversed, then the number, so obtained is less than the original number by 297. If the sum of the digits of the number is 8 and its hundred's digit has the largest possible value, then the ten's digit of the number is
a. 3 *b.* 2 *c.* 1 *d.* 0
153. If the sum of all the angles of a polygon except one angle is 2220° , then the number of sides of the polygon is
a. 12 *b.* 13 *c.* 14 *d.* 15
154. ABCD is a quadrilateral whose diagonals intersect each other at the point O such that $OA = OB = OD$. If $\angle OAB = 30^\circ$, then the measures of $\angle ODA$ is
a. 30° *b.* 45° *c.* 60° *d.* 90°
155. A shopkeeper purchased 300 pens and sold one out of four pens at no loss or profit. He sold the remaining pens at a profit of 20%. What is his overall profit or loss per cent on the whole transaction?
a. 15% profit *b.* 15% loss *c.* 12% profit *d.* 12% loss
156. The value of the expression $\sqrt{34 - 24\sqrt{2}} \times (4 + 3\sqrt{2})$ is
a. -2 *b.* 2 *c.* 3 *d.* 4
157. If $aabb$ is a four-digit number and also a perfect square, then the value of $a + b$ is
a. 12 *b.* 11 *c.* 10 *d.* 9
158. For the data 1, 2, 2, 3, 3, 3, 4, 4, 4, 4, ..., 9, 9, the product of mean and mode equals to
a. 9 *b.* 45 *c.* 57 *d.* 285
159. AD is a diameter of a circle. Two more circles pass through A and intersect AD in B and C respectively, such that AB and AC are diameters of these circles and $AD > AC > AB$. If the circumference of the middle circle is average of the circumference of the other two, then given $AB = 4$ units and $CD = 2$ units, what is the area, (in sq units) of the largest circle?
a. 128π *b.* 64π *c.* 48π *d.* 16π
160. If the sum of three consecutive odd numbers is a perfect square between 200 and 400, then the root of this sum is
a. 15 *b.* 16 *c.* 18 *d.* 19
161. Consider the following processes
 I. Mobilise the revenue resources.
 II. Redefine the land rights of the people.
 III. Produce the cash crops it required.
 IV. Annexed the territory.
 Which process did the English East India Company follow just after acquiring the Diwani rights in Bengal from the Mughal emperor?
a. I and III *b.* I and II *c.* I, II and III *d.* All of these
162. Which of the following is correct?
a. Patola is a cotton cloth with gold thread
b. Chintz is a printed fine cloth with design
c. Jamdani is a silk cloth with gold thread and embroidery
d. Bandanna is a fine cloth with decorative motifs on it

163. Match the following

List I	List II
A. James Mill	1. Founded the Asiatic Society of Bengal
B. William Carey	2. Criticized the orientalist
C. William Jones	3. Surveyed the progress of education in vernacular schools
D. William Adam	4. Established the Serampore Mission

Codes

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

164. Which of the following statements regarding the Act of 1858 is incorrect?
- The English East India Company continued to enjoy trading monopolies in India
 - A Secretary of State for India was appointed with an India Council to advise
 - The British Crown became the direct ruler of India
 - The Governor-General was given the title of the Viceroy
165. Why was the Delhi Durbar organised in 1877 with pomp and show?
- The Viceroy wanted to display the wealth and prosperity of India
 - The British wanted to threaten the people by displaying their army strength
 - The British wanted to replace the Mughal emperor from the minds of the people as their rulers
 - The Viceroy wanted to appease Queen Victoria
166. Arrange the following social reform organisation chronologically on the basis of their foundation.
- Arya Samaj
 - Prarthana Samaj
 - Veda Samaj
 - Sree Narayan Dharma Pariplana Yogam
- The correct sequence should be
- I, IV, III, II
 - I, II, III, IV
 - IV, III, II, I
 - III, II, I, IV
167. Why did the cotton factories in India grow during the World War I?
- Masses refused to wear foreign clothes because of Swadeshi appeal
 - Textile imports from Britain declined because the demand of military supplies from Indian factories increased
 - The Government in England lowered the import duties on Indian cotton textiles
 - The Indian cotton industries started producing cotton clothes at competitive prices
168. **Assertion (A)** William Jones and Colebrooke went about discovering the ancient texts of India.
Reason (R) Because they were orientalist.
- A is not correct but R is correct
 - A is correct but R is not correct
 - A is correct and R is the correct explanation of A
 - Both A and R are correct but R is not the correct explanation of A
169. The first Anglo-Burmese War concluded by a treaty. Which one among the following is that?
- Treaty of Burme
 - Treaty of Tamu
 - Treaty of Bhama
 - Treaty of Yandaboo

- 170.** Find out the incorrect statement.
- The European artists brought with them new styles and new conventions of painting
 - The European artists brought with them the idea of realism
 - The European used oil painting which produced images that looked real
 - The European artists learnt the technique of oil painting from the Indian artists

- 171.** Which Five Year Plan gave the maximum thrust on the industrial growth?
- First Five Year Plan
 - Second Five Year Plan
 - Third Five Year Plan
 - Fourth Five Year Plan

- 172.** Match the following.

List	Subjects
A. Central List	1. Railways
B. State List	2. Health
C. Concurrent List	3. Foreign affairs
D. Residuary List	4. Water disputes

Codes

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

- 173.** Consider the following statements
- It is a constitutional body created by the Parliament Commission.
 - It acts as an advisory body to the Union Government.
 - The Finance Minister is the ex-officio chairman of this body.
 - Its basic function is to formulate priorities for the Five Year Plan for integrated economic and social development.

Which of the above statements is/are correct about the Planning Commission?

- I and III
- II and IV
- I, III and IV
- Only IV

- 174.** What does the 'mixed economy' in India mean?
- Companies of foreign countries can play an equal role in development of India's economy
 - Special privileges are given to foreign companies by the government for investment in India
 - Private companies of India are allowed to invest in public sector
 - Private sectors play a complementary role along with the public sector

- 175.** Non-alignment Movement which was the basis of Nehru's foreign policy meant that
- India would remain neutral in world politics
 - India would not participate in any way, not even as mediator, to end conflicts between USA and the Soviet Union
 - India would not participate in power rivalries and ideological conflicts between the USA and the Soviet Union
 - India, along with other like minded Asian and African countries, would create an equally strong third front in world politics in opposition to both the USA and the Soviet Union

- 176.** Which of the following best describes 'jet streams'?
- Wind system with seas and reversal of direction
 - Wind blowing from sub tropical high pressure belts towards the tropical low pressure belts
 - Narrow meandering bands of winds which blow in mid latitude near the tropopause and encircle the globe
 - Winds blowing from the tropical high pressure belts towards the equatorial low pressure belts

177. Intense damage was caused in Ladakh in 2010, due to which natural calamity?
a. Mud flow *b.* Landslide *c.* Earthquake *d.* Drought
178. Which of the following comes under the category of 'Footloose Industry'?
a. Iron and steel *b.* Cotton textile
c. Information technology *d.* Petro-chemical
179. Match the following

List I	List II
A. Mining	1. Maharashtra
B. Deforestation	2. Jharkhand
C. Overgrazing	3. Punjab
D. Over irrigation	4. Madhya Pradesh

Codes

- | | | | |
|-------------------|-------------------|-------------------|-------------------|
| A B C D | A B C D | A B C D | A B C D |
| <i>a.</i> 2 4 1 3 | <i>b.</i> 1 2 3 4 | <i>c.</i> 3 2 1 4 | <i>d.</i> 2 3 1 4 |

180. 'Wheat requires moderate temperature and rainfall during growing season and bright sunshine at the time of harvest.' Which other crop requires the same geographic conditions?
a. Rice *b.* Maize *c.* Mustard *d.* Jute
181. Fundamental Rights
a. can never be suspended *b.* can be suspended in case of criminal
c. can be suspended during emergency activities *d.* None of these
182. Given below are some factors influencing the location of certain industries.
 I. Skilled labour II. Low transportation cost
 III. Clean and dust free environment IV. Availability of raw material
 V. Government policy
- Which among these have more strongly influenced location of IT industry in India?
a. I, II and III *b.* II, III and IV *c.* III, IV and V *d.* I, III and V
183. Consider the following industrial regions of India
 I. Hooghly industrial region II. Gurgaon-Delhi-Meerut industrial region
 III. Ahmedabad-Baroda industrial region IV. Mumbai-Pune industrial region
 V. Bengaluru-Tamil Nadu industrial region VI. Chotanagpur industrial region
 VII. Vishakhapatnam-Guntur industrial region
- Which of these lies outside peninsular India?
a. I, II, IV and VI *b.* II, III, IV and VI *c.* II, IV, VI and VII *d.* I, II, III and VI
184. The following list of towns, where steel plants are located in India.
 I. Bhilai II. Jamshedpur III. Durgapur IV. Bhadravati
 V. Rourkela VI. Bokaro VII. Salem VIII. Vijay Nagar
- Which of the following sequence is located within South India?
a. III, IV and VI *b.* I, IV and VIII *c.* IV, VII and VIII *d.* V, VII and VIII
185. Fundamental Rights are taken from
a. UK *b.* US *c.* Ireland *d.* Japanese
186. **Assertion (A)** The tropical rainforests are mostly evergreen.
Reason (R) The regions of tropical rainforests get abundant rainfall and have low temperature through the region.
a. Both A and R are true and R explains A *b.* Both A and R are true but R does not explain A
c. A is true but R is false *d.* A is false but R is true

- 187.** Consider the following statements
 I. In India, cropland occupies 57% of total area.
 II. Pastures account for 56% area in Australia.
 III. About 2/3rd area in Japan is under forests.
 What should be understood from the above statements?
 a. India has an efficient land use system while most of the land in Australia and Japan is rendered waste
 b. India has subsistence agricultural economy, animal husbandry is the main stay of economy in Australia and forestry is main activity in Japan
 c. Most of the cultivation; in Australia cultivation of crops is confined to small proportion and most of the land is used for grazing. Japan has conserved its forest resources
 d. India has a faulty land used system, Australia has extensive land use and Japan has small cultivable land
- 188.** Consider the following statements
 I. In the Tundra region, animals have thick fur the thick skin.
 II. Most of the animals in grasslands are herbivores.
 III. In tropical rainy forests, many animals live on trees.
 Which of the following best explains these statements?
 a. Dependence of animals on natural vegetation
 b. Exploitation of wildlife and natural vegetation
 c. Relationship between density of vegetation and wildlife
 d. Adaptation of natural environment
- 189.** Which one of the following is not a part of U.N.O?
 a. General Assembly b. UNESCO c. IMF d. ILO
- 190.** Mulching is associated with use of
 a. material to maintain soil moisture b. soil to build barrier
 c. trenches to collect water d. piled up rocks to slow down the flow of water
- 191.** High Court in the following cities were established at one time or the other. Identify the sequence in which they appeared.
 I. Allahabad II. Bombay (now Mumbai)
 III. Delhi IV. Nainital
 The sequence should be
 a. I, III, IV, II b. III, IV, I, II c. II, I, III, IV d. IV, II, I, III
- 192.** Fundamental Law of the Land is called
 a. State b. Constitution c. Parliament Act d. Ordinance
- 193.** India is a
 I. Socialist II. Secular
 III. Sovereign IV. Democratic Republic
 Identify the correct sequence as maintained in the Preamble of the Indian Constitution.
 a. III, I, II, IV b. II, III, I, IV c. III, I, IV, II d. I, II, III, IV
- 194.** Right to the enjoyment of pollution free water as interpreted by the Supreme Court in Subhash Kumar Vs. State of Bihar (1991) falls under
 a. Right to Equality b. Right to Liberty
 c. Right against Exploitation d. Right to Life and Personal Liberty
- 195.** Freedom of media is guaranteed under
 a. Liberal system b. Rule by the proletariat
 c. Benevolent ruler d. Religious ruler

- 196.** Economic presence of the government in social realm is found under
a. Fundamental Rights *b.* Fundamental Duties
c. Directive Principles of State Policy *d.* Policy for determining citizenship
- 197.** **Assertion (A)** The people in between the producers and the final consumers are traders.
Reason (R) The people who finally sell the commodities to the consumers are retailers.
a. Both A and R are true and R is the correct explanation of A
b. Both A and R are true and R is not the correct explanation of A
c. A is true but R is false
d. A is false but R is true
- 198.** The Principle of 'Checks and Balances' is related to
a. Rule of Law *b.* Fundamental Law *c.* Fundamental Duties *d.* Separation of Powers
- 199.** Which one of the following is not an elected member of the House?
a. Speaker of the Lok Sabha *b.* Deputy Speaker of the Lok Sabha
c. Chairman of the Rajya Sabha *d.* Deputy Chairman of the Rajya Sabha
- 200.** India has
a. basic democracy *b.* controlled democracy
c. guided democracy *d.* liberal democracy

Paper I : Mental Ability Test

1. (a) All sparrow but six means that six of the birds were not sparrow.

Similarly, for ducks and pigeons

$$\text{So, pigeons} + \text{sparrow} = 6$$

$$\text{pigeons} + \text{ducks} = 6$$

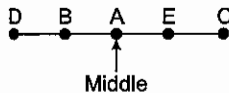
$$\text{ducks} + \text{sparrow} = 6$$

$$\text{So, total birds} = 3 + 3 + 3 = 9 \text{ birds}$$

2. (c) Clearly, every member (except the winner) must lose one match to decide the winner.

$$\therefore \text{Total matches played must be} = 45 - 1 = 44$$

3. (b) Data is arranged as given below.



So, building A is in the middle.

4. (a) R is 16th from the right end.

W is 5th to the right of R.

$$\therefore \text{W's position from right end} = (16 - 5) = 11\text{th}$$

5. (d) The correct water image is given by options (d).

6. (b) The correct mirror image is given by option (b).

7. (b) lou (jin) → wonderful (person)

yeh (jin) → good (person)

yeh suk → good day

So, code for wonderful day is 'lou suk'.

8. (c) Pattern of series is

$$1^6 + 1, 2^5 + 2, 3^4 + 3, 4^3 + 4, 5^2 + 5, \dots$$

$$\text{So, missing term is } 5^2 + 5 = 25 + 5 = 30$$

9. (a)
$$\begin{array}{ccccccc} 4 & 24 & 49 & \boxed{84} & 134 & 204 \\ \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow \\ +20 & +25 & +35 & +50 & +70 & \\ \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \\ +5 & +10 & +15 & +20 & & \end{array}$$

Clearly, the missing term is 84.

10. (d) Adjacent faces to red are

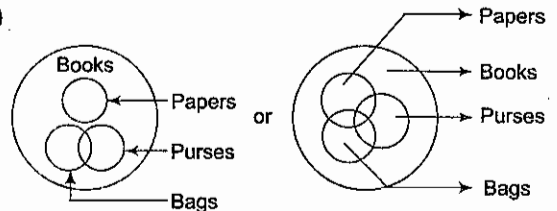
green yellow, pink and blue

So, colour opposite to face of colour red is black.

11. (a) In each row, there are three types of arrows—an arrow with a single head and without any base, an arrow with double, head having a circle at its base, an arrow with triple head having a rectangle at its base. Also, in each

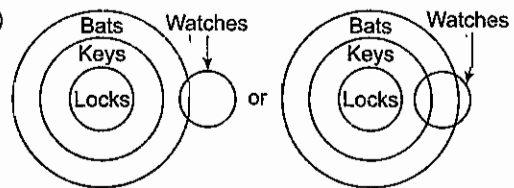
row, the arrows point in three directions upwards, downwards and towards the right.

12. (b)



(II) and (III) follow.

13. (b)



So, only I follows.

14. (b) The series is ccacc/aabaa/bcbcb/cc

15. (b) Code for R O B U S T

$$\begin{array}{cccccc} & -1 & -1 & -1 & -1 & -1 & -1 \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ Q & N & A & T & R & S & \end{array}$$

So, word for code

$$\begin{array}{cccccc} & +1 & +1 & +1 & +1 & +1 \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ A & Y & D & N & Q & \end{array}$$

16. (d) All accept (d) contains one vowel in the set of alphabets.

17. (b) In each row the alphabets are skipped by 2 and also in each row the biggest number is product of two smaller numbers.

$$\text{So, } L + 2 \rightarrow N$$

$$\text{Also, } 5 \times ? = 3$$

$$? = \frac{15}{3} = 3$$

Hence, missing term is 3N.

18. (b) As this card may help the police in case of fatal accident to inform the family member.

19. (d) As exact number of person is not given, so any exact information cannot be calculated.

20. (c) We have, $2^2 + 4^2 = 20$

$$3^2 + 9^2 = 90$$

\therefore '?' is replaced by

$$1^2 + 7^2 = 1 + 49 = 50$$

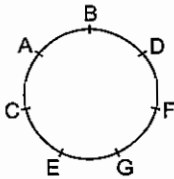
21. (d) Sum of numbers in each row is 30.

So, value of A = 9

B = 13

C = 11

Solutions (Q. Nos. 22–26) Seating arrangement can be shown as in the adjoining figure.



22. (a) B is sitting between A and D.

23. (b) GF is the pair in which F is sitting to the right of G.

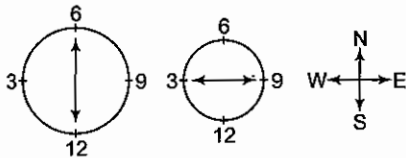
24. (a) If D and E interchange places, then D's new position will be E's initial position which is between G and C.

25. (d) F is sitting between G and D.

26. (b) B is to the immediate left of D is wrong.

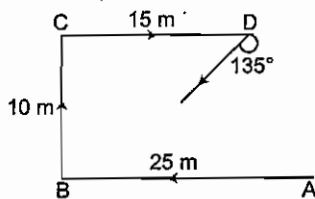
27. (b) In each row, the second figure is obtained by rotating the first figure through 90° clockwise or 90° anti-clockwise and adding a circle to it. Also, the third figure is obtained by adding two circles to the first figure (without rotating the figure).

28. (d)



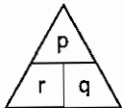
At 9 : 15 pm the minute hand will point towards West.

29. (c)



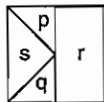
Hence, he should go in South-West direction.

30. (d)



So, figure 's' is not required to complete the figure.

31. (b)



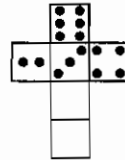
So, figure 't' is not required to complete the figure.

32. (b) The box formed will have F, A, B and D on its adjacent faces.

So, the correct figure is



33. (d) Expanded form of dice is shown as



So, on opposite face of three dots there can be either 1 or 5 dots.

34. (a) All mothers are women and some mothers and some women may be engineers.

35. (d) Educated men but not urban should be contained in triangle and rectangle both *i.e.*, 11.

36. (c) $(6 + 2) \times 2 + 1 = 17$

Also, $(1 + 4) \times 2 + 1 = 11$

So, $(3 + 7) \times 2 + 1 = \boxed{21}$

37. (b) 1st triangle

$$(7 \times 3 \times 5) - (7 + 3 + 5) = 105 - 15 = 90$$

2nd triangle

$$(6 \times 4 \times 1) - (6 + 4 + 1) = 24 - 11 = 13$$

So, for 3rd triangle

$$(8 \times 2 \times 6) - (8 + 2 + 6) = 96 - 16 = 80$$

38. (a) Series is $6 \times 2 - 4 = 8$

$$8 \times 2 + 4 = 20$$

$$20 \times 2 - 4 = 36$$

$$36 \times 2 + 4 = 76$$

$$76 \times 2 - 4 = 148$$

39. (a) In the given code,

$$Z = 1, Y = 2 \text{ and } X = 3$$

$$\text{So, } GO = 20 + 12 = 32$$

$$SHE = 8 + 19 + 22 = 49$$

$$\therefore \text{SOME} = 8 + 12 + 14 + 22 = 56$$

40. (b) Except 'b' each figure is cut into four parts.

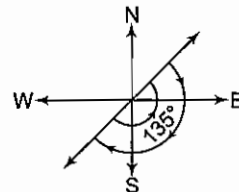
41. (c) From figure 'B' to figure 'A' the upper element gets laterally inverted; lower element gets vertically inverted. The elements at the RHS and LHS positions get related through 180° .

42. (a) As A and D are heavier than B, E and F but not the heaviest, so the heaviest must be C.

43. (b) As every second the second hand moves 6° , so in 13 s it moves by $13 \times 6 = 78^\circ$

So, its direction is 78° North of West.

44. (c)



So, finally the man is facing South-West direction.

45. (b) The correct mirror image will be given in option (b).
46. (c) Clearly, out of $(15 + 1) = 16$ persons there is one captain
So, total number of captains = $\frac{1200}{16} = 75$
47. (b) Since, each pole at the corner is common to its two sides.
So, total number of poles required = $27 \times 4 - 4 = 104$.
48. (d) Match played in one group is
 $7 + 6 + 5 + 4 + 3 + 2 + 1 = 28$
∴ Total matches in groups = $4 \times 28 = 112$
Now, these are two semi-finals and one final.
So, total matches = $112 + 2 + 1 = 115$
49. (c) Form 1st balance
 $\$ = 3.5 \star$
Form 2nd balance
 $\text{O} = 2.5 \star$
So, for third balance
 $\$ = \star + \text{O}$
 $= \star + 2.5 \star$
 $= 3.5 \star$
So, '?' must be replaced by 'O'
50. (d) For 1st figure
 $(45 - 42)^2 + (36 - 27)^2$
 $= 3^2 + 9^2$
 $= 9 + 81 = 90$
For 2nd figure
 $(79 - 74)^2 + (65 - 60)^2$
 $= 5^2 + 5^2$
 $= 25 + 25 = 50$
So, for 3rd figure
 $(87 - 82)^2 + (94 - 88)^2$
 $= 5^2 + 6^2$
 $= 25 + 36 = 61$
51. (a) The first man was 'tall, very well-dressed and soft spoken'. The other man was 'just the opposite.' So, we look for the antonyms of the three adjectives.
52. (d) By knowing whom the horse followed.
53. (b) The tall man was curious about how the Wazir had arrived at the decision. This implies that he was impressed with the latter's wisdom.
54. (d) Wazir was famous, but famous for his judgement people came to him for his fame in dispensing justice.
55. (d) The story starts on this note and one becomes famous for judgement only when one is quite intelligent.
56. (d) The third sentence of the last paragraph clearly says 'As lower-caste people had no education, they had accepted this mental slavery.....'
57. (c) Jyoti's father advised him to observe the old customs.
58. (d) The insult that Jyoti had to bear set him thinking. He analysed the problem of the lower-caste people and took measures to get rid of it through social service.
59. (c) The second sentence of the first paragraph gives the reason. 'Since, he loved his friend sincerely
60. (b) Although (c) option seems to be correct but Jyoti was unable to sleep that night because he wanted to do something for the lower-caste people.
61. (c) Udham Singh went to America, where he met his fellow citizens working for the same cause.
62. (a) He reached Paris and purchased a revolver which was used for killing Sir Michael.
63. (c) At Caxton Hall in London.
64. (d) The third sentence of the second paragraph tells us that his crime, was 'Violation of Arms Act'. The arms act is violated when one possesses unlicensed arms and ammunition.
65. (d) The second sentence of the second paragraph says that 'he returned ... in response to an urgent call from Bhagat Singh', a revolutionary in India.
66. (a) QPR
67. (c) RPQ
68. (b) Between the abundance of mosquitoes.
69. (a) Moments with enjoyment.
70. (a) Accomplish means to perform or to complete.
71. (c) Adverse means hurtful or injurious 'comments'.
72. (c) 'May' earn a living.
73. (b) 'Avail means take advantage of' therefore 'opportunity' is the best option.
74. (c) Magistrate 'issued' orders.
75. (d) 'Comprises' means consist of.
76. (b) I 'regret' to inform.
77. (c) Do not 'keep' the door open.
78. (a) 'Escaped' being run over yesterday.
79. (c) 'Unrivalled' means having no equal or 'peerless'.
80. (a) 'Knock out' means to 'make unconscious'.
81. (b) 'Pick out' means to choose or 'to select'.
82. (b) 'Rip off' means 'to cheat' or take advantage of.
83. (a) Flat footed means 'clumsy'.
84. (b) Out of tune means 'not in harmony' or agreement.
85. (d) Paint the town red means to go out and 'have a celebration'.
86. (a) One cannot say 'whether' this is true.
87. (c) Married are called 'couples'.
88. (c) Foolproof means straight forward. So, 'system' will go along with it.
89. (d) 'Sharing' the burden.

90. (a) 'Being' dumped.
91. (a) Had 'long' been propagated.
92. (b) 'By' the
93. (b) Feminist 'lobby' means a group of journalist of women welfare.
94. (d) Durable
95. (a) Diseases are 'transmitted'.
96. (c) 'Greatful' to all her guests.
97. (b) 'Assured' means to make a person sure or make safe.
98. (a) 'Pamper' means to be 'indulgent', so better antonym will be 'scold'.
99. (a) Vague means unclear, 'Transparent means through which we can see and apparent means outwardly clear'.
100. (c) 'Lavish' means when lot of money is spent. While 'frugal' means sparingly used or supplied, meagre or costing little.

Paper II : Scholastic Aptitude Test

101. (d) Growth of seeds require nutrients, therefore very little growth in pot A but lot of growth in B and C because B and C have good amount of nutrients in the soil in the form of humus and chemical fertilizers.
102. (d) The mixture show fermentation by yeast and the end products are ethyl alcohol and carbon dioxide.

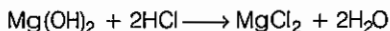
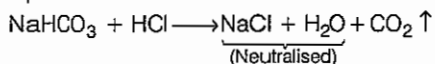
$$C_6H_{12}O_6 \xrightarrow{\text{Fermentation}} 2C_2H_5OH + 2CO_2$$
 Yeast ethyl alcohol carbon dioxide
103. (b) RBCs have haemoglobin. It is a protein pigment that carries oxygen to different parts of the body.
104. (a) The cotton plant is a source for many important products other than fabric while others are animal products.
105. (d) Leguminous plants (gram) have the nitrogen fixing bacteria *Rhizobium* in their root nodules therefore, the rotation of leguminous plants reduced the dependence on use of chemical fertilizers.
106. (a) By plants the CO_2 taken through stomata is used in photosynthesis and the O_2 release from photosynthesis is used in respiration, while the loss of water vapour form through stomata is called transpiration.
107. (d) The transfer of pollen from a male reproductive structure (an anther or male one) of a female reproductive structure (a stigma or female one) to the same plant or of the same flower. Self-pollination tends to decrease the genetic diversity in a population.
108. (b) Glucose is a source of instant energy as respiration process starts with glucose.
109. (c) The biological treatment of waste water makes use of aerobic and anaerobic bacteria at secondary treatment level.
110. (c) Endangered species is a population of organisms which is at rest of becoming extinct. Black buck, gharial, rhinoceros and marsh crocodile are listed under endangered species of IUCN.
111. (c) Spiracles are air channels present in cockroach (arthropods) and are comparatively similar structure to human trachea.
112. (b) For irrigation of an uneven plot of land sprinkler system is the best. Sprinkler irrigation is a method of applying irrigation water, which is similar to rainfall. It is designed to ensure maximum water saving.
113. (b) The plants of a species are relatively similar and capable of interbreeding. Most of the plants of the forest may be related to the same species or produced by the hybridisation.
114. (b) Edward Jenner developed the smallpox vaccine. Chromosomes are essential for heredity. Mode of reproduction in *Hydra* is budding.
115. (d) Rayon is purified cellulose. Thus, the monomer of rayon and cellulose is same.
116. (c) Because it can withstand high temperature.
117. (c) Since, Y changes the colour of blue litmus red, it is an acidic oxides. (Oxides of metals like Na, K are basic and oxides of non-metals like sulphur (S), phosphorous etc. are acidic). Thus, element X may be sulphur or phosphorus. From sulphur and phosphorus, sulphur is less reactive, so X is phosphorous.
 The reactions are as follows

$$\begin{array}{c} P \\ X \\ P_4O_{10} \end{array} + 5O_2 + P_4O_{10} \longrightarrow \begin{array}{c} 4H_3PO_4 \\ \text{Phosphoric acid} \\ \text{(It turns blue litmus red)} \end{array}$$
- Remember! sodium and potassium reacts with water, so these are stored in kerosene oil.
118. (c) A is metal because the oxide of metal dissolves in H_2O to form alkali. It is reacting with aqueous solution of oxide B, this is an acid because alkali-alkali reaction is not possible.
119. (c) 120. (c)
121. (b) Fuel, oxygen or air and a temperature higher than the ignition temperature of the fuel is required for the combustion process.
122. (c)
123. (b) CO has higher affinity to haemoglobin which is almost 200 times more as compared to oxygen. Thus, it reduces the oxygen carrying capacity of blood.

124. (d) Because oxides of sulphur and nitrogen when reacts with water form sulphuric and nitric acids respectively which are strong acids.

125. (a) Turmeric contains natural indicator, which turns red in alkaline solution.

126. (c) Acidity of stomach has to be neutralised by a mild base, without affecting the cells of the body. Sodium bicarbonate and magnesium hydroxide being mild base are helpful for that.



127. (b) Burning of Mg is a chemical change as a new compound (product) is obtained in this process. Moreover, it is an irreversible process.

128. (a) Due to pressure difference.

129. (c) Flies off tangentially.

130. (b) Suppose total distance of person = x

and taking total time = t

For the first condition

Given, $t_1 = \frac{2}{3}t$, $x_1 = \frac{x}{3}$

$$\therefore \text{Speed } v_1 = \frac{x_1}{t_1} = \frac{x \times 3}{3 \times 2t_1}$$
$$= \frac{x}{2t_1}$$

For the second condition

Given,

$$t_2 = \frac{1}{3}t$$

and $x_2 = \frac{2}{3}x$

$$\therefore \text{Speed } v_2 = \frac{x_2}{t_2} = \frac{2x \times 3}{3t}$$
$$= \frac{2x}{t}$$

$$\text{Therefore, } \frac{v_1}{v_2} = \frac{x/2t}{2x/t} = \frac{1}{4}$$

131. (b) Given,

Diameter of wire W_2 , = Diameter of wire W_1

$$d_2 = 2d_1$$

According to question,

Both wire have the same current.

So, resistance of both wires will be same

$$R_1 = R_2 \rho_1 \frac{l_1}{A_1} = \rho_2 \frac{l_2}{A_2}$$
$$\rho \frac{l_1}{A_1} = \rho \frac{l_2}{A_2} \quad (\because \text{metal is same})$$
$$\frac{l_1}{\pi r_1^2} = \frac{l_2}{\pi r_2^2}$$

$$\text{or } \frac{l_1}{\left(\frac{d_1}{2}\right)^2} = \frac{l_2}{\left(\frac{d_2}{2}\right)^2}$$

$$\text{or } \frac{l_1}{(d_1)^2} = \frac{l_2}{(2d_1)^2}$$

$$\therefore l_2 = 4l_1$$

Therefore, the length of the wire W_2 is four times that of wire W_1 .

132. (d) Circuit is open so none of the bulbs will glow.

133. (a) Refraction at the upper surface of the slab.

134. (b) Angle between mirrs, $\theta = 90^\circ$

$$\text{Number of images} = \left(\frac{360}{\theta} - 1 \right)$$
$$= \left(\frac{360}{90} - 1 \right) = 3$$

135. (b) 136. (a) 137. (a) 138. (c)

139. (d) 140. (b)

141. (c) LCM of (2, 3, 8, 9) = 72

$$\therefore 2^2 = 2^{\frac{36}{72}} = (2^{36})^{\frac{1}{72}}$$
$$3^3 = 3^{\frac{24}{72}} = (3^{24})^{\frac{1}{72}}$$
$$8^8 = 8^{\frac{9}{72}} = (8^9)^{\frac{1}{72}}$$

$$= (2^{27})^{\frac{1}{72}}$$

and $9^9 = 9^{\frac{8}{72}} = (9^8)^{\frac{1}{72}}$

$$= (3^{16})^{\frac{1}{72}}$$

Hence, the greatest number amongst them is

$$= 3^3$$

142. (c) Let the two numbers be x and y .

According to the question,

$$x - y = 4, xy = 21$$

Now, $x^3 - y^3 = (x - y)(x^2 + y^2 + xy)$

$$= (x - y)[(x - y)^2 + 3xy]$$

$$= 4(16 + 63)$$

$$= 4 \times 79 = 316$$

Also, $x - y = 4$

$$\Rightarrow x^2 + y^2 - 2xy = 16$$

$$\Rightarrow (x + y)^2 - 4xy = 16$$

$$\Rightarrow (x + y)^2 = 16 + 4 \times 21 = 100$$

$$\Rightarrow x + y = 10$$

$$\therefore x^3 + y^3 = (x + y)(x^2 + y^2 - xy)$$

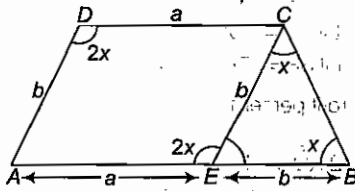
$$= 10(16 + 21) = 10 \times 37 = 370$$

$$\begin{aligned} \therefore \text{Ratio} &= 370 : 316 \\ &= 185 : 158 \end{aligned}$$

143. (d) Let $\angle B = x$, then $\angle D = 2x$

Now, we draw a line CE , which is parallel to AD .

$\therefore AECD$ is a parallelogram.



In $\triangle EBC$, $2x$ is an exterior angle.

$$\therefore \angle EBC = \angle ECB = x$$

$$\Rightarrow EC = EB = b$$

$$\therefore AB = AE + EB = a + b$$

144. (d) Let l_1, l_2 and T_1, T_2 be the respective lengths and time.

$$\text{Since, } l \propto \frac{1}{T}$$

$$\therefore \frac{l_1}{l_2} = \frac{7}{11}$$

145. (a) Let $\text{Speed}_1 = 20 \text{ km/h}$, $\text{Speed}_2 = 30 \text{ km/h}$

$$\therefore S = \frac{d}{t}$$

$$\therefore 20 = \frac{d}{t + \frac{20}{60}}, 30 = \frac{d}{t - \frac{15}{60}}$$

$$\Rightarrow d = 20t + \frac{20}{3}$$

$$d = 30t - \frac{15}{2}$$

$$\therefore 20t + \frac{20}{3} = 30t - \frac{15}{2}$$

$$\Rightarrow -10t = \frac{-45 - 40}{6} = \frac{-85}{6}$$

$$\Rightarrow t = \frac{85}{6 \times 10} = \frac{17}{12} \times 60 = 85 \text{ min}$$

$$\therefore d = 20 \times \frac{17}{12} + \frac{20}{3} = \frac{170}{6} + \frac{20}{3}$$

$$= \frac{85}{3} + \frac{20}{3} = \frac{105}{3} = 35 \text{ km}$$

$$\therefore \text{Time taken} = \frac{35}{25} = \frac{7}{5} \times 60 = 84 \text{ min}$$

Hence, it reaches 1 min early.

146. (a) Since, $\triangle ABC$ is an equilateral.

$$\therefore \angle A = \angle B = \angle C = 60^\circ$$

$$\text{Also, } MN = QR = 2r$$

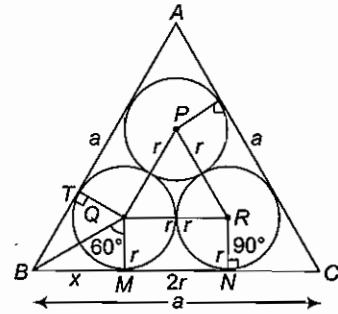
In quadrilateral $BTQM$,

$$\angle B + \angle BMQ + \angle MQT + \angle QTB = 360^\circ$$

$$\Rightarrow 60^\circ + 90^\circ + 90^\circ + \angle QTB = 360^\circ$$

$$\Rightarrow \angle QTB = 120^\circ$$

$$\begin{aligned} \therefore \triangle BTQ &\cong \triangle BQM \\ \Rightarrow \angle TQB &= \angle MQB = 60^\circ \end{aligned}$$



$$\text{In } \triangle BQM, \tan 60^\circ = \frac{BM}{QM} = \frac{x}{r}$$

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

$$\text{Similarly, } CN = r\sqrt{3}$$

$$\text{Now, } BC = BM + MN + CN = a$$

$$\Rightarrow 2x + 2r = a$$

$$\Rightarrow 2(x + r) = a$$

$$\Rightarrow 2(r\sqrt{3} + r) = a$$

$$\Rightarrow a = 2r(\sqrt{3} + 1)$$

147. (b) Unit digit of $(12357)^{655}$

$$= \text{Unit digit of } (7^{655}) = 7^4 \times 163 + 3$$

$$= 7^4 \times 163 \times 7^3 = \text{Unit digit is } (1 \times 3)$$

$$= \text{Unit digit is } 3.$$

$$(\because 7^1 = 7, 7^2 = 49, 7^3 = 343, 7^4 = 2401)$$

148. (c) Let side of a cube be a .

$$\text{Surface area of cube, } S = 6a^2$$

$$\text{and volume of cube, } V = a^3$$

\Rightarrow The length of each edge is a .

$$\text{Let } S' = 2S = 12a^2$$

$$= 6(\sqrt{2}a)^2$$

$$\therefore \text{Length of each edge} = (\sqrt{2}a)$$

\therefore Required volume

$$= (\sqrt{2}a)^3 = 2\sqrt{2}a^3 = 2\sqrt{2}V$$

149. (b) Area $(\triangle ABC) = \frac{1}{2} \times BC \times AE = \frac{1}{2} \times 9 \times 6 = 27 \text{ cm}^2$

$$\text{In right angle } \triangle ABE, AB = \sqrt{6^2 + \left(\frac{9}{2}\right)^2}$$

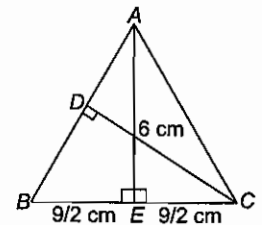
$$= \sqrt{36 + \frac{81}{4}} = \sqrt{\frac{225}{4}} = \frac{15}{2} \text{ cm}$$

Now, Area $(\triangle ABC)$

$$= \frac{1}{2} \times AB \times CD$$

$$\Rightarrow 27 = \frac{1}{2} \times \frac{15}{2} \times CD$$

$$\Rightarrow CD = \frac{108}{15} = 7.2 \text{ cm}$$



150. (c) Let numbers be x and y , then according to the question,
 $x^2 - y^2 = 60$

$$\Rightarrow (x - y)(x + y) = 60 \quad \dots (i)$$

Possible factors of 60 in product of two numbers are

$$5 \times 12 = 60$$

$$2 \times 30 = 60$$

$$4 \times 15 = 60$$

$$1 \times 60 = 60$$

$$3 \times 20 = 60$$

$$6 \times 10 = 60$$

Here, only pairs '2 and 30' and '6 and 10' satisfying the Eq. (i).

Hence, two pairs exist.

151. (b) Second number can be $2^3, 3^3, 4^3 = 8, 27, 64$

Hence, three possible values exist.

152. (c) Suppose the number is $x + 10y + 100z = 0$

Now, reversing the number, new number

$$= z + 10y + 100x$$

According to the question,

$$x + 10y + 100z - z - 10y - 100x = 297$$

$$\Rightarrow z = x + 3$$

$$\text{Also, } x + y + z = 8$$

So, possible numbers are 512, 431.

In both numbers, we see the maximum hundred-digit number is 5. So, we consider the number 512.

So, tens digit is 1.

153. (d) We know that $(x - 2) \times 180^\circ = \text{Sum of angles of polygon}$
 with sides x .

i.e., sum of angles should be a multiple of 180° .

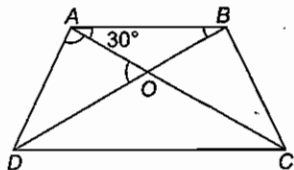
$$\therefore 2220^\circ = 180^\circ \times 12 + 60^\circ$$

$$\text{Now, } 2220^\circ + 120^\circ = 2340^\circ$$

$$\therefore (x - 2) = \frac{2340^\circ}{180^\circ}$$

$$\Rightarrow x - 2 = 13 \Rightarrow x = 15$$

154. (c) Since, $OA = OB \Rightarrow \angle OAB = \angle OBA = 30^\circ$



In $\triangle AOB$, $\angle AOB = 180^\circ - 30^\circ - 30^\circ = 120^\circ$

ODB is a straight line.

$$\therefore \angle AOD = 180^\circ - 120^\circ = 60^\circ$$

But $OA = OD$

$$\Rightarrow \angle AOD = \angle DAO = \angle ADO = 60^\circ$$

155. (a) Pens sold at no loss or no profit = $\frac{300}{4} = 75$

Shopkeeper sold three pens at 20% profit, whose cost price is ₹ 225.

Let CP of one pen = ₹ 1

CP of 225 pens = ₹ 225

SP of 225 pens

$$= \left(\frac{100 + 20}{100} \right) \times 225 = \frac{120}{100} \times 225$$

$$= ₹ 270$$

But total CP = ₹ 300

$$\therefore \text{Total SP} = 270 + 75 = ₹ 345$$

$$\therefore \text{Profit percent} = \frac{45}{300} \times 100 = 15\%$$

156. (b) $\sqrt{34 - 24\sqrt{2}} \times (4 + 3\sqrt{2})$

$$= \sqrt{34 - 24\sqrt{2}} \sqrt{(4 + 3\sqrt{2})^2}$$

$$= \sqrt{(34 - 24\sqrt{2})(16 + 18 + 24\sqrt{2})}$$

$$= \sqrt{(34 - 24\sqrt{2})(34 + 24\sqrt{2})}$$

$$= \sqrt{(34)^2 - (24\sqrt{2})^2}$$

$$= \sqrt{1156 - 1152} = \sqrt{4} = 2$$

157. (b) Given number is $aabb$, which can be rewritten as
 $1000a + 100a + 10b + b$

$$= 1100a + 11b$$

$$\Rightarrow = 11(100a + b)$$

For 'aabb' to be a perfect square,

$100a + b$ should be of the type $11 \times k^2$, where k is natural number.

\therefore The possible values of $11 \times k^2$ can be

$aabb$ are

$$121 \times 16$$

$$121 \times 25$$

$$121 \times 36$$

$$121 \times 49 \text{ neglected}$$

$$121 \times 64$$

So, 7744 is the given four-digit number and $7 + 4 = 11$

158. (c) \therefore Mean

$$= \frac{1 + 2^2 + 3^2 + 4^2 + \dots + 9^2}{(1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9)}$$

$$= \frac{9(9 + 1)(18 + 1)}{9 \times (9 + 1)}$$

$$= \frac{6}{9 \times \frac{(9 + 1)}{2}}$$

$$= \frac{3 \times 5 \times 19}{9 \times 5} = \frac{19}{3}$$

and mode = 9

$$\therefore \text{Required product} = \frac{19}{3} \times 9 = 57$$

159. (d) Let C_1, C_2 and C_3 be the circumference of the circle and $BC = x$.

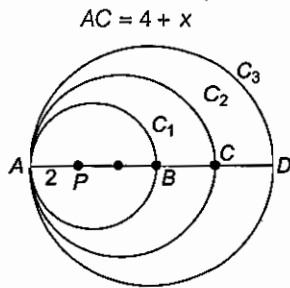
According to the given condition,

$$C_2 = \frac{C_1 + C_3}{2} \quad \dots (i)$$

Here,

$$C_1 = 2\pi \times 2 = 4\pi$$

Now,



$$\therefore C_2 = 2\pi \frac{(4+x)}{2} = \pi(4+x)$$

and
$$C_3 = 2\pi \frac{(6+x)}{2} = (6+x)\pi$$

From Eq. (i),
$$\pi(4+x) = \frac{4\pi + (6+x)\pi}{2}$$

$$\Rightarrow 10 + x = 8 + 2x$$

$$\Rightarrow x = 2$$

\therefore Radius of largest circle

$$= \frac{4 + 2 + 2}{2}$$

$$= 4$$

\therefore Area of largest circle

$$= 4^2\pi = 16\pi$$

160. (a) Let three consecutive odd numbers be x , $x + 2$ and $x + 4$

$$\therefore 200 < x + (x + 2) + (x + 4) < 400$$

$$\Rightarrow 200 < (3x + 6) < 400$$

$$200 < 3(x + 2) < 400$$

Squares lying between 200 and 400 are 225, 256, 289, 324, 361. In those of them 225 is the multiple of 3.

Hence, required sum = $\sqrt{225} = 15$

161. (c) These were the changes made by the British.

162. (b) Rest all are wrong statements.

163. (a) The agencies were formed by the respective people.

164. (a) The trading monopolies of the English East India were abolished.

165. (c) Mughal emperor continued to hold important position for the people of India.

166. (d) That is the order in which the agencies were founded.

167. (b) Since, many soldiers were recruited in the Indian army, their uniforms and other material for these soldiers was to be sent to India hence, the cotton import to India hence, the cotton import declined from Britain.

168. (c) William Jones and Colebrook were influenced by the ancient culture of India.

169. (a) The first Anglo Burmese war ended with treaty of Yandaboo according to which British merchants were allowed to treaty on Southern coast of Burme.

170. (d) Europeans were the first ones to use oil colours in paintings.

171. (b) In 1956, the second five year plant was formulated.

172. (b) Residuary list comes under the central list.

173. (b)

174. (d) Mixed economy was adopted after the independence.

175. (a) The soul of the NAM was not to be aligned with any of the super powers.

176. (c)

177. (a) Excess rain caused mud flow.

178. (c) Footloose industries are those which don't require any infrastructure.

179. (a)

180. (b) Wheat and maize require similar conditions.

181. (c)

182. (d) These are the basic requirements for IT industries.

183. (d) These industrial regions are situated out of the peninsular India.

184. (c) **185. (b)**

186. (c) Tropical rainforests have high temperature.

187. (b) The explanation is supported by the statements.

188. (d) All the statements show adoptive characters of animals related to their environment.

189. (b)

190. (a) Mulching is a process where straw is used to keep the land moist.

191. (c) The other options are invalid.

192. (b) The other options are invalid.

193. (a) This is the order in which these words appear in the Preamble.

194. (d)

195. (a) Liberal system allows the freedom to express.

196. (c) **197. (b)**

198. (d) The separation of powers helps in keeping check over the centre.

199. (c) Chairman of the Rajya Sabha is the Vice President of India.

200. (d) Indian democracy gives complete freedom of expression and other Fundamental Rights.