PART-I
MENTAL ABILITY TEST (Q. Nos. 1 to 50)
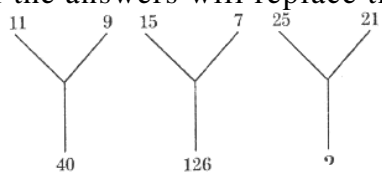## Max. Marks - 50

Note: SHADE the correct alternatives in the OMR Answer Sheet provided, from amongst the ones given against the corresponding question in the Question Booklet. For shading the circles, use HB Pencil.

Directions: Questions (1 to 5) :

In the number series given below, one number is missing. Each series is followed by five alternative answers (1), (2), (3), (4) and (5). One of them is the right answer. Identify and indicate it as per the "Instructions".
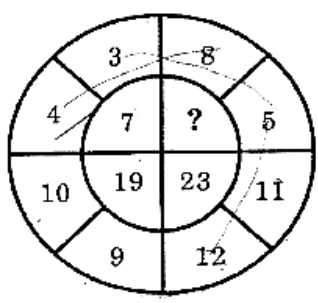
1.   0, 10, 34, 78, ...
   (1) 135   (2) 148   3) 156   4)102   5)124

2.   7, 31, 211,............
   1) 2311   2) 2211   (3) 2561   (4) 2781   (5) 2111

3.   24, 60, 96, 132, ...
   1) 126   2) 152   3) 144   4)168   5) 135

4.   7,6, 10, 27, 104, ...
   (1) 520   2) 420   (3) 515   4) 525   5) 456

5.   i, 5, 15, 34, 65, ...
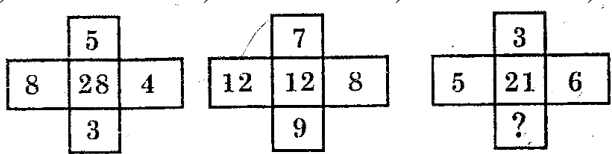   (1)111   2) 125   3) 117   4)126   5)105

Directions Questions (6 to 10) : In each of the questions, the numbers are arranged in a certain order. In one place, a question mark is given. Find out which one of the answers will replace the question mark

6.

   1) 184   2) 210   3)241   4)425   5)506

7.

9	17	16
5	4	?
5	4	8
9	17	8

   1)   2) 8   3) 4   4) 5   5) 10

   1) 35   2) 39   3) 34   4) 45   5) 11

9.

   1) 5   2) – 2   3) – 1   4) 3   5) 1

10.

| 4A	6C	24B
5A	?	45C
9B	4C	36A

   (1) 5C   (2) 9B   3) 7A   4) 7C   5) 8C

Directions: Questions (11 to 15) : Read the following information carefully and answer the questions below.

11. In a certain code LAWN is written as JCUP. How will SLIT be coded in that code?
    1)QNGV   (2) QJGV   (3) QNVG   (4) NJGV   (5) QGVN

12. In a certain code LOUD is written as JOSF, then which one of the following English words shall be coded PKQG?
    1) RISE   2) ROPE   3) ROAD   4) RICE   5) RAIN

13. In a certain code LONG is written as 5123 and GEAR is written as 3748. How is LANE written in that code?
    1) 5427   2) 5247   3) 5847   4) 5237   5) 5347

14. If KEDGY is coded as EKDYG, then how will LIGHT be coded?
    (1) ILHTG   (2) ILQHT   (3) ILGTH   (4) THGIL   5)IGLTH

15. If STRAY is coded as TUSBZ, then how will MOURN be coded?
    (1) LPVSO   (2) NPVSO   (3) NVPSO   (4) NPSVO   (5) NSPOV

Direction :Questions (16 to 20) : Read the following information carefully and answer the questions given below.

16. Count the number of cubes in the given figure.
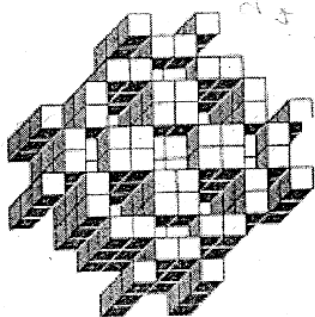
    1) 167   2)168   3)169   4) 170   5) 171

17. The four different positions of a dice are given in the figure. Find the number on the face opposite the face showing 6?
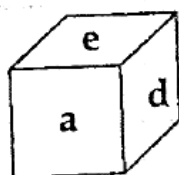

    (i)   (ii)   (iii)   (iv)
    1) 1   2) 2   3) 4   4)5   5) 3

18. In a dice a, *5, c* and *d* are written on the adjacent faces, in a clockwise order *e* and *f* at the top and bottom. When *c* is at the top, what will be at the bottom?

    1) a   2) *b*   3)c   4)*d*   5)e

19. A cube has six different symbols drawn over it six faces. The symbols are dot, circle, triangle, square, cross and arrow. Three different positions of the cube are shown in figures *X,* Y and *Z*. Which symbol occurs at the bottom of figure Y?

(X)   (Y)   (Z)
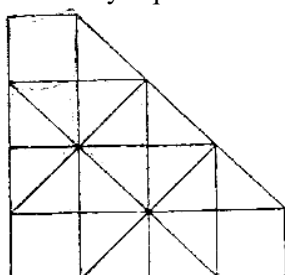
   1) Arrow   2) Triangle   3) Circle   (4) Dot   (5) Square

20.   How many squares are there in the given figure?

    1) 15   2) 18   3) 12   4) 16   5) 20

Directions: Questions (21 to 25) : In each of the following questions a letter series is given, in which some letters are missing. The missing letters are given in the proper sequence as one of the alternative. Find the correct alternative.

21.   a ____ aba ____ba____ab
    1) abbba   2) abbab   3) babb   4) bbaba   5) aaabb

22.   ab____b____bbaa
    1) abaab   2) abbab   3) baaab   4) babba   5) ababa

23.   ____baa____aab____ a____a
    1) aabb   4) baab   5) aaab

24.   ____babbba____a____
    1) ababb   2) baaab   3) bbaba   4) babbb   5) abbbb

25.   ____op____mo____n____pnmop____
    1) mnpmon   2) mpnmop   3) mnompn   4) mnpomn   5) mnmnpo

Directions: Questions (26 to 30) : Choose odd number questions. Certain numbers are given, out of which all except one are alike in some manner while one is different and this number is to be chosen as the answer

26.   2468, 2648, 4826, 6482
    (1) 2468   (2) 2648   3) 4 8 2 6   4) 6 4 8 2   5) 2 8 6 4

27.   2, 16, 56, 128
    1) 2   2) 16   3) 56   4) 128   5) 32

28.   9611, 7324, 2690, 1754
    1) 9611   2) 7 3 2 4   3) 2 6 9 0   4) 1 7 5 4   5) 1 5 4 7

29.   7, 5, 31, 57
    (1) 7   (2) 5   (3) 31   (4) 57   (5) 65

30.   232, 431, 612, 813
    1) 232   2) 431   3) 612   4) 813   5) 831

**Directions: Questions (31 to 35)** These questions are based on the diagram given below.
A) Rectangle represents males.
B) Triangle represents educated.
C) Circle represents urban resident
D) Square represents civil servant
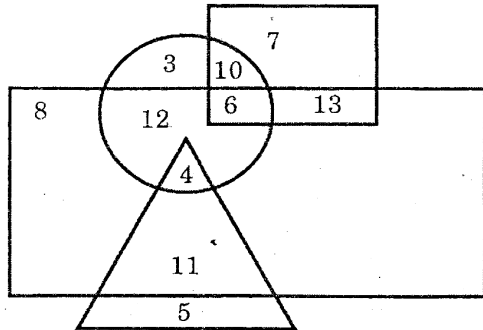
31. Who among the following is an educated male who is not an urban resident?
    1) 4   2) 5   3) 8   (4) 11   (5) 6

32. Who among the following is neither a civil servant nor educated but is urban and not a male?
    (1) 2   2) 3   (3) 6   4) 10   5) 7

33. Who among the following is a female, urban resident and also a civil servant?
    1) 6   2) 7   3) 10   (4) 13   (5) 8

34. Who among the following is an educated male who hails from urban area?
    1) 1   2) 2   3) 11   4) 5   5) 7

35. Who among the following is uneducated and also an urban male?
    1) 2   2) 3   3) 11   4) 12   5) 7

Directions: Questions (36 to 40) : Answer the following as per the "Instructions".
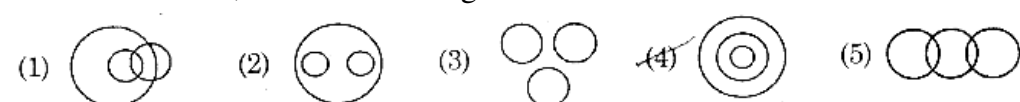
36. Which one of the following diagrams indicates the best relation between travellers, train and bus.
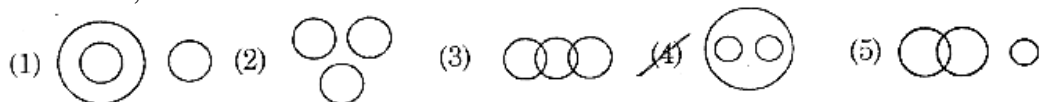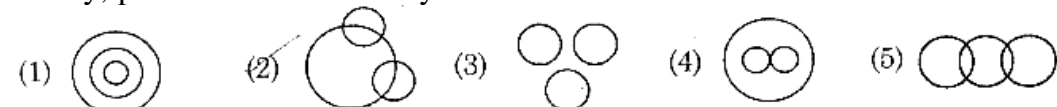

    between profit, dividend and bonus?

38. Which one of the following diagrams indicates the best relationship between women, mother and engineers?

39. Which one of the following diagrams indicates the best relationship between factory, product and machinery?


6

40. Which one of the following diagrams indicates the best relationship between author, lawyer and singer?
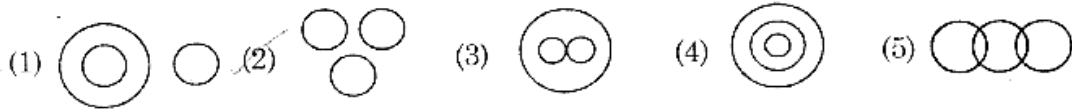
Directions: Questions (41 to 45) : Each of the following questions consists of two sets of figures. Figures A, B, C and D constitute the problem set, while figures 1, 2, 3, 4, and 5 constitutes the answer set. Select a suitable figure from the answer figure that would replace the question mark (?).
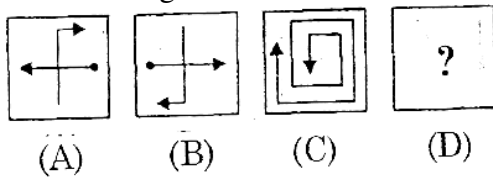
41. Problem Figures   Answer Figures
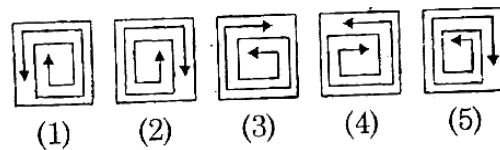
42. Problem Figures   Answer Figures

43. Problem Figures   Answer Figures
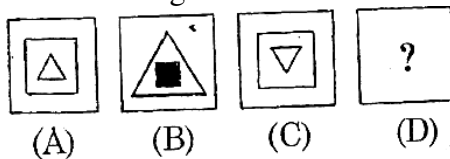
44. Problem Figures   Answer Figures

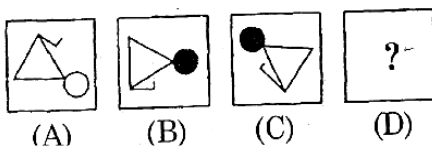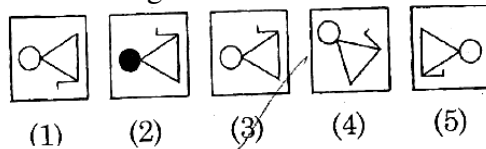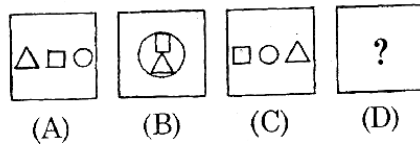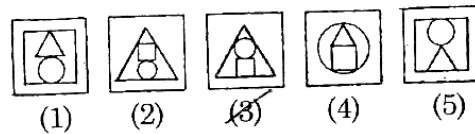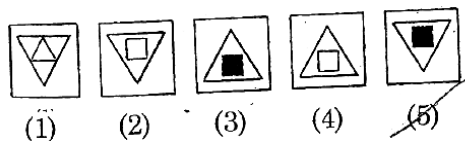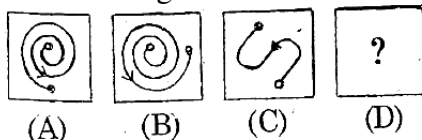45. Problem Figures   Answer Figures
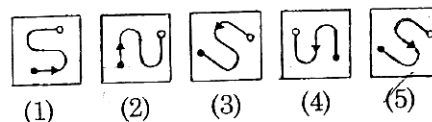
Direction :Questions (46 to 50) : Each of the following questions consists of the five figures marked A, B, C, D and E called the problem figures followed by five alternatives marked 1, 2, 3, 4, and 5 called the answer figures. Select a figure which will continue the same series established by the five problem figures.

46.   Problem Figures   Answer Figures

        (A)   (B)   (C)   (D)   (E)   (1)   (2)   (3)   (4)   (5)
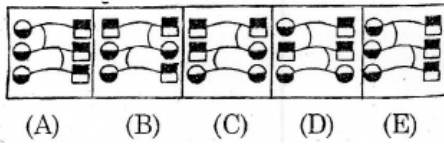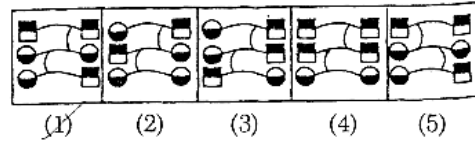
47.   Problem Figures   Answer Figures

        (A)   (B)   (C)   (D)   (E)   (1)   (2)   (3)   (4)   (5)
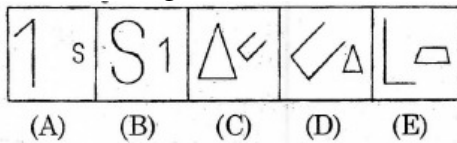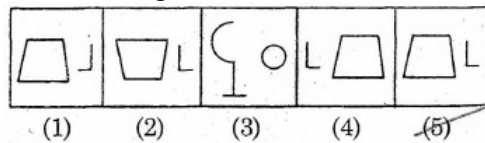
48.   Problem Figures   Answer Figures

        (A)   (B)   (C)   (D)   (E)   (1)   (2)   (3)   (4)   (5)
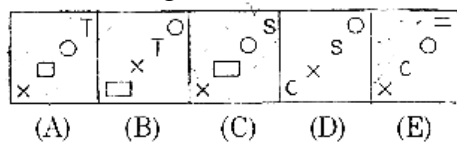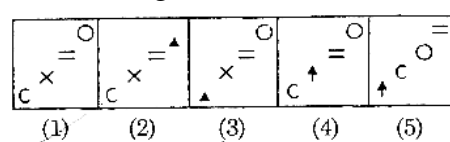
49.   Problem Figures   Answer Figures

        (A)   (B)   (C)   (D)   (E)   (1)   (2)   (3)   (4)   (5)
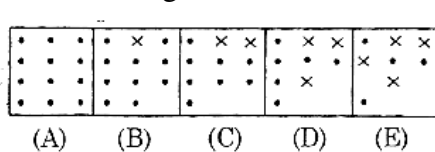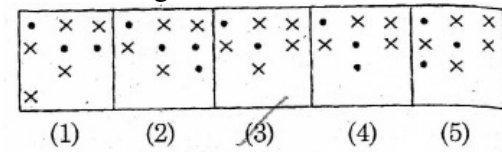
50.   Problem Figures   Answer Figures

        (A)   (B)   (C)   (D)   (E)   (1)   (2)   (3)   (4)   (5)
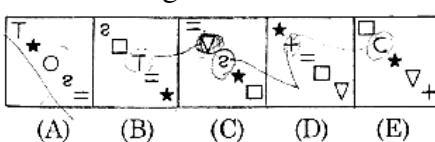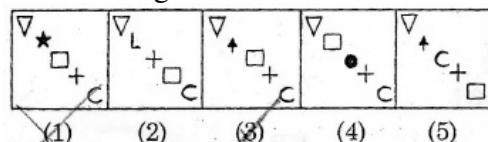
PART-II
LANGUAGE COMPREHENSIVE TEST
(Q. Nos. 51 to 100)
Max. Marks - 50

Note:

i) SHADE the correct alternatives in the OMR Answerr Sheet provided, from amongst the ones given against the corresponding question in the Question Booklet. For shading the circles, use HB Pencil.

ii) Q. No. 51 to 100 of Language Comprehensive Test contains English Language along with a blank sheet for rough work.

Directions:
Questions (51 to 55) :
Read the following passage and answer the questions given after it.

When you are being interviewed for a job, remember that its normal for many people to be nervous, particularly in such a stress producing situation. There are plenty of jobs-indeed, probably most where a little nervousness isn't looked at askance. It does help to dry a damp brow or a clammy hand just before meeting the interviewer, but otherwise, don't be too concerned about the outward manifestations of your nervousness. Experienced interviewers will discount most physical signs of nervousness. The only one that people have a hard time ignoring is a fidgety hand. Interviewees who constantly twist their hands or make movements that are dramatically distracting are calling to their nervousness. Remember that interviewers talk to people in order to hire, not because they enjoy embarrassing, uneasy applicants. One way to overcome a flustered feeling, or "butterflies in the stomach", is to note that interviewers want to hire people who have something to offer the company. If interviewers think you will fit into their organization, you will be the one who is sought after. It's almost as if you are interviewing them to see if they are good enough for you.

51. According to the passage, the outward sign of nervousness that attracts the attention of interviewers is
    (1) a damp brow   (2) clammy hands
    (3) restless hand gestures   (4) jittery stomach
52. An interviewer is someone who
    (1) is looking for a job
    (2) seeks facts from prospective employees
    (3) has already hired you
    (4) is always qn the lookout to trip applicants
53. It can be inferred from the passage that overcoming nervousness is a matter of
    (1) wiping your head and hands before entering the interview room
    (2) taking several tranquilizers before the interview
    (3) being dramatic and aggressive
    (4) realizing that interviews are two sided and making the most of it.
54. "Butterflies in the stomach" means
    (1) a nervous feeling   (2) feeling of happiness
    (3) woes   (4) sufferings
55. "discount" in the passage means
    (1) remember   (2) ignore   (3) discontinue   (4) discharge

Directions: Questions (56 to 60) :
Read the following passage and answers the questions given after it.

I hated almost everyday of my time at a boarding school and in any case, my first term was a disaster. I found it very difficult to settle down and my unhappiness was made worse because I was also unhappy at home. A happy home life gives you a base from which you can go into the world with confidence. But if life at home is difficult, life away at boarding school is almost impossible. Apart from having to keep to great many rules, we were never allowed to be alone. You had to be with another boy at all time. Though the other boys managed pretty well, daily life at school was very hard for me as I was extremely dependent on being alone part of everyday. In the middle of the first term, I developed a cough. The school nurse said it was a "stomach cough", whatever that may be and gave me some pills. However, afterwards, playing football in a snowstorm, I suddenly could not breathe properly and was taken to hospital, ill with bronchitis and pneumonia.
Almost at once I was put into a small room with another boy who was also very ill. He died and I nearly did. My main memory of my stay at the hospital was that the night-nurses

used to get together in my room and play cards and chat. Keeping The light on and keeping me awake when I was seriously ill didn't bother them. When I had recovered
I was sent home for a few weeks and missed a term.

When I returned to school, I was sent to bed early because of my illness, and so managed to get a brief period alone every day. Later on, when I went into the senior part of the school, I was allowed to go to the school library by myself, which was a great improvement. The day I left the school, the headmaster said good bye and asked whether it was a sad day for me. I replied that it was the happiest day of my life. He said I would come to think of my time at the school very differently. I said that I was sure that, would not. Though, I have had unhappy day since that day, I have found that my conclusions then that nothing afterwards could ever be so bad as boarding school - have been proved true.

56. The author's illness during the first term was
   (1) so serious he nearly died
   (2) caused by getting cold when playing games
   (3) not so bad as he had feared
   (4) not treated by the school nurse

57. In the hospital he
   (1) felt very sorry for the other patients
   (2) was afraid to bother nurses
   (3) didn't notice whether it was night or day
   (4) found the nurses' behaviour disturbed him

58. The result of Isis illness was that he
   (1) was away from school for a year   2) was taught in the school library
   (3) had some private time for himself   (4) had to do his home work in bed

59. When the author was leaving school, the headmaster believed the author would
   (1) realize how good school life had been   (2) be unhappy after he left school
   (3) be thankful to be leaving school   (4) regret his last day at school

60. The author concluded that
   (1) the school nurse disturbed him at school
   (2) the headmaster was happy to leave the boarding school
   (3) nothing could be more sad than staying at boarding school
   (4) because of boarding school, he survived from pneumonia

Directions: Questions (61 to 65): Hatred is a fundamental human emotion that has deep roots in society and culture. Psychologists believe that group identity and cohesion depend to a large extent on having a common enemy. It seems that the existence of "bad guys" is an important element in defining who we are within a large realm. It could be said that human beings love to hate. The first signs appear early in life when a child, faced with blame for some mistakes, immediately accuses another child or an inanimate object such as a teddy bear. Later on the school playground children in rival groups vie for attention and influence. These basic responses translate into more powerful emotions later in life. One area where deep rooted hatred is exhibited is in the ethnic clashes that constantly occur around the globe. These conflicts are not only over territory but also involve emotional issues of group identity and unity of purpose.
For many, there is no "us" without a "them" to hate. In a world where conflict between super powers is on decline, it may be that humanity will have difficulty adapting so a state of mutual respect and cooperation.

61. The best title for the passage!
(1) Roots of society   (2) Group unity
(3) Social and cultural problem   (4) A basic emotion

62. What is believed to be an important aspect to defining group identity?
    (1) Being reluctant to hate
    (2) Facing a common enemy
    (3) Ignoring a large realm
    (4) Accepting the blame for past actions

63. According to the passage, early childhood responses to blame
    (1) are not related to stronger feelings in adulthood
    (2) are not well understood by psychologists
    (3) are complex expressions of emotion
    (4) demonstrate how human beings love to hate

64. The author suggests that when children make mistakes, they
    (1) join rival gangs on school playgrounds
    (2) rarely accept responsibility for their actions
    (3) need emotional support from personal objects like a teddy bear
    (4) readily admit to their errors

65. According to the passage, ethnic conflicts
    (1) are on the decline
    (2) occur only occasionally
    (3) serve to resolve differences
    (4) have their roots in childhood rivalries

Directions: Questions (66 - 71) : In the following passage, there are some numbered blanks. Fill in the blanks by selecting the most appropriate word for each blank from the given options.

Can we see _**66**_ the earth is a glob   can, when we watch a ship that sails out to sea. If we watch closely, we see that the ship begins _**67**_. The bottom of the ship disappears first and then the ship seems to sink lower and lower, _**68**_ we can only see the top of the ship, and then we see nothing at all. What is hiding the ship from us? It is the earth. Stick a pin most of the way into an orange, and _69 turn the _**70**_ away from you. You will see the pin disappear _**71**_ a ship does on the earth.

66. (1) if   (2) where   (3) that   (4) whether
67. (1) being disappeared   (2) to be disappeared
    (3) to disappear   (4) to have disappeared
68. (1) until   (2) since   (3) after   (4) unless
69. (1) reluctantly   (2) slowly   (3) accidentally   (4) passionately
70. (1) orange   (2) S h i p   (3) pin   (4) e a r t h
71. (1) the same   (2) alike   (3) just as   (4) by the way

Direction : Questions (72 and 73) : The following sentences come from a paragraph. The first and the last sentences/parts are given. Choose the order in which the three sentences/parts (PQR) should appear to complete the paragraph.

72. S_1 **All** nations which have risen to greatness

S_2 ....

S_3 ....

S_4 ....

S_5 In the course of three decades Germany was twice all but destroyed.

P. So do the Germans

Q. Have been characterized by a sense of mission

R. The Japanese have it in large measure.

Choose from the options given below.

(1) PRQ   (2) QRP   (3)RPQ   (4)RQP

73. S_1 The first step towards knowledge is awareness of areas of ignorance.

S_2 ....

S_3 ....

S_4 ....

S_5 A person who thinks he knows everything has the most to learn.

P. The more he realizes

Q. What areas he is ignorant in

R. The more knowledge a person gets

Choose from the options given below.

(1) QRP   (2) RQP   (3) QPR   (4) PRQ

Direction : Questions (74 to 77) : For each of the following groups of four words, find the incorrectly spelt word.

74.   (1) embarassed   (2) questionnaire

(3)immediately   (4) mischeivous

75.   (1) guaranty (2) colleague   (3) changeable equipment   (4) possession

76.   (1) dicsipline   (2) possession (3) cemetery   (4) committee

77.   (1) competent   (2) maintenance   (3) fulfillment   (4)homogenous

Direction :Questions (78 to 85) : Select the most appropriate option to fill in the blanks from the given alternatives.

78.   Ha   r been located? It was found ....on the highway.

(1)to be abandoned   (2) to be abandoning

(3) abandoned   (4) abandon

79.   He passed himself off as a noble man.

(1) was thought to be   (2) pretended to be

(3) was regarded as   (4) was looked upon

80.   They went to Manali........... train.

(1) into   (2) by   (3) from   (4) on

81.   Wesome flowers and put them in a vase.

(1)picked upon   (2)picked on   (3) picked   (4)picked up

82.   My work is precise. I work with.....

(1) perfection   (2) precision   (3) precaution   (4)perception

83.   Perhaps she ought to go away, and ……..a new start somewhere else.
        (1) originate   (2)begin   (3)make   (4) do
84.   She ………..phoned ……..wrote after she left home.
        (1)either, or   (2)while, and   (3)though, or   (4)neither, nor
85.   The window was already ……..when I got here.
        (1) breaking   (2)broken   (3) broke   (4) break

Direction : Questions (86 to 90) : Choose the one, which best expresses the meaning of the given phrase.

86.   Break into
        (1) stop   (2) enter by force   (3)to raise   (4)to repair
87.   Come off
        1) fail   (2) walk fast   (3)succeed   (4)to lend
88.   Give in
        (1)discuss   (2)surrender   (3) to struggle   (4)to require
89.   Put off
        (1)to suppress   (2) wear   (3) extinguish   (4)postpone
90.   Set aside
        (1) by the side of   (2)to form   (3)cancel   (4)

Direction : Questions (91 to 95) : Select the word which means the same as the given words.

91.   Complacent
        (1) Complete   (2)self satisfied   (3)brightly coloured   (4)alliance
92.   Scorn
        (1)admiration   (2)Contempt   (3)Applaud   (4)Praise
93.   Audacious
        (1)timid   (2)cowardly   (3)related to sound   (4)bold
94.   Seeping
        (1)seeing through   (2)smiling   (3)flowing slowly   (4)whine
95.   dexterous
        (1)Skilful   2)confused   (3)profound   (4)resign

Direction : Questions (96 to 100) : Select the word which means the opposite of the given words.

96.   Faithful
        (1) loyal   (2) treacherous   (3) sincere   (4)honest
97. enrich
        (1) equip   (2) empower   (3) impoverish   (4) prosper
98.   Convict
        (1) acquit   (2) deficit   (3) inflict   (4) reflect
99.   Assemble
        (1) sacrifice   (2)resemble   (3) overcome   (4) disperse
100.   Abundance
        (1)dearth   (2) plentiful   (3)surplus   (4)obstruction

PART- III

APTITUDE TEST (Q. Nos. 101 to 200)

Max. Marks - 100

Note:

i.   Subjects, Questions S1.No. and Marks allotted:

1.	Physics	101 to 113 Questions	13 Marks
2.	Chemistry	114 to 126 Questions	13 Marks
3.	Biology	127 to 140 Questions	14 Marks
4.	Mathematics	141 to 160 Questions	20 Marks
5.	History	161 to 172 Questions	12 Marks
6.	Geography	173 to 184 Questions	12 Marks
7.	Political Science	185 to 192 Questions	08 Marks
8.	Economics	93 to 200 Questions	08 Marks

ii.   **SHADE** the circle having the correct alternative in the OMR Sheet provided, from among the ones given against the corresponding question in the Question Paper Booklet. For shading the circles, use **HB Pencil.**

PHYSICS

101. A man in a boat A pulls a rope with a force 100N. The other end of the rope is tied to a boat B of mass 200 kg. the total mass of boat A and man is 300kg, disregard the weight of the rope and the resistance of the water. The power developed by the man by the end of the third second is
   a) 100W   b) 200 W   c) 150W   d) 250 W

102. A launch takes 3 hours to go downstream from point A to B and 6 hours to come back to A from B. The time taken by the launch to cover the same distance downstream when its engine cutoff is ……
   a) 12 hrs   b) 9 hrs   c) 4.5 hrs   d) 18 hrs

103. An ammeter and a voltmeter are joined in series to a cell. Their readings are A and V respectively. If a resistance is now joined in parallel with the voltmenter, …..
   a) A will increase, V will decrease   b) both A and V will increase
   c) both A and V will decrease   d) A will decrease, V will incease

104. System is shown in the figure. Light rays from a point object are first deviated by a prism and then focused by a thin lens of focal length f. The prism is made of material with refractive index 3/2 and has small apex angle 2° ie, small angle approximations are valid $Sin\alpha \cong \alpha$ and $Sin(\alpha+\beta) = \alpha+\beta$, whered α and β are angles. The final image is …..
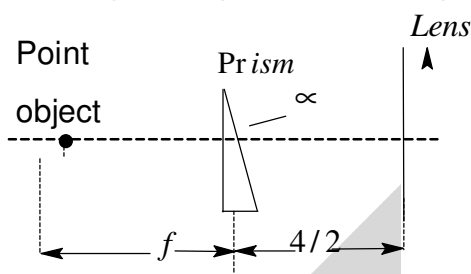
   a) virtual and formed at a distance 2f from the lens
   b) real and formed at a distance 2f from the lens
   c) real and formed at a distance 3f/2
   d) real and formed at a distance 3f from the lens

105. A narrow beam of light is incident on a $30^o - 60^o - 90^o$ prism perpendicular to the surface AB. Assume that light beam is close to A. The index of refraction of prism is 2.1. See figure and

   take $^{-1}\left(\dfrac{10}{}\right) = 28^o26'$. The beam emerges from the face…….

   a)CB
   b)AB
   c)AC
   d) Some light through AC and remaining light through AB
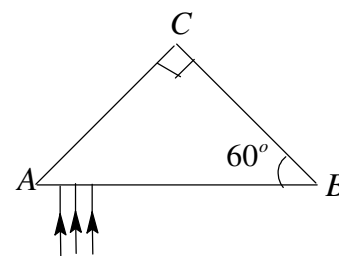
106. A spherical iron ball is placed on a large block of dry ice at $0^o C$. The ball sinks into the ice until it is half submerged. Density of iron is $7.7 \times 10^3 kg/m^3$. Density of ice is 920 kg/m^3. Specific heat capacity of iron is 504 J/kg – K and latent heat of fusion of ice is $336 \times 10^3 J/kg$. The initial temperature of iron is ……
   a) $37.64^o C$ b) $39.82^o C$ c) $42.62^o C$ d) $38.64^o C$

107. A galvanometer is used to measure small currents. A certain galvanometer has a resistance 500Ω and gives a full-scale deflection for a current of $200\mu A$. This meter is connected as shown in the figure ot make a multirange current meter.
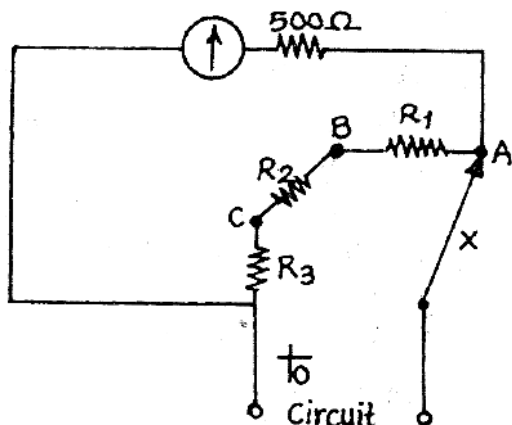
Connection to the circuit is made at the terminals shown. The currents in the external circuit needed to give full sacle deflections when X is connected to A,B and C in turn are shown the table

X connected to	Current in the external circuit (mA)
A	I
B	10
C	100

The value of R_3 is …..

a) $2.25\,\Omega$　　　　　b)$0.25\,\Omega$　　　　　c) $1.25\,\Omega$　　　　d)$3.25\,\Omega$

108. Light rays from a very small object immersed in water falls on the bubble of radius R. Assume that the object is very close to the surface of the bubble. Refractive index of water is 4/3. Take the approximation $Sin\theta \cong \theta$ and $Cos\theta \cong 1$ where 'θ' is angle and consider the rays close rto

a diameter of the bubble. Use the following formula to solve the problem $\dfrac{\sin\alpha}{a} = \dfrac{\sin\beta}{b} = \dfrac{\sin\gamma}{c}$

(see figure)
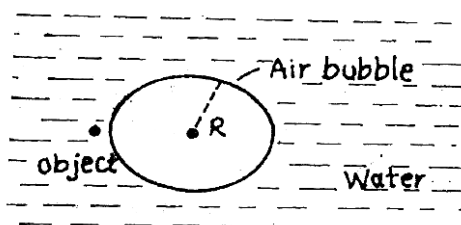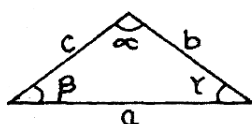
a) Virtual and formed at a distance 3R/2
b) Virtual and formed at a distance 2R/3
c) Virtual and formed at a distance 3R/5
d) Real and formed at a distance 3R/2

109. At what height above the earth's surface is the acceleration due to gravity 1% less than its value at the surface Radius of earth is 6400 km.　Take $(1+x)^{-2} = 1-2x$ when x << 1

a)16 km　　　　　b) 32 km　　　　　c) 64 km　　　　d) $32\sqrt{2}km$

110. An ant runs from an ant-hill in a straight line so that its velocity is inversely proportional to the distance from the center of ant-hill. When the ant is at a point A at a distance 1m from the center of the hill, its velocity is 2 cm/s. Point B is at a distance of 2 m from the center of the ant-hill. The time taken by the ant to run from A to B is …….
    a) 25 s   b) 75s   c) 55s   d) 65s

111. The two ends of a horizontal conducting rod of length l are joined to a voltmeter. The whole arrangement moves with a horizontal velocity u, the direction of motion being perpendicular to the rod. The vertical component of earth's magnetic field is B. The voltmenter reading is …..

    a) Blv only if the rod moves eastward   b) Blv only if the rod moves westward
    c) Blv only if the rod moves in any direction   d) zero

112. A ball of uniform density 2/3 of that of water is dropped freely into a pond from a height 10m above its surface. The maximum depth the ball can travel in water is …..
    a) 21m   b) 10m   c)20m   d)30m

113. System is shown in figure. System is in equilibrium state. Assume that springs, threads and pulley are weightless. If the lower thread 'A' has been cut, immediately masses m_1, m_2, m_3 and m_4 get accelerations $\alpha_1, \alpha_2, \alpha_3$ and α_4 respectively. Which of the following is TRUE?
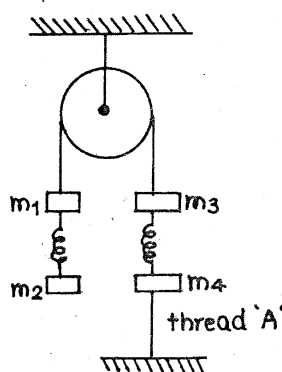
    a) $\alpha_1 \neq 0; \alpha_2 \neq 0; \alpha_3 \neq 0; \alpha_4 \neq 0$ b) $\alpha_1 = \alpha_2 = \alpha_3 = 0; \alpha_4 = 0$
    c) $\alpha_1 = \alpha_2 = 0; \alpha_3 \neq 0; \alpha_4$ d) $\alpha_2 \neq 0; \alpha_1 \neq 0; \alpha_3 = 0; \alpha_4 \neq 0$

CHEMISTRY

114. Chemical tests of four metals A,B,C,D shown the following results :]
    * Only B and C react with 0.5 M HCl to give H_2 gas
    * When B is added to a solution containing the ions of the other metals
    * A reacts with 6 M HNO_3, but D does not

    Arrange the metals in the increasing order as reducing agents
    a)B,C,A,D   b) C,A,D,B   c) A,D,B,C   d) D,A,C,B

115. Classify each of the following reactions :
    a) $Zn_{(s)} + 2AgNO_{3(aq)} \rightarrow Zn(NO_3)_{2(ag)} + 2Ag_{(s)}$

    b) $Ca(OH)_{2(s)} \xrightarrow{\text{Heating}} CaO_{(s)} + H_2O_{(g)}$

    c) $Cu(NO_3)_{2(aq)} + Na_2S_{(aq)} \rightarrow 2NaNO_{3(aq)}$

    d) $H_2SO_{3(aq)} + 2KOH_{(aq)} \rightarrow K_2SO_{3(aq)} + 2H_2O_{(l)}$

Reaction/Type of reaction

(a)	(b)	(c)	(d)
1) Precipitation	Neutralization	Decomposition	Redox, reaction
2) Neutralization	Precipitation	Redox reaction	Decomposition
3) Redox reaction	Decomposition	Precipitation	Neutralization
4) Decomposition	Redox reaction	Neutralization	Precipitation

116. Consider the following pairs of elements :
     I and H
     C and F
     B α and F
     N and F
     K and O
     The correct statement regarding these pairs is
     1) The two pairs B α and F, K and O most likely to form Ionic bonds
     2) The least polar bond is formed between C and F
     3) Between I and H an ionic bond is formed
     4) Between N and F the covalent bond is most polar

117. We have to get the problem of acid rain under control. We must do whatever it takes to get the pH down to zero". The quote is …..
     1) absolutely correct
     2) wrong
     3) meaningless because pH rain water has no relation with its acidic nature
     4) quite meaningful

118. Match the following

Compound formula	Class of the compound
a) C_2H_4	i) Alkane
b) C_7H_{12}	ii) Alkene
c) $C_{13}H_{28}$	iii) Alkyne
d) C_5H_{10}	iv) Possible cyclo alka

1) a-iii, b-ii, c-I, d-iv   2) a-ii, b-iii, c-I, d-iv   3) a-iv, b-iii,c-ii, d-i   4)a-iii,b-ii,c-iv, d-i

119. Which of the following class of organic compound does not contain (C=0) group in some form ?
     1) Aldehydes   2) Ehters   3) Carboxylic acids   4) Esters

120. Sodium azide NaN_3 decomposes explosively to sodium metal and nitrogen gas and is used in automobile air bags $2NaN_3 \rightarrow 2Na + 3N_2$ Azide ion is isoelectronic to …….
     1)CO   2)NO   3) CO_2 4) H_2O

121. The path of light gets illuminated when passed through the solution
     1)Blood solution $_{(aq)}$ 2) Brine solution $_{(aq)}$
     3) Cpper sulphate soluti $_{(aq)}$ 4) Acetic acid solution $_{(aq)}$

122. Which one of the following is the smallest in size ?
     1)   2) O^2 3) F^{-1} 4) Na

123. The action of cleaning of oily dirt by soap is based on ……..
     1) solubility in water
     2) hydrophilic property
     3) hydrophobic property
     4) presence of both hydrophilic and hydrophobic groups

124. Graphite is very soft as compared other substances because ………
     1) carbon atoms are arranged in such a way that they form flint layers
     2) carbon atoms are arranged in such a way that they form flint layers
     3) linkages between atoms within layer of graphite are weak
     4) linkages between atoms of the layers are weak

19

125. The gaseous hydrocarbon acetyle C_2H_2 used in welder's torch releases 1300kJ. When 1 mole C_2H_2 under goes combustion, the which of the following is not true

    1) Combustion of acetylene is exothermic reaction

    2) The balanced chemical reacting combustion of acetylene is $C_2H_2 + 5O_2 \rightarrow 2CO_2 + H_2O$

    3) 2 moles of water produced 2 moles of acetylene reacts

    4) 44 g of CO_2 produced when of acetylene reacts

126. You have the mythical metal element 'X' that can exhibit variable value 1,2 and 5. Which of the following are not the correct chemical for formulae for the compounds of by the combination of the "X" with different radicals ?

    A) XPO_4 B) X_2SO_4 C) X_5ClO_4 D) X_3NO_3

    1) Only B   2) B and C   3) A,C and D   4) B and D

BIOLOGY

127. Your friend is unable to identify the colours of flowers. What would be the reason ?

    A) Malfunctioning of rods   B) Malfunctioning of Cones
    C) Haemophilia   D) Colour blindness

    Choose the correct answers

    a) A,B   b) A,C   c) B,C   d) B,D

128. Biolouminescence is a feature exhibited by animals of ……….

    a) Abyssal zone   b) Euphotic zone   Bathyal zone   d) Photic zone

129. Match the items in Group-1 with Group-2

Group –I	Group – 2
A) Instinct	i) Doucklings
B) Imprinting	ii) Pavlov
C) Imitation	iii) Reflexes
D) Conditioning	iv) Monkey and hat merchant

    Choose the correct answer:

    a) A-iv, B-i, C-iii, D-ii   b) A-iii, B-i, C-iv, D-ii
    c) A-iii, B-iv, C-i, D-ii   d) A-ii, B-i, C-iv, D-iii

130. In muscular tissues contractile proteins play a role in …….

    a) Osmosis and diffusion   b) Contraction and relaxation
    c) Transpiration and transportation   d) Excretion and secretion

131. At the end of the experiment to prove that light is necessary for photosynthesis, when the leaf was tested with iodine, the 'S' shaped figure on the leaf was found to be

    a) green – presence of starch
    b) blue – black presence of starch
    c) green – absence of starch
    d) blue black absence of starch

132. One boy as not able to see in the night. Which kind of vitamins you suggest him to take ?

    a) Calciferol   b) Tocoferol   c) Retinol   d) Riboflavin

133. Which of the following statements are TRUE about respiration ?

    i) Hemoglobin has greater affinity for CO_2 than O_2

    ii) The gaseous exchange takes place in the alveoli

    iii) During inhalation ribs move inward and diaphragm is raised

    iv) Hemoglobin has greater affinity for O_2 than CO_2

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

134. 'Edema' is related to …….

    a) Digestive system   b) Excretory system   c) Lymphatic system   d) Arterial system
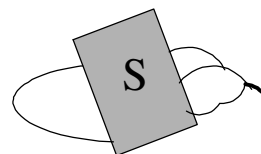
135. Some organs of man have their own specific functions but carry out excretion as a secondary function. Identify them
a) Lungs, Kidney, Nephron b) Liver, Skin, Lungs
c) Skin, Kidney, Intestine d) Intestine, Liver, Kidney

136. If you keep a ripened fruit in the midst of a basket of raw fruits, all the fruits get ripened in short period. Because of
a) Auxin produced by ripened fruits b) Abscisic acid produced by ripened fruits
c) Ethylene produced by ripened fruits d) Gibberellins produced by ripened fruits

137. How many ovules might have been fertilized to produce 100 seeds in a water melon ?
a) 25 b) 50 c) 100 d) 125

138. A rose plant obtained from self cross of heterozygous red has produced 200 flowers. How may of them would be heterozygous red flowers ?
a) 25 b) 50 c) 100 d) 150

139. What will happen if snake is miss in the food chain given below ?
   Grains $\rightarrow$ Rat $\rightarrow$ Snake $\rightarrow$ Eagle
a) Total quantity of grains of increase b) Population of eagles may increase
c) Eagle starts to eat grains d) Populaiton of rats may increase

140. Which of the following practice suitable to farmer with less resources ?
A) Select a short term crop B) Cultivate commercial crop
B) Adopt drip irrigation system D) Crop holiday
a) A and C b) A,B and C c) A and D d) C and D

MATHEMATICS

$(x+3y)^2 - z^2 = 36$, then the value of x = ……….
1) 3 2) $\dfrac{1}{3}$ 3) 3 4) 5

142. If the roots of quadratic equation $x^2 + px + q = 0$ are $Tan30^o$ and $Tan15^0$ respectively, then the value of 2+q-p=……….
1) 3 2) 4 3) -1 4) -2

143. If 30,72 and x are three integers, such that the product of any two of them is divisible by the third, then the least value of x is
1) 45 2) 60 3) 48 4) 24

144. In the right triangle shown MB+MA = BC+ AC. If BC = 8 and AC = 10, then the value
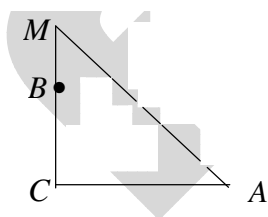
1) $\dfrac{27}{5}$ 2) $\dfrac{15}{7}$ 3) $\dfrac{40}{13}$ 4) 6

145. Let a,b and c be real numbers, such that a -7b + 8c = 4 and $8a + 4b - c = 7$ then the value of $a^2 - b^2 + c^2 = ...$
1) -1 2) 4 3) -2 4) 1

146. The roots of $x^3 + 3x^3 + 4x - 11 = 0$ a,b and c and that the roots of $x^3 + rx^2 + sx + l = 0$ are $a+b , b+c$ and $c+a$, then the value of t = …..
1) 18 2) 23 3) 15 4) -17

147. If a < b < c < d < e are consecutive positive integers, such that b + c + d is a perfect square and a + b+c +d+e is a perfect cube. What is the smallest possible value of c ?
    1) 675   2) 576   3) 475   4) 384

148. Product of two roots $x^4 + 11x^3 + kx^2 + 269x - 2001$ is -69, then the value of k = ….
    1) 5   2) -7   3) -10   4) 8

149. In triangle ABC, AC = 3AB, let AD bisect angle A with D lying on BC and let E be the foot of the perpendicular from C to AD. Then $\dfrac{area\ of\ \Delta ABD}{area\ of\ \Delta CDE} = ...$

    1) 2   2) $\dfrac{1}{3}$ 3) $\dfrac{1}{4}$ 4) $\dfrac{2}{3}$

150. 3 sides of triangle are consecutive integers and the largest angle is twice the smallest angle. The perimeter of triangle is ……
    1) 15 units   20 10 units   3) 12 units   4) 16 units

151. In a triangle ABC,D is the mid point of AB, E is the mid point of DB and F is the mid point of BC. If the area of ΔABC is 96, then the area of ΔAEF is ….
    1) 16   2) 24   3) 32   4) 36

152. In the quadrilateral ABCD, $A = C = 90^0$, AE = 5 cm, BE = 12 cm and AC=21 cm. If DF=x, then the value of x = ………
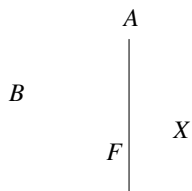
    1) $4\dfrac{3}{5}\ cm$ 2) 1 cm 4) 7 cm

153. In the figure 'O' is the in center of ΔABC where AB = 3 cm. BC = 4 cm and AC = 5 cm. Area of ΔABC = rs. Where r is in radius and s is the semiperimeter, then the value of OC =
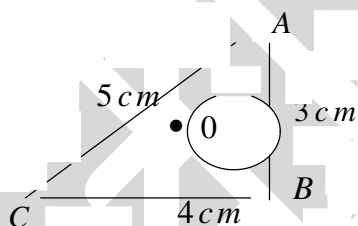
    1) $\sqrt{10}cm$ 2) 8 cm   3) $5\sqrt{}cm$ 4) $2\ 2\sqrt{}cm$

154. If $p(x) = x^4 + ax^3 + bx^2 + cx + d$ p(1) = p(2) = p(3) =0, then the value of p(4)+p(0) = ……..
    1) 10   2) 24   3) 25   4) 12

155. In the adjoining figure ABC is a triangle, P is an interior point in it. Three lines are drawn through the point P, parallel to three sides as shown in the figure. The triangle is divided into six parts. The areas as 3 smaller triangle are 4,9 and 16 units, then the area of ΔABC is …..
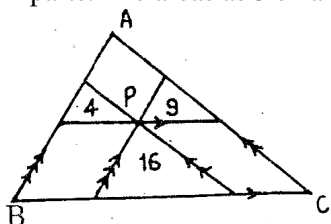
    1) 64   2) 81   3) 42   4) 65

156. In the figure O is the center of the circle, CAB is a secant, CO = 41 cm, CA = 28 cm and OB = 15. $OE \perp AB$, then AE = …..
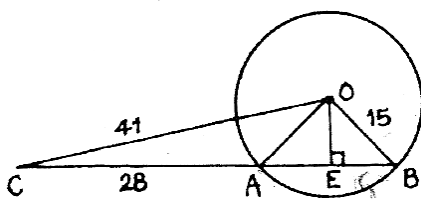
1) 8 cm 2) 10 cm 3) 12 cm 4) 15 cm

157. If sin α and cos α are the roots of $ax^2 + bx + c = 0$, then $a^2 + 2ac = ...$
1) c^2 2) -2ab 3) b^2 4) 0

158. The area enclosed by the curve $|x| + |y| = 1$ is ….

$$\begin{bmatrix} x & = x \ for & x > 0 \\ & x \ for & x \ 0 \\ & 0 \ for & x \ 0 \end{bmatrix}$$

1) 1 square unit 2) 2 square units 3) 3 square units 4) 4 square units

159. $3^9 + 3^{12} + 3^{15} + 3^n$ is a perfect cube, n ∈ N, then the value of n = ……..
1) 18 2) 17 3) 14 4) 16

160. A four digit number has the following properties
i) It is a perfect square
ii) Its first two digits are equal to each other
iii) Its last two digits are equal to each other
Then the four digit number is ….
1) 5566 2) 7744 3) 2288 4) 3399

161. Who sought a cooperative community called New Harmony in Indiana (USA)?
(1)Robert Owe (2)Louis Blanc (3)Friedrich Engels (4) Karl Marx

162. "One people, one empire, one leader", whose slogan is this?
(1)Stalin (2) Adolf Hitler (3) Lenin (4) Benito Mussolini

163. According to the 1878 Forest Act, even the villagers cannot take anything from these classified forests?
(1)Village forests (2) Protected forests (3) Reserved forests (4)All of these

164. Who argued that the state had not created the wind, water, earth and wool, so it could not own it?
(1)Surontiko Samin (2) Dirk van Hogendorp (3)Ho Chi Minh (4)San Jose

165. Find the CORRECT statement in relation with 'Bugyal'?
(1) A dry forest area below the foothills of Garhwal and Kumaon.
(2) Lower ends of grain stalks left in the ground after harvesting
(3) Pastrol community of Maharashtra
(4) Vast meadows in high mountains

166. Find out the WRONG statement.
(1) The head quarters of International Cricket Council is located in Dubai.
(2) Parsis founded the first Indian Cricket Club, the Oriental Cricket Club in Bombay in 1848
(3)The World's First Cricket Club was formed in Hambledon in 1760's.
(4)First One Day International Cricket Match was played in 1977.

23

167. Who was called Mad Bonza by the French?
    (1) Huynh Phu So   (2) Phan Boi Chau
    (3) Liang Qichao   (4) Henri Navarre
168. As a part of this movement, Naidhobi bandhs were organized by panchayats to deprive landlords of the services of even barbers and washermen?
    (1)Gudem Hills of Andhra Pradesh   (2)Peasant Movement of Awadh
    (3)Mepla Movement in Kerala   (4)Kheda Satyagraha in Gujarat
169. "Malabar Beauty" painting was made by
    (1)Raja Ravi Varma   (2)Chandu Menon
    (3) Abanindranath Tagore   (4) Natesha Shastri
170. The architect who rebuilt Paris in 1852 was
    (1)Baron Haussmann   (2)T. E. Turner
    (3)Francis Garnier   (4) Carl Wecker
171. Inquisition means ....
    (1) Action, speech or writing that is seen as opposing the government
    (2)A former Roman Catholic Court for identifying and punishing heretics
    (3)A parchment made from the skin of animal
    (4)A sixteenth century movement to reform the Catholic Church dominated by Rome
172. By the 1860's weavers faced   oblem. They could not get sufficient supply of raw cotton of good quality. Why?
    (1)Drought conditions in India and China
    (2)Ganjam famine
    (3)American civil war
    (4) All of these

173. The famous valley of Kashmir is situated between the mountain ranges of
    (1)Karakoram and Ladakh   (2)Ladakh and Zaskar
    (3)Zaskar and Greater Himalayas (4)Greater Himalayas and Pirpanjal
174. Which of the following is NOT correct in relation with Terai region?
    (1)Dachigam National Park is located in this region.
    (2)It is a swampy and marshy region
    (3)This is a thickly forested region full of wild life
    (4)The forests in Terai region have been cleared to create agricultural land and to settle the migrants from Pakistan after partition.
175. The northern plains get rainfall in winter from
    (1)North cast monsoons
    (2)Local convection
    (3)Depressions originating in the mediterranean sea
    (4)South west monsoons
176. In India, which one of the following types of forests is teak a dominant tree species?
    (1) Tropical evergreen forests
    (2)Tropical moist deciduous forests
    (3)Tropical thorn scrub forests
    (4)Alpine forests

177. What is the share of India's population in world's population, according to 2001 Census?
    (1) 14.2%   (2) 16.7%   (3)19.3%   (4) 11.8%

178. Birth rate means
    (1)the number of live births for every 1000 persons in a year
    (2)The number of live births for every 100 persons in a year
    (3) The number of live births_ for every 1000 persons in a decade
    (4)The number of live births for every 100 persons in a decade

179. Which one of the following is the main cause of land degradation in Maharashtra?
    (1)Intensive cultivation   (2)Over irrigation
    (3)Deforestation   (4)Overgrazing

180. Which one of the following is wrongly matched?
    (1)Endangered species — Indian Rhino '
    (2)Endemic species — Mithun
    (3)Extinct species — Pink head duck
    (4)Vulnerable species — Asiatic Cheetah

181. Match the list **A** with **B** and select the correct answer.

(A)	(B)
A) Wheat	i)Moist and humid climate with rainfall of more than 200 cm
B) Rice	ii)Hot and moist climate with rich soil
C) Tea	iii) Cool growing season and bright sunshine at the time of ripening
D) Rubber	iv) Warm and moist climate with high altitude

Codes	A	B	C	D
1)	iii	ii	iv	i
2)	i	iii	ii	iv
3)	iii	ii	i	iv
4)	iv	iii	i	ii

182. Find out the CORRECT statements.
    i) Balaghat mines in Madhya Pradesh produce 52% of India's copper.
    ii) Odisha is the largest Bauxite producing state in India with 45% of the country's total production.
    iii)Mica deposits are found in the North western part of the Deccan Plateau.
    iv)Kudremukh Mine's iron ore is transported as slurry through a pipe line to port near Mangalore.
    1) i,iii, iv   2) ii, iii, iv   3) i, ii, iv   4) i, ii, iii, iv

183. Which one of the following statements is' NOT CORRECT?
    (1) Kandla is a tidal port.
    (2) Kolkata is an inland riverine port.
    (3)Mangalore is the deepest land locked port.
    (4)Cochin is a natural harbour.

184. In which state is the Shivpuri National Park located?
(1) Maharashtra   (2) Madhya Pradesh
(3) Rajasthan   (4) Uttar Pradesh

POLITICAL SCIENCE

185. Nearly half of the voting power in the IMF is in the hands of only seven countries. Which among these is NOT in the seven countries?
(1) Saudi Arabia   (2) United Kingdom
(3) Germany   (4) France

186. Find the wrong sentence.
(1) Women do not have the right to „vote in Saudi Arabia.
(2) PRI (Institutional Revolutionary Party) is the winning party in Mexico from 1930 to 2000.
(3) In China, the government is always formed by the Chi Party.
(4) Indian-Fijians have not been given right to vote in Fiji.

187. Which of these was the most salient underlying conflict in the making of a democratic constitution in South Africa?
(1) Between South Africa and its neighbours
(2) Between Christians and Muslims
(3) Between- the white majority and the black minority
(4) Between the white minority and the black majority

188. Match list A with list B and select the correct answers using the codes given below the lists

[A]	[B]
A) Universal adult franchise	i) Reservation of seats for the SC's and ST's
B) representation of weaker sections	ii) any one can form a party or contest elections
C) Open political competition	iii) each constituency has roughly the same population
D) one vote one value	iv) every one who is 18 years of age or older has a right to vote

Codes   A   B   C   D
(1)   ii)   iii)   iv   i
(2)   iii)   ii)   i   iv)
(3)   iv   i   ii   iii
(4)   i)   iii)   iv)   ii)

189. A co   tion government in a country is generally formed where there is
(1) one party system   (2) two party system
(3) no party system   (4) multi party system dominated b3 one party

190. Which of these is a mostly spoken language in India after Hindi ?
1) Tamil   2) Bengali   3) Telugu   4) Kannada

191. Which of the these related to political party founders is WRONG ?
1) Bahujans Samaj Party – Kanshiram   2) Jharkhand Party – Baldev Singh
3) Swatantra Party – K.M. Munshi   4) Republican Party of India – B.R. Ambedkar

192. Studies on political and social inequalities in democracy show that …..
1) inequalities exist in democracies   2) inequalities do not exist under dictatorship
3) democracy and development to together   4) dictatorship is better than democracy

ECONOMICS

193. Find the CORRECT statement(s)
     i)Small farmers constitute about 80 percent of total farmers in India.
     ii)Labour is the most abundant factor of production
     iii) Money is called as fixed capital
     iv) Out of every 100 workers in the rural areas in India, only 24 are engaged in non-farm activities
     1) i, iii, iv   2) i, iv   3) i, ii, iv   (4) ii, iii, iv

194. Infant mortality rate means ....
     (1)Death of a child under one year of age
     (2)Death of a child under two years of age
     (3)Death of a child under three years of age
     (4)Death of a child under four years of age

195. Which of the following states, has the high poverty ratio than the India's average poverty ratio?
     (1)Bihar   (2)Assam   (3) Himachal Pradesh   (4) Uttar Pradesh

196. Among the following, who are eligiblE to benefit from MGNREGA?
     (1)Adult members of only SC and SI households
     (2)Adult members of BPI. households
     (3)Adult members of households of all backward communiti
     (4)all adult members of any household

197. What is the body mass index of a person weighing 90 kgs and is 1.82 mts tall?
     (1)27.17   (2)21.42   (3) 29.92   (4) 19.96

198. Consider the following statements about human development index.
     i)HDI stands for Human Development of India.
     ii)Three levels are considered under Gross Enrollment Ratio.
     iii)Per capita income is calculated ir dollers.
     iv)According to the Humar. Development Index, India is developed nation.Which of the given statements are TRUE?
     1)i, ii, iii   2)ii, iii   3)ii, iii, iv   4) i, ii, iii, iv

199. Find the one who DOEs NOT belong to primary sector
     1) Fisherman   2) Flower cultivator   3) Potter   4) Bee- keeper

200. Find the one that is NOT related to starvation deaths
     1) Kalahandi – Odisha   2) Baran – Rajasthan
     3) Kashipur – Madhya Pradesh   4) Palamau - Jharkhand

NTSE – 2016 – Stage I (Andhra Pradesh State)
(For class X Students)

Mental Ability

1. 2	2. 1	3. 4	4. 3	5.1	6. 1	7. 1	8. 2	9. 3	10. 2
11. 1	12. 1	13. 1	14. 3	15. 2	16. 2	17. 3	18. 1	19. 3	20. 1
21. 2	22. 3	23. 3	24. 1	25. 1	26. 4	27. 3	28. 2	29. 1	30. 4
31. 4	32. 2	33. 4	34. 1	35.4	36. 4	37. 2	38. 1	39. 4	40. 2
41.2	42. 3	43. 3	44. 5	45. 5	46. 1	47. 5	48. 1	49. 3	50. 1

Language Comprehensive

51.3	52. 2	53. 3	54. 1	55. 2	56. 2	57. 4	58. 3	59. 3	60. 3
61.1	62. 2	63. 3	64. 1	65. 2	66. 4	67. 3	68. 1	69. 2	70. 1
71. 3	72. 2	73. 1	74. 4	75. 1	76. 1	77. 4	78. 3	79. 3	80. 2
81. 3	82. 1	83. 2	84. 4	85.2	86. 1	87. 3	88. 3	89. 4	90. 3
91. 2	92. 2	93. 4	94. 3	95. 1	96. 2	97. 3	98. 1	99. 4	100. 1

Physics

101. 4	102. 1	103. 1	104. 4	105. 1	106. 2	107. 3	108. 2	109. 2	110.2
111.3	112. 3	113. 1							

Chemistry

114.a	115.c	116.b	117.b	118.b	119.b	120.c	121.a	122.d	123.d
124.d	125.b	126.c,d							

Biology

127.a	128.d	129.b	130.b	131.c	132.c	133.a	134.c	135.b	136.c
137.c	138.c	139.d	140.b						

Maths

141. 1	142. 1	143. 2	144. 3	145. 4	146. 2	147. 1	148. 3	149. 2	150.1
151. 4	152. 3	153. 1	154. 2	155. 2	156. 3	157. 3	158. 2	159. 3	160. 2

History

161. 1	162. 2	163. 3	164. 1	165. 4	166. 4	167. 2	168. 2	169. 1	170. 1
171. 2	172. 2								

Geography

173. 4	174. 1	175. 3	176. 2	177. 2	178. 1	179. 4	180. 4	181. 1	182. 3
183. 3	184. 2								

Political Science

185. 1	186. 4	187. 3	188. 3	189. 4	190.2	191. 2	192. 3

Economics

193. 3	194. 1	195. 1	196. 3	197. 1	198. 3	199. 3	200. 3