

FIITJEE INTERNAL TEST SIMULATION TEST

for

NTSE STAGE – I

(All Class X Batches)

Mental Ability Test (MAT)

QP CODE:

Time: 120 Minutes

Maximum Marks: 100

Please read the instructions carefully.

INSTRUCTIONS

A: General :

1. Immediately fill in the particulars on this page of the Test Booklet with Blue/Black Ball point pen.
2. Use **Blue/Black Ball Point Pen only** for writing particulars on **Side-1** and **Side-2** of the Answer Sheet. **Use of pencil is strictly prohibited.**
3. Darken the appropriate bubbles with **HB Pencil** only.
4. Blank papers, clipboards, log tables, slide rules, calculators, cellular phones, pagers and electronic gadgets in any form are not allowed.
5. The answer sheet, a machine-gradable Objective Response Sheet (ORS) is provided separately.
6. Do not Tamper/mutilate the **ORS** or this booklet.
7. No additional sheets will be provided for rough work
8. On completion of this test, the candidate must hand over the Answer Sheet to the Invigilator on duty in the Room/Hall. **However, the candidates are allowed to take away this Test Booklet with them.**

B: Questions paper format and Marking Scheme :

1. The question paper consists of 100 questions.
2. For each question you will be **awarded 1 mark** if you darken the bubble corresponding to the correct answer and zero mark if no bubbles is darkened or your response is incorrect.

Enrollment No. : Batch : _____

Name : _____

Candidate's Signature _____ Invigilator's Signature: _____

1. $3x^3 + 2x^2 + 3x + 2 = ?$
 (A) $(3x - 2)(x^2 - 1)$ (B) $(3x - 2)(x^2 + 1)$
 (C) $(3x + 2)(x^2 - 1)$ (D) $(3x + 2)(x^2 + 1)$
 1. **D**
2. $4a^2 + b^2 + 4ab + 8a + 4b + 4 = ?$
 (A) $(2a + b + 2)^2$ (B) $(2a - b + 2)^2$
 (C) $(a + 2b + 2)^2$ (D) none of these
 2. **A**
3. Zinc and copper are melted together in the ratio 9:11. What is the weight of melted mixture, if 28.8 kg of zinc has been consumed in it?
 (A) 58 kg (B) 60 kg
 (C) 64 kg (D) 70 kg
 3. **C**
4. In a division sum, the divisor is 10 times the quotient and five times the remainder. What is the dividend, if the remainder is 46?
 (A) 5326 (B) 5306
 (C) 5336 (D) 5366
 4. **C**
5. In a division sum, the quotient is 75, the remainder is 95, the divisor is equal to the sum of the quotient and remainder, what is the dividend?
 (A) 13845 (B) 12845
 (C) 12840 (D) 12485
 5. **B**
6. What is the sum of all the numbers between 300 and 1000 which are divisible by 179?
 (A) 2517 (B) 2527
 (C) 2607 (D) 2506
 6. **D**
7. What is the value of $\frac{1}{6 \times \frac{1}{8 \div \frac{1}{1 - \frac{7}{8}}}} + \frac{5}{6} = ?$
 (A) 4 (B) 3
 (C) 1 (D) 5
 7. **C**
8. After taking out $\frac{1}{5}$ of the contents from a purse, it was found that $\frac{1}{12}$ of the remainder was equal to Rs 7.40. What sum did the purse contain at first?
 (A) Rs 160 (B) Rs 210
 (C) Rs 211 (D) Rs 111
 8. **D**

9. The sum of two numbers is 27 and difference of their squares is 351. The greater of the two numbers is:
 (A) 18 (B) 24
 (C) 23 (D) 20
D
10. When $p(x) = x^3 - ax^2 + x$ is divided by $(x - a)$, the remainder is
 (A) 0 (B) a
 (C) 2a (D) 3a
B
11. In a right triangle ABC with angle A equal to 90° , find angle B and C so that $\sin(B) = \cos(B)$.
 (A) 45,45 (B) 60,30
 (C) 30,60 (D) Not Possible
A
12. In what proportion must salt at 75 paise a kg be mixed with sugar at Rs. 5.50 a kg so that the mixture may be worth Rs 4.50 a kg?
 (A) 3:11 (B) 4:15
 (C) 15:11 (D) 4:5
B
13. If the ratio of areas of two circles is 4:9, then the ratio of their circumferences will be:
 (A) 2:3 (B) 3:2
 (C) 4:9 (D) 9:4
A
14. If both the radius and height of a right circular cone are increased by 20%, its volume will be increased by:
 (A) 20% (B) 40%
 (C) 60% (D) 72.8%
D
15. If $\frac{a}{3} = \frac{b}{4} = \frac{c}{7}$, then $\frac{a+b+c}{c}$ is equal to
 (A) 7 (B) 2
 (C) 1/2 (D) 1/7
B
16. How many kilograms of sugar at Rs 3.80 per kg be mixed with 60 kgs of sugar at Rs 4.60 per kg, so that by selling the mixture at Rs 5.20 per kg, there may be gain of 30%?
 (A) 180 kg (B) 185 kg (C) 190 kg (D) 199 kg
A
17. The median and mode of frequency distribution are 26 and 29 respectively. Then, the mean is
 (A) 27.5 (B) 24.5
 (C) 28.5 (D) 25.8
B

18. If on selling 12 notebooks, a seller makes a profit equal to the selling price of 4 notebooks, what is his percent profit?
 (A) $16\frac{2}{3}$ (B) 25
 (C) 50 (D) Data inadequate
18. C
19. For what values of k does the pair of equation $x - 2y = 3$ and $3x + ky = 1$ have a unique solution?
 (A) $k = -6$ (B) $k = 0$ only
 (C) $k \neq 0$ (D) $k \neq -6$
19. D
20. The roots of the equation $3^{x+2} + 3^{-x} = 10$ are
 (A) 2, 0 (B) -2, 0
 (C) 3, -1 (D) -3, 1
20. B
21. In a cyclic quadrilateral ABCD, it is being given that $\angle A = (x + y + 10)^\circ$, $\angle B = (y + 20)^\circ$, $\angle C = (x + y - 30)^\circ$ and $\angle D = (x + y)^\circ$. Then, $\angle B = ?$
 (A) 70° (B) 80°
 (C) 100° (D) 110°
21. B
22. An open box is made of wood 2 cm thick. Its internal dimension is 86 cm \times 46 cm \times 38 cm. What is the cost of painting the outer surface of this box @ Rs. 10 per m^2 ?
 (A) Rs. 12.35 (B) Rs. 8.85
 (C) Rs. 15.70 (D) Rs. 16.50
22. C
23. A contractor undertook to do a certain work in 75 days and employed 400 men for the purpose. At the end of 25 days, $\frac{1}{4}$ of the work is done. How many extra men must he employ to finish the work in time?
 (A) 200 (B) 150
 (C) 125 (D) 100
23. A
24. The ratio of the sum and product of the roots of the equation $7x^2 - 12x + 18 = 0$ is
 (A) 7:12 (B) 7:18
 (C) 2:3 (D) 3:2
24. C
25. After interchanging 'x' and '+', '12' and '16', which one of the following options will be correct?
 (A) $(60 \div 16) \times 14 = 70$ (B) $(55 - 12) + 3 = 42$
 (C) $(40 \times 8) - 12 = 36$ (D) $(36 + 10) \div 16 = 30$
25. D
26. A vessel has 200 ml of pure alcohol. 20 ml of alcohol is removed and 20 ml of water is poured into the vessel. (bringing back the volume of mixture back to 200 ml). If this operation is repeated another 2 times. What is the percentage of alcohol in the vessel in the end?
 (A) 90% (B) 70%
 (C) 75% (D) 72.9%
26. D

27. Choose the odd numeral pair / group in the following question.
 (A) 2:4 (B) 4:8
 (C) 6:18 (D) 8:32
27. **A**
28. Six persons – Kamal, Srikanth, Pragathi, Keerthi, Vasana and Sravan – are seated in six equally spaced chairs around a circular table (facing the center). Srikanth and Sravan are opposite to each other. Pragathi and Vasana are not seated next to Srikanth. Who is sitting between Keerthi and Kamal?
 (A) Srikanth (B) Sravan
 (C) Pragathi (D) Vasana
28. **A**
29. The minimum number of colours required to paint all the sides of a cube that no two adjacent faces may have the same colours, is
 (A) 1 (B) 2
 (C) 3 (D) 6
29. **C**
30. In a meeting, each person shake hands to the other person once. There was a total of 120 shake – hands. So, how many people were there in the meeting?
 (A) 16 (B) 15
 (C) 14 (D) 12
30. **A**

Directions (Questions 31 – 34): Find the wrong term in the series:

31. Find the wrong term in the series
 4, 5, 12, 39, 160, 815, 4836
 (A) 4836 (B) 815
 (C) 39 (D) 4
31. **B**
32. Find the wrong term in the series
 68, 99, 136, 177, 219, 267
 (A) 219 (B) 267
 (C) 136 (D) 68
32. **A**
33. Find the wrong term in the series
 2, 12, 36, 80, 160, 252, 392
 (A) 36 (B) 252
 (C) 160 (D) 392
33. **C**
34. Find the wrong term in the series
 999, 728, 511, 342, 215, 125, 63
 (A) 215 (B) 125
 (C) 342 (D) 728
34. **B**
35. 664, 332, 340, 170, ____, 89
 (A) 85 (B) 97
 (C) 109 (D) 178
35. **D**

36. A motorist covers a distance of 39 km in 45 minutes by moving at a speed of x kmph for the first 15 minutes, then moving at double the speed for the next 20 minutes and then again moving at his original speed for the rest of the journey. Then, x is equal to:
 (A) 31.2 (B) 36
 (C) 40 (D) 52

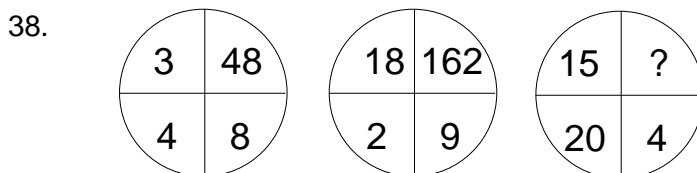
36. **B**

37. At what time between 3 O' clock and 4 O' clock, will the hands of a clock be 4 min apart?

- (A) $20\frac{8}{11}$ min past 3 and 12 min past 3
 (B) $20\frac{8}{11}$ min past 3 and 13 min past 3
 (C) $20\frac{8}{7}$ min past 3 and 12 min past 3
 (D) $20\frac{8}{9}$ min past 3 and 14 min past 3

37. **A**

Directions (Question 38): In the following question, a set of figures carrying certain characters is given. Assuming that the characters in each set follow a similar pattern, find the missing character in each case.



- (A) 600 (B) 550
 (C) 435 (D) 172

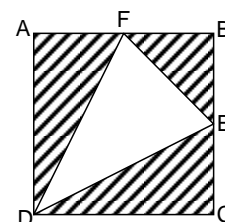
38. **A**

39. The roots of the equation $2x^2 - 6x + 3 = 0$ are
 (A) real, unequal and rational (B) real, unequal and irrational
 (C) real and equal (D) imaginary

39. **B**

40. ABCD is a square. F and E are mid points AB and BC respectively. Find ratio of shaded and Unshaded area.

- (A) 3 : 5
 (B) 1 : 5
 (C) 5 : 3
 (D) 5 : 2



40. **C**

41. The area of the ΔOAB with $O(0, 0)$, $A(4, 0)$ and $B(0, 6)$ is
 (A) 8 sq units (B) 12 sq units
 (C) 16 sq units (D) 24 sq units

41. **B**

42. A tap can fill a tank in 6 hours. After half the tank is filled, three more similar taps are opened. What is the total time taken to fill the tank completely?

- (A) 3 hours 15 min (B) 3 hours 45 min
 (C) 3 hours 40 min (D) 3 hours 50 min

42. **B**

43. If the simple interest on a sum of money at 5% per annum for 3 years is Rs 1200, find the compound interest on the same sum for the same period at the same rate.
 (A) Rs 1251 (B) Rs 1261
 (C) Rs 1241 (D) None of these
43. **B**
44. When $(x^{31} + 31)$ is divided by $(x+1)$, the remainder is
 (A) 0 (B) 1
 (C) 30 (D) 31
44. **C**

Directions (Questions 45 – 49):

Study the following table carefully and answer the questions given below.

CLASSIFICATION OF 100 STUDENTS BASED ON THE MARKS OBTAINED BY THEM IN PHYSICS AND CHEMISTRY IN AN EXAMINATION.

Marks out of 50 \ Subject	40 & Above	30 & above	20 & above	10 & above	0 and above
Physics	9	32	80	92	100
Chemistry	4	21	66	81	100
(Aggregate) Average	7	27	73	87	100

45.

Study the following table carefully and answer the questions given below.

CLASSIFICATION OF 100 STUDENTS BASED ON THE MARKS OBTAINED BY THEM IN PHYSICS AND CHEMISTRY IN AN EXAMINATION.

Marks out of 50 \ Subject	40 & Above	30 & above	20 & above	10 & above	0 and above
Physics	9	32	80	92	100
Chemistry	4	21	66	81	100
(Aggregate) Average	7	27	73	87	100

The number of students scoring less than 40% marks in aggregate is:

- (A) 13 (B) 19
 (C) 20 (D) 27
45. **D**

46

Study the following table carefully and answer the questions given below.

CLASSIFICATION OF 100 STUDENTS BASED ON THE MARKS OBTAINED BY THEM IN PHYSICS AND CHEMISTRY IN AN EXAMINATION.

Marks out of 50 \ Subject	40 & Above	30 & above	20 & above	10 & above	0 and above
Physics	9	32	80	92	100
Chemistry	4	21	66	81	100
(Aggregate) Average	7	27	73	87	100

If at least 60% marks in Physics are required for pursuing higher studies in Physics, how many students will be eligible to pursue higher studies in Physics?

- (A) 27 (B) 32
(C) 34 (D) 41

46. **B**

47.

Study the following table carefully and answer the questions given below.

CLASSIFICATION OF 100 STUDENTS BASED ON THE MARKS OBTAINED BY THEM IN PHYSICS AND CHEMISTRY IN AN EXAMINATION.

Marks out of 50 \ Subject	40 & Above	30 & above	20 & above	10 & above	0 and above
Physics	9	32	80	92	100
Chemistry	4	21	66	81	100
(Aggregate) Average	7	27	73	87	100

What is the difference between the number of students passed with 30 as cut – off marks in Chemistry and those passed with 30 as cut off marks in aggregate?

- (A) 3 (B) 4
(C) 5 (D) 6

47. **D**

48

Study the following table carefully and answer the questions given below.

CLASSIFICATION OF 100 STUDENTS BASED ON THE MARKS OBTAINED BY THEM IN PHYSICS AND CHEMISTRY IN AN EXAMINATION.

Marks out of 50 \ Subject	40 & Above	30 & above	20 & above	10 & above	0 and above
Physics	9	32	80	92	100
Chemistry	4	21	66	81	100
(Aggregate) Average	7	27	73	87	100

The percentage of the number of students getting at least 60% marks in Chemistry over those getting at least 40% marks in aggregate, is approximately:

- (A) 21% (B) 27%
(C) 29% (D) 31%

48. **C**

49.

Study the following table carefully and answer the questions given below.

CLASSIFICATION OF 100 STUDENTS BASED ON THE MARKS OBTAINED BY THEM IN PHYSICS AND CHEMISTRY IN AN EXAMINATION.

Marks out of 50	40 & Above	30 & above	20 & above	10 & above	0 and above
Subject					
Physics	9	32	80	92	100
Chemistry	4	21	66	81	100
(Aggregate) Average	7	27	73	87	100

If it is known that at least 23 students were eligible for a Symposium on Chemistry, the minimum qualifying marks in Chemistry for eligibility to Symposium would lie in the range

- (A) 40 – 50 (B) 30 – 40
(C) 20 – 30 (D) Below 20

49. **C**

50. The volume of a right circular cone of height 12 cm and base radius 6 cm, is

- (A) $(12\pi)\text{cm}^3$ (B) $(36\pi)\text{cm}^3$
(C) $(72\pi)\text{cm}^3$ (D) $(144\pi)\text{cm}^2$

50. **D**

51. GTB, CYV, YDP, ___ QND

- (A) DIV (B) UIJ
(C) DDV (D) UVV

51. **B**

Directions (Questions 52 – 55):

Study the following series of the alpha numerical symbol combination and answer the questions that follow:

S K 6 ζ Q 2 R * C F 8 E \$ G 2 # 4 9 L N 3 U V 5 Y a B 7 W 9

52.

Study the following series of the alpha numerical symbol combination and answer the questions that follow:

S K 6 ζ Q 2 R * C F 8 E \$ G 2 # 4 9 L N 3 U V 5 Y a B 7 W 9

How many symbols are there in the above arrangement each of which is immediately preceded by but not immediately followed by a letter of English alphabet?

- (A) Nil (B) One
(C) Two (D) Three

52. **A**

53.

Study the following series of the alpha numerical symbol combination and answer the questions that follow:

S K 6 ζ Q 2 R * C F 8 E \$ G 2 # 4 9 L N 3 U V 5 Y a B 7 W 9

What should come in place of question mark in the following series?

56.

This question are based on the following information.

Each of the four friends – Mahendar, Niranjan, Sridhar and Veeru are from four different cities – Ahmedabad, Bangalore, Hyderabad and Kolkata and have one car each among – Ferrari, Reynault, Mc. Laren and Williams, not necessarily in the same order. We know the following additional information.

- (i) Niranjan is neither from Kolkata nor he has Williams.
- (ii) Sridhar does not have Mc. Laren.
- (iii) Veeru has Ferrari but is not from Kolkata.
- (iv) Mahendar is from Ahmedabad.
- (v) The person from Kolkata does not have Williams and the person from Hyderabad does not have Mc. Laren.

Niranjan is from which city?

- (A) Ahmedabad
- (B) Bangalore
- (C) Hyderabad
- (D) Either (A) or (B)

56. **B**

57.

This question are based on the following information.

Each of the four friends – Mahendar, Niranjan, Sridhar and Veeru are from four different cities – Ahmedabad, Bangalore, Hyderabad and Kolkata and have one car each among – Ferrari, Reynault, Mc. Laren and Williams, not necessarily in the same order. We know the following additional information.

- (i) Niranjan is neither from Kolkata nor he has Williams.
- (ii) Sridhar does not have Mc. Laren.
- (iii) Veeru has Ferrari but is not from Kolkata.
- (iv) Mahendar is from Ahmedabad.
- (v) The person from Kolkata does not have Williams and the person from Hyderabad does not have Mc. Laren.

The person from which city has Mc. Laren?

- (A) Bangalore
- (B) Kolkata
- (C) Ahmedabad
- (D) Either (A) or (B)

57. **A**

58.

This question are based on the following information.

Each of the four friends – Mahendar, Niranjan, Sridhar and Veeru are from four different cities – Ahmedabad, Bangalore, Hyderabad and Kolkata and have one car each among – Ferrari, Reynault, Mc. Laren and Williams, not necessarily in the same order. We know the following additional information.

- (i) Niranjan is neither from Kolkata nor he has Williams.
- (ii) Sridhar does not have Mc. Laren.
- (iii) Veeru has Ferrari but is not from Kolkata.
- (iv) Mahendar is from Ahmedabad.
- (v) The person from Kolkata does not have Williams and the person from Hyderabad does not have Mc. Laren.

Who has Williams?

- (A) Niranjan
- (B) Sridhar
- (C) Mahendar
- (D) Either (A) or (B)

58. **C**

59.

This question are based on the following information.

Each of the four friends – Mahendar, Niranjn, Sridhar and Veeru are from four different cities – Ahmedabad, Bangalore, Hyderabad and Kolkata and have one car each among – Ferrari, Reynault, Mc. Laren and Williams, not necessarily in the same order. We know the following additional information.

- (i) Niranjn is neither from Kolkata nor he has Williams.
- (ii) Sridhar does not have Mc. Laren.
- (iii) Veeru has Ferrari but is not from Kolkata.
- (iv) Mahendar is from Ahmedabad.
- (v) The person from Kolkata does not have Williams and the person from Hyderabad does not have Mc. Laren.

Which of the following combinations is true?

- (A) Sridhar – Kolkata – Williams
- (B) Sridhar – Bangalore – Reynault
- (C) Sridhar – Kolkata – Reynault
- (D) Niranjn – Hyderabad – Mc. Laren

59. **C**

Directions (Questions 60): Insert the missing number.

60.

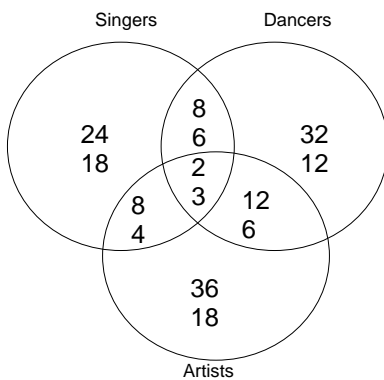
14	9	12	20
4	9	8	10
12	13	7	20
3	3	11	?
20	42	19	40

- (A) 2
- (B) 8
- (C) 12
- (D) 14

60. **B**

Directions (Questions 61 – 63):

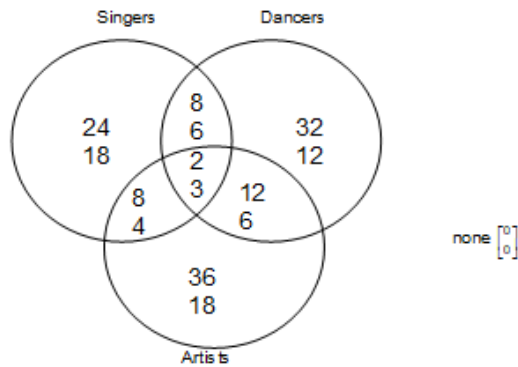
This question are based on the diagram given below. In this diagram, the number on the top gives the number of males and the number below it is the number of females. i.e., $\begin{bmatrix} 24 \\ 18 \end{bmatrix}$ means there are 24 males and 18 females.



none $\begin{bmatrix} 0 \\ 0 \end{bmatrix}$

61.

This question are based on the diagram given below. In this diagram, the number on the top gives the number of males and the number below it is the number of females. i.e., $\begin{bmatrix} 24 \\ 18 \end{bmatrix}$ means there are 24 males and 18 females.



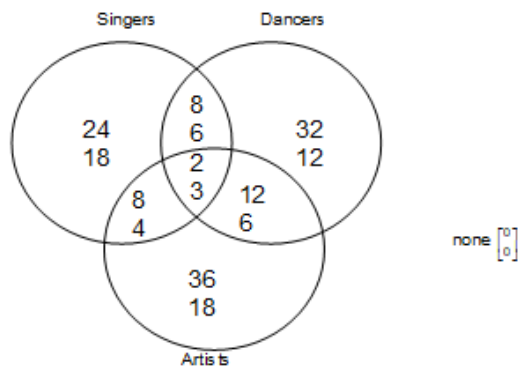
How many female singers are also dancers?

- (A) 9
- (B) 3
- (C) 14
- (D) 6

61. **A**

62.

This question are based on the diagram given below. In this diagram, the number on the top gives the number of males and the number below it is the number of females. i.e., $\begin{bmatrix} 24 \\ 18 \end{bmatrix}$ means there are 24 males and 18 females.



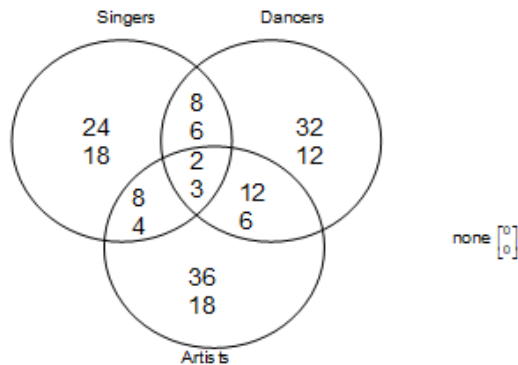
How many dancers are artists?

- (A) 18
- (B) 12
- (C) 6
- (D) 23

62. **D**

63.

This question are based on the diagram given below. In this diagram, the number on the top gives the number of males and the number below it is the number of females. i.e., $\begin{bmatrix} 24 \\ 18 \end{bmatrix}$ means there are 24 males and 18 females.



How many females are not singers?

- (A) 24
- (B) 39
- (C) 36
- (D) 45

63. **C**

Directions (Questions 64): Insert the missing number.

64.

6	15	20
8	4	5
3	5	20
51	65	?

- (A) 12
- (B) 56
- (C) 120
- (D) 51

64. **C**

Directions (Question 65 – 66):

Study the following information to answer the given question:

In a certain code '**a friend of mine**' is written as '4 9 1 6', '**mine lots of metal**' is written as '3 1 0 9' and '**a piece of metal**' is written as '7 1 6 3'.

65.

Study the following information to answer the given question:

In a certain code '**a friend of mine**' is written as '4 9 1 6', '**mine lots of metal**' is written as '3 1 0 9' and '**a piece of metal**' is written as '7 1 6 3'.

What does '9' stand for?

- (A) of
- (B) mine
- (C) friend
- (D) lots

65. **B**

66.

Study the following information to answer the given question:

In a certain code '*a friend of mine*' is written as '4 9 1 6', '*mine lots of metal*' is written as '3 1 0 9' and '*a piece of metal*' is written as '7 1 6 3'.

'6 7 3' would mean

(A) a metal piece (B) metal for friend (C) piece of advise (D) large metal piece

66. **A**

67. In a certain code language, if Pen means Eraser, Eraser means Book, Book means Scale, Scale means Sharpener, Sharpener means Duster and Duster means Table, then what is the name of the object that is used to clean the black board in the language?

(A) Duster (B) Sharpener
(C) Scale (D) Table

67. **B**

Directions (Questions 68 – 70):

In a round table conference six persons are participating. (They all are seating facing the centre) They are Andy, Bob, Charles, Douglas, Elena and Fred. Bob is sitting between Charles and Elena and is opposite to Andy. Douglas is sitting to the left of Elena.

68.

In a round table conference six persons are participating. (They all are seating facing the centre) They are Andy, Bob, Charles, Douglas, Elena and Fred. Bob is sitting between Charles and Elena and is opposite to Andy. Douglas is sitting to the left of Elena.

Who is sitting opposite to Douglas?

(A) Andy (B) Bob
(C) Charles (D) Fred

68. **C**

69.

In a round table conference six persons are participating. (They all are seating facing the centre) They are Andy, Bob, Charles, Douglas, Elena and Fred. Bob is sitting between Charles and Elena and is opposite to Andy. Douglas is sitting to the left of Elena.

Who is sitting to the left of Bob?

(A) Charles (B) Elena
(C) Douglas (D) Andy

69. **B**

70.

In a round table conference six persons are participating. (They all are seating facing the centre) They are Andy, Bob, Charles, Douglas, Elena and Fred. Bob is sitting between Charles and Elena and is opposite to Andy. Douglas is sitting to the left of Elena.

If Elena interchanges her place with the person sitting opposite to Bob, then who sits to the right of Fred?

(A) Andy (B) Charles
(C) Bob (D) None of these

70. **D**

71. If – stands for +, + stands for –, x stands for ÷ and ÷ stands for x, the which of the following is correct.
- (A) $40 - 10 + 20 \times 10 \div 4 = 40$ (B) $10 - 8 \div 4 \times 8 + 9 = 5$
 (C) $31 + 5 \times 3 \div 4 - 9 = 21$ (D) $40 - 30 \times 10 + 5 \div 7 = 10$

71. **B**

72. In a certain code language, the letters in the English alphabet are coded as follows, based on their place values. Each letter with a multiple of 2 as place value are given 1 as code, and the ones with a multiple of 3 as place value are given 2 as code, in case of a clash, 1 prevails and the rest of the letters are given 3 as code. Then what is the code for the word ALPHABET?
- (A) 313131113 (B) 31113131
 (C) 13331313 (D) 31131131

72. **B**

Directions (Question 73): In a family A is younger brother of B, and D is the son of B. D is brother of E but E is not son of B. F is grandson of B and C is cousin of E.

73. The relation of C with A is
- (A) Father (B) Son
 (C) Mother (D) Cannot be determined

73. **D**

74. In this question, a word is represented by only one set of numbers as given in any one of the alternatives. The sets of numbers given in the alternatives are represented by two classes of alphabets as in the two given matrices. The columns and rows of Matrix I are numbered from 0 to 4 and those of Matrix II from 5 to 9. A letter from these matrices can be represented first by its row and then the column. You have to identify the correct set for the word "CARE"

	0	1	2	3	4
0	C	O	B	A	I
1	O	B	A	I	C
2	B	A	I	C	O
3	A	I	C	O	B
4	I	C	O	B	A

	5	6	7	8	9
5	W	E	R	M	L
6	E	R	M	L	W
7	R	M	L	W	E
8	M	L	W	E	R
9	L	W	E	R	M

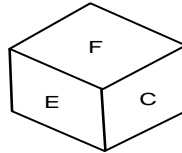
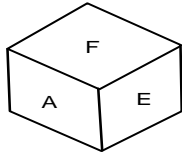
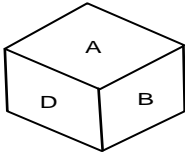
- (A) 23, 03, 75, 78 (B) 23, 21, 75, 79
 (C) 23, 21, 00, 79 (D) 23, 21, 75, 87

74. **B**

75. If – stands for division, + for multiplication, ÷ for subtraction and x for addition, then which one of the following equation is correct?
- (A) $19 + 5 - 4 \times 2 \div 4 = 11$ (B) $19 \times 5 - 4 \div 2 + 4 = 16$
 (C) $19 \div 5 + 4 - 2 \times 4 = 13$ (D) $19 \div 5 + 4 + 2 \div 4 = 20$

75. **C**

76.



Which letter is on the opposite face of letter C?

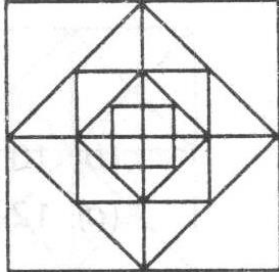
- (A) D (B) A
(C) B (D) C

76.

B

77.

How many squares are there in the figure given below?



- (A) 12 (B) 13
(C) 16 (D) 17

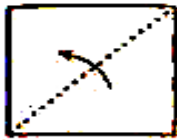
77.

D

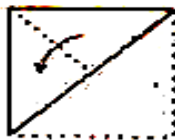
Directions (Question 78): In the following question, a piece is folded in the manner shown in the question figure(s). Select the figure out of the answer choices showing the unfolded appearance after the cut.

78.

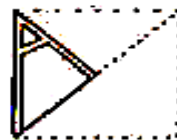
Question Figures



X



Y



Z

Answer Figures



(A)



(B)



(C)

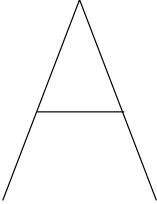


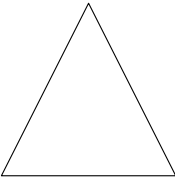
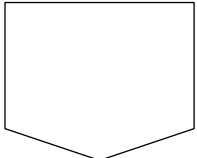


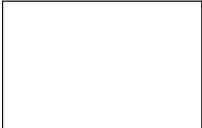
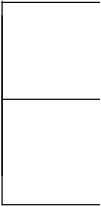
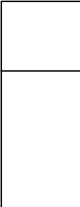
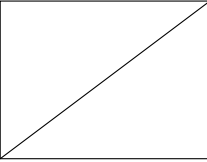
(D)

78.

B

Directions (Question 79): In this question, group the given figures into three classes using each figure only once.

79.					
	1	2	3	4	5

			
6	7	8	9

- (A) 1, 3, 4; 2, 5, 9; 6, 7, 8
 (C) 1, 5, 9; 2, 4, 7; 3, 6, 8

- (B) 1, 2, 3; 4, 5, 6; 7, 8, 9
 (D) 3, 7, 8; 1, 6, 5; 4, 2, 9

79. **A**

Directions (Question 80): Select the combination of numbers so that letters arranged accordingly will form meaning word.

80. E S R E V E R
 1 2 3 4 5 6 7

(A) 7654321

(B) 5423167

(C) 1547326

(D) 2463571

80. **A**

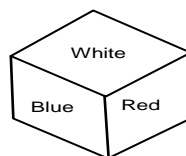
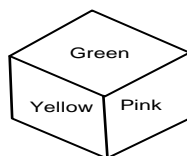
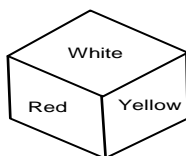
81. If MOST + MOST = TOKYO, and all the alphabet will be replaced by digits, then what will be the value of T + O? (same alphabets should be replaced by same digits and T is not zero)

- (A) 2
 (C) 3

- (B) 1
 (D) 5

81. **C**

82.



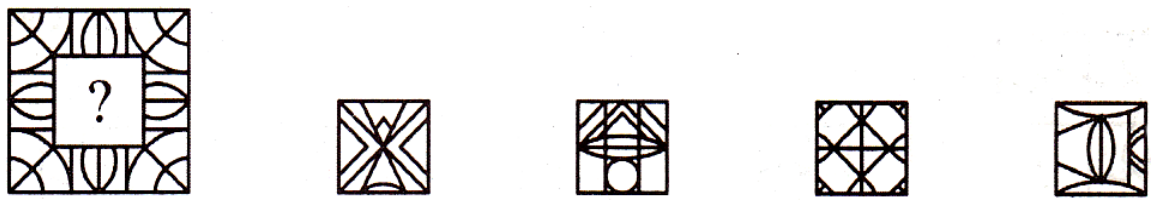
Which colour is opposite to yellow colour?

- (A) White
 (C) Blue

- (B) Green
 (D) Pink

82. **C**

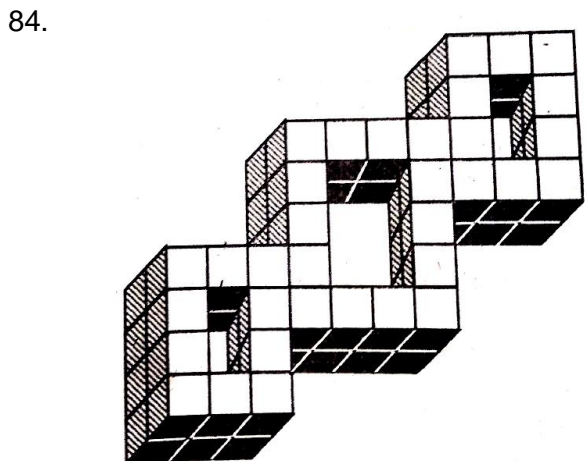
Directions (Question 83) : In the following question, Select a figure form amongst the four alternatives, which when placed in the blank space of fig. (X) would complete the pattern.

83. 

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

83. **C**

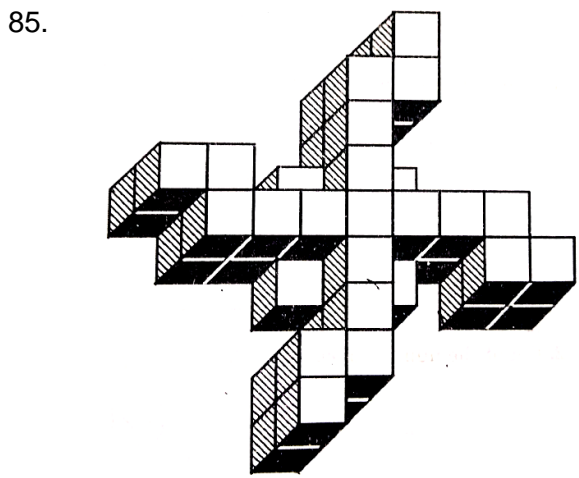
Directions (Questions 84 – 85): Count the number of cubes in each of the following figures:



- (A) 66
- (B) 67
- (C) 68
- (D) 72

84. **C**

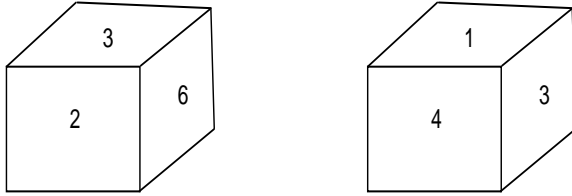
Count the number of cubes in each of the following figures:



- (A) 41
- (B) 46
- (C) 52
- (D) 49

85. **B**

86. Two different views of a cube are given. The faces of the cube are numbered from 1 to 6.



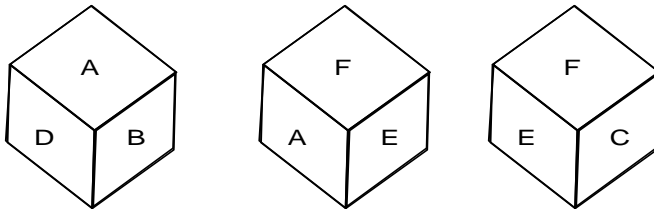
Which number is there on the face opposite to the face having number 2?

- (A) 1
- (B) 3
- (C) 5
- (D) 4

86. **A**

Directions (Question 87): This question is based on the different faces of a dice.

87.

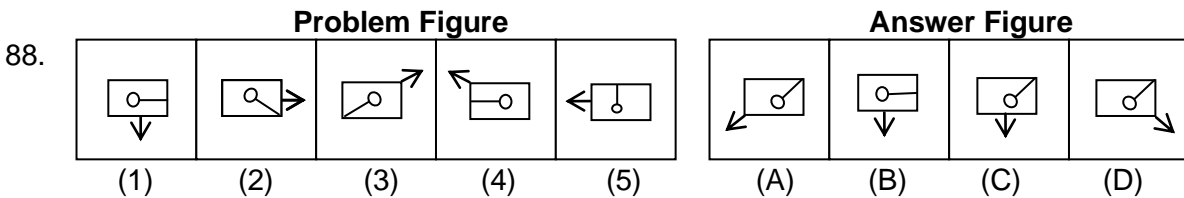


Which letter is on the opposite face of letter C?

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

87. **B**

Directions (Question 88): Select a figure from amongst the answer figures which will continue the same series as established by the problem figures.



88. **C**

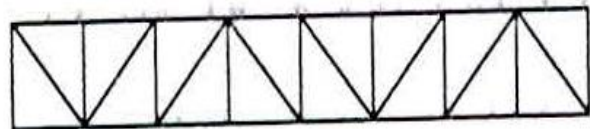
89. If in a certain code language 'PARENT' is written as 'BDFGJK' and 'CHILDREN' is written as 'MOXQUFGJ', then how will 'REPRINT' be written in that language?

- (A) FGBFXGO
- (B) BGBFXJK
- (C) FGBUXJK
- (D) FGBFXJK

89. **D**

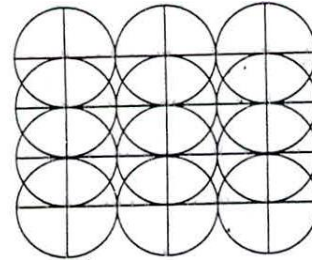
90. Find the number of triangles in the given figure.

- (A) 16
- (B) 20
- (C) 12
- (D) 24



90. **B**

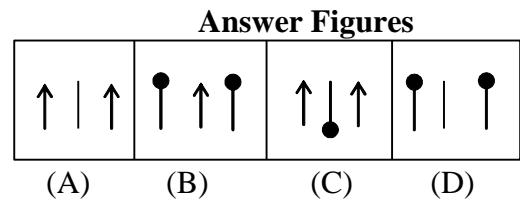
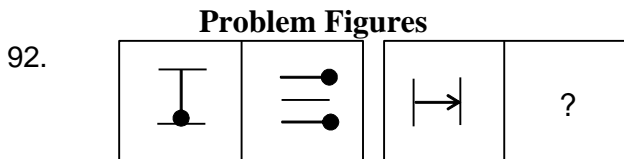
91. Find the number of semicircles in the given figure?
 (A) 24 (B) 32
 (C) 48 (D) 64



91. C

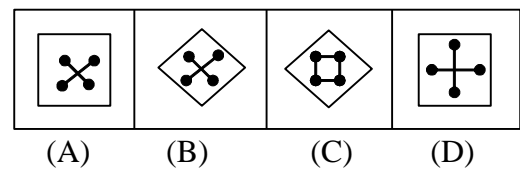
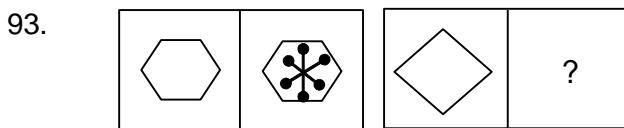
Directions (Questions 92 – 93):

The second figure in the first unit of the problem figures bears a certain relationship to the first figure. Similarly, one of the figures in the answer figures bears the same relationship to the first figure in the second unit of the problem figures. You are, therefore, to locate the figure which would fit the question-mark (?).



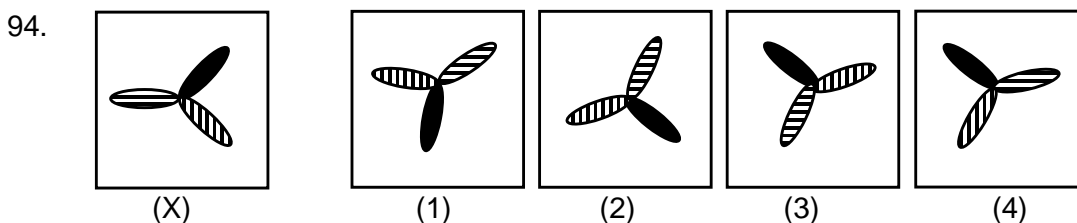
92. A

The second figure in the first unit of the problem figures bears a certain relationship to the first figure. Similarly, one of the figures in the answer figures bears the same relationship to the first figure in the second unit of the problem figures. You are, therefore, to locate the figure which would fit the question-mark (?).



93. B

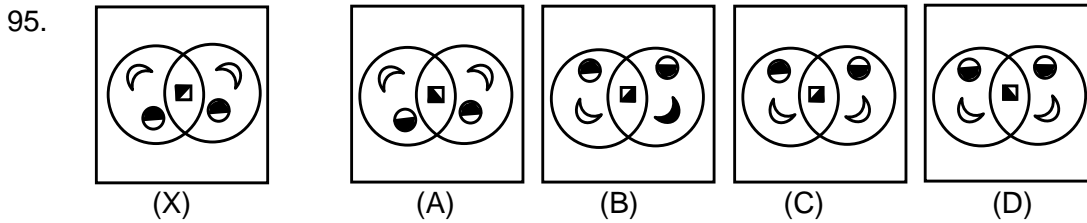
Directions (Question 94): In the following question, choose the correct mirror – image of the figure (X) from amongst four alternatives (1), (2), (3) and (4), given along with it. (Choose the best possible option)



- (A) 1 (B) 2
 (C) 3 (D) 4

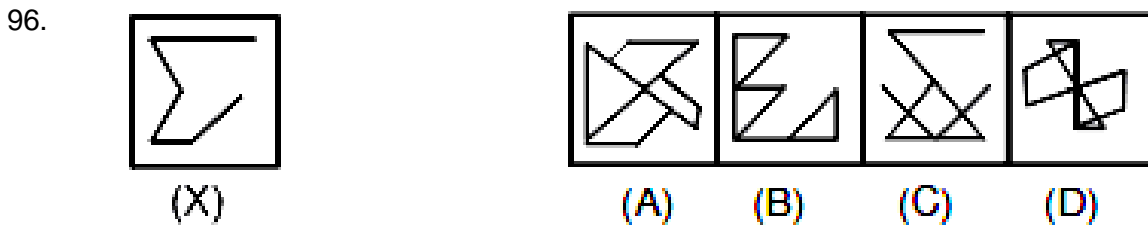
94. D

Directions (Question 95): Find the water images of the given figures



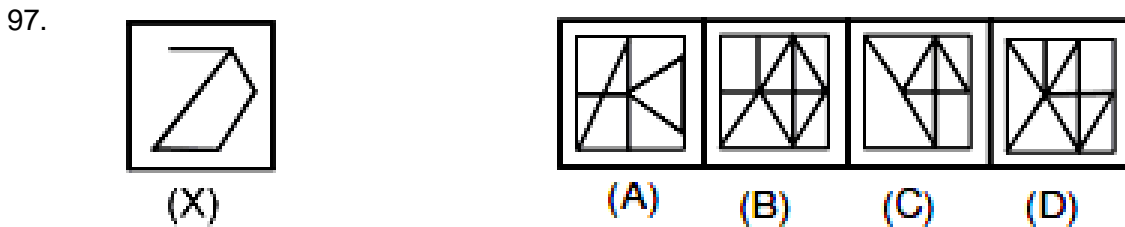
95. D

Directions (Questions 96 – 98): In the following question, choose the alternative figure in which the question figure (X) is embedded.



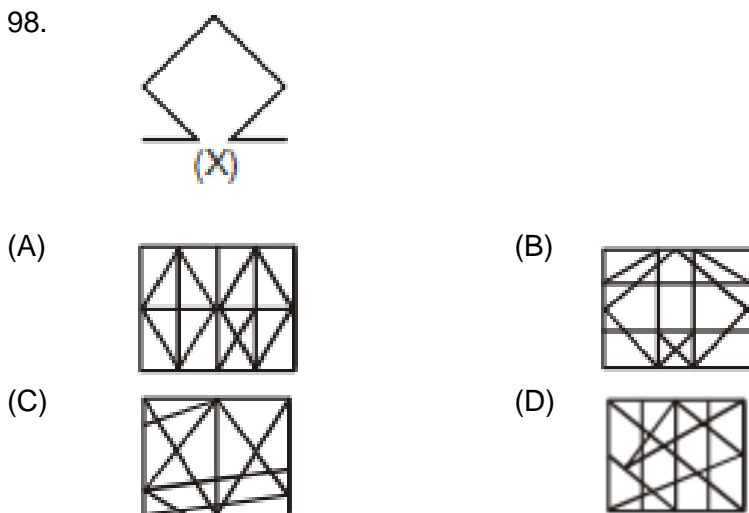
96. C

In the following question, choose the alternative figure in which the question figure (X) is embedded.




97. B

In the following question, choose the alternative figure in which the question figure (X) is embedded.



98. B

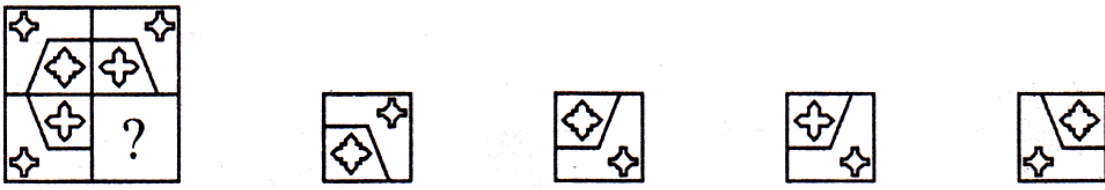
Directions (Questions 99 – 100) : In the following question, Select a figure form amongst the four alternatives, which when placed in the blank space of fig. (X) would complete the pattern.

99. 

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

99. **A**

In the following question, Select a figure form amongst the four alternatives, which when placed in the blank space of fig. (X) would complete the pattern.

100. 

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

100. **B**

ANSWER KEYS
SIMULATION TEST (DELHI)
for
NTSE STAGE – I
(All Class X Batches)

Mental Ability Test

QP CODE:

ANSWERS

1. D	2. A	3. C	4. C
5. B	6. D	7. C	8. D
9. D	10. B	11. A	12. B
13. A	14. D	15. B	16. A
17. B	18. C	19. D	20. B
21. B	22. C	23. A	24. C
25. D	26. D	27. A	28. A
29. C	30. A	31. B	32. A
33. C	34. B	35. D	36. B
37. A	38. A	39. B	40. C
41. B	42. B	43. B	44. C
45. D	46. B	47. D	48. C
49. C	50. D	51. B	52. A
53. D	54. A	55. D	56. B
57. A	58. C	59. C	60. B
61. A	62. D	63. C	64. C
65. B	66. A	67. B	68. C
69. B	70. D	71. B	72. B
73. D	74. B	75. C	76. B
77. D	78. B	79. A	80. A
81. C	82. C	83. C	84. C
85. B	86. A	87. B	88. C
89. D	90. B	91. C	92. A
93. B	94. D	95. D	96. C
97. B	98. B	99. A	100. B

HINTS AND SOLUTIONS

1. D

$$1. \quad 3x^3 + 2x^2 + 3x + 2 = x^2(3x + 2) + (3x + 2) = (3x + 2)(x^2 + 1)$$

2. A

$$2. \quad \text{Given exp.} = (2a)^2 + b^2 + 2^2 + 2 \times 2a \times b + 2 \times b + 2 \times b \times 2 + 2 \times 2a \times 2 \\ = (2a + b + 2)^2$$

3. C

3. For 9 kg zinc, mixture melted = (9 + 11) kg

$$\text{For 28.8 kg zinc, mixture melted} = \left(\frac{20}{9} \times 28.8\right) \text{ kg} = 64 \text{ kg}$$

4. C

4. Remainder = 46

$$\text{Divisor} = 5 \times 46 = 230$$

Also $10 \times \text{quotient} = 5 \times \text{remainder}$

$$\therefore \text{Remainder} = 2 \times \text{quotient i.e., quotient} = 23$$

$$\text{Dividend} = 23 \times 230 + 46 = 5336$$

5. B

$$5. \quad \text{Divisor} = 75 + 95 = 170$$

$$\text{Quotient} = 75$$

$$\text{Remainder} = 95$$

$$\therefore \text{Dividend} = 170 \times 75 + 95 = 12845$$

6. D

$$6. \quad 179 \times 2 + 179 \times 3 + 179 \times 4 + 179 \times 5$$

$$= 179 \times (2 + 3 + 4 + 5)$$

$$= 179 \times 14 = 2506$$

7. C

$$7. \quad \frac{1}{6 \times \frac{1}{8 \div \frac{1}{1 - \frac{7}{8}}}} + \frac{5}{6} = \frac{1}{6 \times \frac{1}{8 \div \frac{1}{\frac{1}{8}}}} + \frac{5}{6} \\ = \frac{1}{6 \times \frac{1}{8 \div 8}} + \frac{5}{6} \\ = \frac{1}{6 \times \frac{1}{1}} + \frac{5}{6} = \frac{1}{6} + \frac{5}{6} = 1$$

8. D

8. After taking out $\frac{1}{5}$ of its contents, the purse remains with $\frac{4}{5}$ of contents.

Let original content = x

Now, $\frac{1}{12}$ of $\frac{4}{5}x = \text{Rs } 7.40$ or, $\frac{x}{15} = \text{Rs } 7.40 \therefore x = \text{Rs. } 111$

9. D

9. $x + y = 27$ and $x^2 - y^2 = 351$

$\therefore x - y = 351 \div 27 = 13$

Now, $x + y = 27$ and $x - y = 13$

$\Rightarrow 2x = 40$ or $x = 20$ so, y is 7

Greater number is 20

10. B

10. When $p(x)$ is divided by $(x - a)$, we get:

Remainder = $p(a) = (a^3 - a^3 + a) = a$

11. A

11. Let b be the length of the side opposite angle B and c the length of the side opposite angle C and h the length of the hypotenuse.

$\sin(B) = b/h$ and $\cos(B) = c/h$

$\sin(B) = \cos(B)$ means $b/h = c/h$ which gives $c = b$

The two sides are equal in length means that the triangle is isosceles and angles B and C are equal in size of 45° .

12. B

12. $\frac{550 - 450}{450 - 75} = \frac{100}{375} = \frac{4}{15}$

13. A

13. $\frac{\pi R_1^2}{\pi R_2^2} = \frac{4}{9} \Rightarrow \frac{R_1^2}{R_2^2} = \frac{4}{9} \Leftrightarrow \frac{R_1}{R_2} = \frac{2}{3} \Leftrightarrow \frac{2\pi R_1}{2\pi R_2} = \frac{R_1}{R_2} = \frac{2}{3}$

\therefore Required ratio = 2:3

14. D

14. Let the original radius and height of the cone be r and h respectively

Then, original volume = $\frac{1}{3}\pi r^2 h$

New radius = $\frac{120}{100}r = \frac{6}{5}r$, New height = $\frac{6}{5}h$

New volume = $\frac{1}{3}\pi \times \left(\frac{6}{5}r\right)^2 \times \left(\frac{6}{5}h\right) = \frac{216}{125} \times \frac{1}{3}\pi r^2 h$

Increase in volume = $\frac{91}{125} \times \frac{1}{3}\pi r^2 h$

\therefore Increase % = $\left(\frac{\frac{91}{125} \times \frac{1}{3}\pi r^2 h}{\frac{1}{3}\pi r^2 h} \times 100 \right) \% = 72.8\%$

15. B

15. Let $\frac{a}{3} = \frac{b}{4} = \frac{c}{4} = k$. Then, $a = 3k$, $b = 4k$, $c = 7k$

$\therefore \frac{a+b+c}{c} = \frac{3k+4k+7k}{7k} = \frac{14k}{7k} = 2$

16. A
 16. SP = Rs. 5.2 per kg, Gain = 30% \Rightarrow CP = Rs 4 per kg
 \therefore required ratio = $\frac{4.6 - 4}{4 - 3.8} = \frac{0.6}{0.2} = \frac{3}{1}$
 $\Rightarrow \frac{3}{1} = \frac{x}{60}$
 $\therefore x = 180$ kg
17. B
 17. Mode = (3 median) – (2 mean)
 $\Rightarrow 2 \text{ mean} = (3 \text{ median}) - (\text{mode}) = (3 \times 26) - 29 = 49$
 $\Rightarrow \text{mean} = \frac{49}{2} = 24.5$
18. C
 18. (S.P of 12 notebooks) – (C.P of 12 notebooks) = S.P of 4 notebooks
 C.P of 12 notebooks = S.P of 8 notebooks
 Let C.P of each notebooks be Re 1
 Then, C.P of 8 notebooks = Rs 8, S.P of 8 notebooks = Rs 12
 $\therefore \text{Gain\%} = \left(\frac{4}{8} \times 100\right)\% = 50\%$
19. D
 19. The equation are $x - 2y - 3 = 0$ and $3x + ky - 1 = 0$
 These are of the form $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$, where
 $a_1 = 1, b_1 = -2, c_1 = -3$ and $a_2 = 3, b_2 = k, c_2 = -1$
 $\therefore \frac{a_1}{a_2} = \frac{1}{3}, \frac{b_1}{b_2} = \frac{-2}{k}$ and $\frac{c_1}{c_2} = \frac{-3}{-1} = 3$
 For a unique solution we must have: $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$
 $\therefore \frac{1}{3} \neq \frac{-2}{k} \Rightarrow k \neq -6$
20. B
 20. Given expression is $3^2 \cdot 3^x + \frac{1}{3^x} = 10$. Put $3^x = y$. Then,
 $9y + \frac{1}{y} = 10 \Rightarrow 9y^2 - 10y + 1 = 0$
 $\Rightarrow 9y^2 - 9y - y + 1 = 0 \Rightarrow (9y)(y - 1) - (y - 1) = 0$
 $\Rightarrow (y - 1)(9y - 1) = 0 \Rightarrow y = 1$ or $y = \frac{1}{9}$
 $\Rightarrow 3^x = 1 = 3^0$ and $3^x = \frac{1}{9} = \frac{1}{3^2} = 3^{-2}$
 $\Rightarrow x = 0$ or $x = -2$
 \therefore its roots are $-2, 0$
21. B

21. $A + C = 180$ and $B + D = 180$
 $\Rightarrow x + y + 10 + x + y - 30 = 180$ and $y + 20 + x + y = 180$
 $\Rightarrow x + y = 100 \dots(i)$ and $x + 2y = 160 \dots(ii)$
 On solving (i) and (ii), we get $y = 60$ and $x = 40$
 $\therefore \angle B = (60 + 20)^\circ = 80^\circ$

22. C

22. Outer dimensions will be as follows:
 Length = $86 + 4 = 90$ cm, Breadth = $46 + 4 = 50$ cm
 and Height $h = 38 + 2 = 40$ cm
 So, the area of outer surface = $l \times b + 2 \times l \times h + 2 \times b \times h$
 $= 4500 + 7200 + 4000$
 $= 15700 \text{ cm}^2 = 1.57 \text{ m}^2$
 So, the cost of painting $1.57 \times 10 = \text{Rs.}15.7$

23. A

23. 400 men can do $\frac{1}{4}$ work in 25 days
 x men will do $\frac{3}{4}$ work in 50 days
 More work implies more men
 More days implies less men
 $\therefore x = 400 \times \left(\frac{3}{4} \div \frac{1}{4}\right) \times \frac{25}{50} = 600$
 \therefore Extra men employed = $(600 - 400) = 200$

24. C

24. Given equation is $7x^2 - 12x + 18 = 0$
 $\therefore \alpha + \beta = \frac{12}{7}$ and $\alpha\beta = \frac{18}{7}$
 \therefore required ratio = $\frac{12}{7} : \frac{18}{7} = 12 : 18 = 2 : 3$

25. D

25. Option (A) $(60 \div 16) \times 14 = 70$
 $(60 \div 12) + 14 = 70$
 $5 + 14 = 70$ (this is wrong)
 Option (B) $(55 - 12) + 3 = 42$
 $(55 - 16) \times 3 = 42$
 $39 \times 3 = 42$ (this is wrong)
 Option (C) $(40 \times 8) - 12 = 36$
 $(40 + 8) - 16 = 36$
 $48 - 16 = 36$ (this is wrong)

26. D

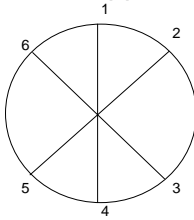
26. Percentage of alcohol in the vessel in the end
 $= \left(\frac{200 - 20}{200}\right)^3 \times 100\%$
 $= \frac{729}{1000} \times 100\%$
 $= 72.9\%$

27. A

27. In all other pairs, $\frac{(\text{1st number})^2}{2} = \text{2nd number}.$

28. A

28. Let us draw a circle with 6 chairs around it and place Srikanth and Sravan in to arbitrarily, selected opposite places –1 and 4



Pragathi and Vasan must be seated at 3 and 5 in any order.

⇒ 2 and 6 are taken by Keerthi and Kamal which implies that Srikanth is between those two.

29. C

29. Opposite faces can have the same colour. Since, there are six faces in a cube, the minimum number of colours required is 3.

30. B

30. Here, $\frac{n(n-1)}{2} = 120 \Rightarrow n^2 - n - 240 = 0$

$$\Rightarrow (n - 16)(n + 15) = 0$$

So, $n = 16$, where n is the number of people.

31. B

31. $(4 \times 1) + 1 = 5, (5 \times 2) + 2 = 12, (12 \times 3) + 3 = 39$

$(39 \times 4) + 4 = 160, (160 \times 5) + 5 = 805$

So, 815 is the wrong term

32. A

32.
$$\begin{array}{ccccccccc} & & +31 & & +37 & & +41 & & +43 & & +47 & & \\ & & | & & | & & | & & | & & | & & \\ 68 & & & & 99 & & 136 & & 177 & & 220 & & 267 \end{array}$$

The differences are consecutive prime numbers

So, 219 is wrong.

33. C

33. All the numbers are of the form $n^3 + n^2$, where $n = 1, 2, 3, \dots, 7$

But 160 is not of that form. It should be 150 ($5^3 + 5^2$)

34. B

34. Numbers are of the form $n^3 - 1$

But 125 is not of that form. It should be 124.

35. D

35.
$$\begin{array}{ccccccccc} & & \div 2 & & +8 & & \div 2 & & +8 & & \div 2 & & \\ & & | & & | & & | & & | & & | & & \\ 664 & & & & 332 & & 340 & & 170 & & 178 & & 89 \end{array}$$

36. B

36. $x \times \frac{15}{60} + 2x \times \frac{20}{60} + x \times \frac{10}{60} = 39 \Rightarrow \frac{x}{4} + \frac{2x}{3} + \frac{x}{6} = 39$
 $\Rightarrow 3x + 8x + 2x = 468 \Rightarrow x = 36.$

37. A

37. At 3 O' clock, minute hand is 15 min spaces behind the hour hand.

Case I: When the minute hand is 4 min spaces behind the hour hand.

In this case, minute hand has to gain $(15 - 4) = 11$ min spaces over hour hand.

\therefore 55 minute are gained in 60 min.

\therefore 11 min are gained in $\frac{60 \times 11}{55}$ min = 12 min

Hence, the hands will be 4 min apart at 12 min past 3.

Case II: When the minute hand is 4 min spaces ahead of the hour hand.

In this case, minute hand has to gain $(15 + 4) = 19$ min spaces over hour hand.

\therefore 55 min are gained in 60 min.

\therefore 19 min are gained in $\left(\frac{60}{55} \times 19\right)$ min = $\left(\frac{12 \times 19}{11}\right)$ min = $20\frac{8}{11}$ min

Hence, the hands will be 4 min apart at $20\frac{8}{11}$ min past 3.

38. A

38. Moving in anti – clockwise direction in each of the figures,
 We have

$$\frac{3 \times 4 \times 8}{2} = 48$$

And

$$\frac{9 \times 2 \times 18}{2} = 162$$

Similarly

$$\frac{4 \times 20 \times 15}{2} = 600$$

Hence, option A is correct.

39. B

39. $D = (-6)^2 - 4 \times 2 \times 3 = (36 - 24) = 12 > 0$ and not a perfect square

\therefore the roots are real unequal and irrational.

40. C

40. Let side = 4 unit

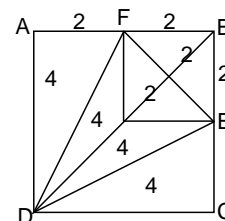
Area = 16 unit²

Shaded : Unshaded

$$(4 + 4 + 2) : (16 - 4 - 4 - 2)$$

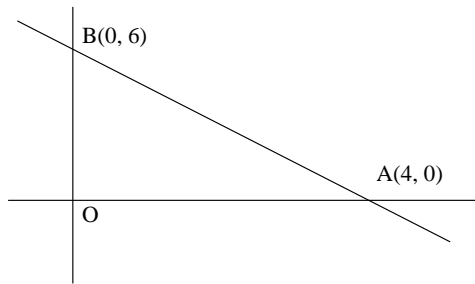
$$10 : 6$$

$$5 : 3$$



41. B

41. Clearly, OA = 4 units and OB = 6 units



$$\therefore \text{ar}(\triangle OAB) = \frac{1}{2} \times OA \times OB = \left(\frac{1}{2} \times 4 \times 6 \right) = 12 \text{ sq units.}$$

42. B

42. Time taken by one tap to fill half of the tank = 3 hrs.

$$\text{Part filled by the four taps in 1 hour} = 4 \times \frac{1}{6} = \frac{2}{3}.$$

$$\text{Remaining part} = 1 - \frac{2}{3} = \frac{1}{3}$$

$$\therefore \frac{2}{3} : \frac{1}{2} :: 1 : x$$

$$\Rightarrow x = \frac{3}{4} \text{ hours i.e. 45 minutes.}$$

So, the total time is 3 h 45 min.

43. B

43. Clearly, Rate = 5% pa, Time = 3 years, SI = Rs 1200

$$\text{So, principal} = \text{Rs.} \left(\frac{100 \times 1200}{3 \times 5} \right) = \text{Rs. } 8000$$

$$\text{Amount} = \text{Rs} \left[8000 \times \left(1 + \frac{5}{100} \right)^3 \right] = \text{Rs.} \left(8000 \times \frac{21}{20} \times \frac{21}{20} \times \frac{21}{20} \right) = \text{Rs. } 9261$$

$$\therefore \text{CI} = \text{Rs} (9261 - 8000) = \text{Rs } 1261$$

44. C

44. Let $p(x) = (x^{31} + 31)$ be divided by $(x + 1)$

$$\text{Then, remainder} = p(-1) = (-1)^{31} + 31 = (-1 + 31) = 30$$

45. D

$$45. \text{ We have } 40\% \text{ of } 50 = \left(\frac{40}{100} \times 50 \right) = 20$$

\therefore Required number = Number of students scoring less than 20 marks in aggregate

$$= 100 - \text{number of students scoring 20 and above marks in aggregate}$$

$$= 100 - 73 = 27$$

46. B

$$46. \text{ We have } 60\% \text{ of } 50 = \left(\frac{60}{100} \times 50 \right) = 30$$

\therefore Required number = Number of students scoring 30 and above marks in Physics = 32

47. D
47. Required difference = (Number of students scoring 30 and above marks in aggregate) – (Number of students scoring 30 and above marks in Chemistry) = 27 – 21 = 6
48. C
48. Number of students getting at least 60% marks in Chemistry = Number of students getting 30 and above marks in Chemistry = 21
 Number of students getting at least 40% marks in aggregate = Number of students getting 20 and above marks in aggregate = 73
 \therefore Required percentage = $\left(\frac{21}{73} \times 100\right)\% = 28.77\% = 29\%$
49. C
49. Since 66 students get 20 and above marks in Chemistry and out of these 21 students get 30 and above marks, therefore to select atleast 23 students in Chemistry, the qualifying marks should lie in the range 20-30.
50. D
50. Given: r = 6cm and h = 12 cm
 \therefore volume = $\frac{1}{3}\pi r^2 h = \left(\frac{1}{3} \times \pi \times 6 \times 6 \times 12\right) \text{cm}^3 = (144\pi) \text{cm}^3$
51. B
51. The given series is a mixed series.
 Pattern for the first letter.
 G - 4, C - 4, Y - 4, U - 4, Q
 Pattern for the second letter
 T + 5, Y + 5, D + 5, I + 5, N
 Pattern for the third letter:
 B - 6, V - 6, P - 6, J - 6, D
 Hence, the missing group is UIJ.
52. A
52. There is no such symbol.
53. D
53. The first and the third elements of each term move 2 steps forward while the second element moves one step backward to given the corresponding elements of the next term.
54. A
54. The next arrangement is:
 S Q 6 * K 2 R ζ C V 8 E # G 2 \$ 4 9 L N 3 U F 5 Y a B 7 W 9
 The 18th element from the left end is 9. The element 9 steps to the left of 9 is C.
55. D
55. In all other groups, the first and second elements each move 3 steps forward to given the second and third elements respectively.
56. B
56. From (i), (iii) and (iv), none of Niranjana, Veeru and Mahendar is from Kolkata.
 \therefore Sridhar is from Kolkata.
 From (ii), (iii) and (v) Sridhar has Renault.
 From (i), Niranjana has Mc. Laren.
 Hence Mahendar has Williams.

From (v) Veeru is from Hyderabad and hence Niranjan is from Bangalore
Niranjan is from Bangalore.

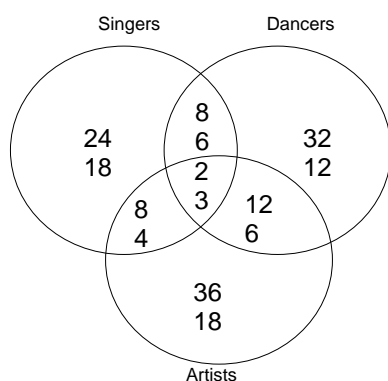
57. A
57. Niranjan, who is from Bangalore has Mc. Laren.

58. C
58. Mahendar has Williams.

59. C
59. Only choice C is true.

60. B
60. As, $(14 \times 4 - 20) \div 12 = 3$
 $(9 \times 9 - 42) \div 13 = 3$
and $(12 \times 8 - 19) \div 7 = 11$
Similarly, $(20 \times 10 - 40) \div 20 = 8$

61. A
61.



none $\begin{bmatrix} 0 \\ 0 \end{bmatrix}$

Number of females singers who are also dancers = $6 + 3 = 9$.

62. D
62. Number of dances who are artists = $(12 + 2) + (3 + 6) = 23$

63. C
63. Number of females who are not singers = $(12 + 6 + 18) = 36$

64. C
64. As, $(6 \times 8) + 3 = 51$
 $(15 \times 4) + 5 = 65$
Similarly, $(20 \times 5) + 20 = 120$

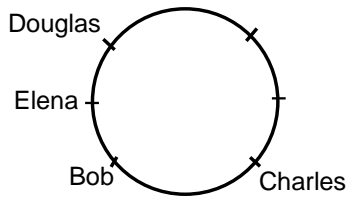
65. B
65. '9' stands for 'mine'.

66. A
66. '673' means 'a metal piece'.

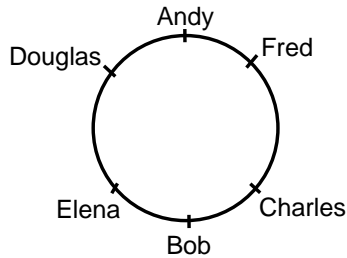
67. B
67. One clean the black board with a duster. In that language sharpener means duster.

68. C

68. As Bob is sitting between Charles and Elena and Douglas is sitting to the left of Elena. We get following arrangement.



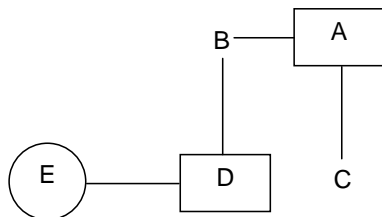
Andy is opposite Bob. Therefore, the final arrangement is as follows.



Charles is sitting opposite Douglas.

69. B
 69. Elena is sitting to the left of Bob.
70. D
 70. Elena sits to the right of Fred, if Elena interchanges her place with person opposite to Bob.
71. B
 71. $40 + 10 - 20 \div 10 \times 4 = 42 \neq 40$
 $10 + 8 \times 4 \div 8 - 9 = 5$
 $31 - 5 \div 3 \times 4 + 9 = \frac{100}{3} \neq 21$
 $40 + 30 \div 10 - 5 \times 7 = 8 \neq 10$
72. B
 72. In this coding, the code for the letters B, D, F, H, J, L, N, P, R, T, V, X and Z is 1.
 The code for the letters C, I, O and U is 2.
 The code for the letters A, E, G, K, M, Q, S, W and Y is 3.
 Hence, the code for ALPHABET is 31113131.

73. D
 73.



Here it is sure A is father of C. As we are not sure about C's gender we cannot determine relation of C with A.

74. B
 74. 'C' = 00, 14, 23, 32, 41
 'A' = 03, 12, 21, 30, 44

'R' = 57, 66, 75, 89, 98
'E' = 56, 65, 79, 88, 97

75. C

75. In option C,
 $19 \div 5 + 4 - 2 \times 4$
 $= 19 - 5 \times 4 \div 2 + 4$
 $= 13$, which is correct.

76. B

76. A cannot be opposite D, B, F or E as they are adjacent to A. Hence, A must be opposite C.

77. D

77. 1 figure square = 4
4 figure square = 5
7 figure square = 4
12 figure square = 1
16 figure square = 1
24 figure square = 1
28 figure square = 1
 \therefore total number of squares = 17

78. B

78. As per observation.

79. A

79. Grouping the figures on the basis of sides, we get
Figures made by three lines = 1, 3, 4
Figures made by four lines = 6, 7, 8
Figures made by five lines = 2, 5, 9

80. A

80. '7654321' means 'REVERSE'.

81. C

81. The two chances are

$$\begin{array}{r} 6271 \\ + 6271 \\ \hline 12542 \end{array} \quad \text{and} \quad \begin{array}{r} 6291 + \\ 6291 \\ \hline 12582 \end{array}$$

In both the cases
 $T + O = 1 + 2 = 3$

82. C

82. Yellow is adjacent to White, Red, Green and Pink, so Yellow cannot be adjacent to these colours. Hence, Yellow should be adjacent to Blue colour.

83. C

83. As per observation

84. C

84. In the figure there are 34 columns containing 2 cubes each.
 \therefore Total number of cubes = $(34 \times 2) = 68$

85. B

85. In the figure, there are 21 columns containing 2 cubes each and 4 columns containing 1 cube each.

\therefore Total number of cubes = $(21 \times 2) + (4 \times 1) = 42 + 4 = 46$

86. A

86. From the given two cubes, we can say
3 is opposite to 5
1 is opposite to 2
6 is opposite to 4
Hence option A.

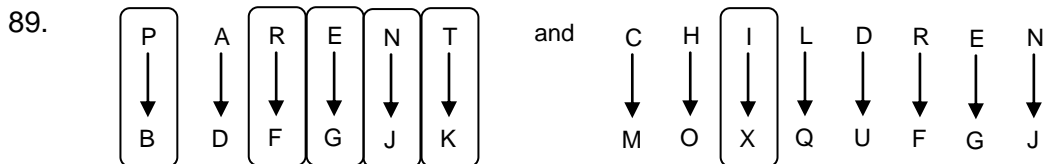
87. B

87. A cannot be opposite D, B, F or E as they are adjacent to A. Hence, A must be opposite C.

88. C

88. From first to second, arrow mark is going 90° anticlockwise, then 45° anticlockwise, then 90° again and 45° again and so on. And stick is rotating 45° clockwise, then 90° clockwise, then 45° again and 90° again and so on.

89. D



\therefore REPRINT \Rightarrow FGBFXJK

90. B

90. 1 figure triangles = 16
2 figure triangles = 4
 \therefore total number of triangles = 20

91. C

91. Each circle has 4 semi circles.
 $\therefore 12 \times 4 = 48$

92. A

92. Clearly, option (A) is the answer.

93. B

93. Clearly, option (B) is the answer.

94. D

94. Clearly, option (D) is the answer.

95. D

95. Clearly, option (D) is the answer.

96. C

96. As per observation

97. B

97. As per observation

98. B

98. As per observation

99. **A**
99. As per observation

100. **B**
100. As per observation