MENTAL ABILITY TEST

(Questions 1 — 15)

DIRECTION: Read the questions 1 — 15 carefully and give answers by filling the circle of the letter denoting your selected answer on the OMR Answer-Sheet.

[নির্দেশ ঃ 1 থেকে 15 পর্যন্ত প্রশ্নগুলি ভালোভাবে পড়ো, বিকল্প উত্তরগুলির মধ্য থেকে সঠিক উত্তরটি নির্বাচন করো এবং ও.এম.আর. উত্তরপত্রের নির্দিষ্ট বৃত্ত পূরণ করে তোমার উত্তর নির্দেশ করো।]

1. If the ratio of the roots of the equation $x^2 + px + q = 0$ be equal to the ratio of the roots of $x^2 + lx + m = 0$, then

(a) $p^2 m = q^2 l$

(b) $pm^2 = q^2 l$

(c) $p^2 l = q^2 m$

(d) $p^2 m = l^2 q$

2. ABCD is a square with side a unit with centres A, B, C and D four circles are drawn such that each circle touches externally two of the remaining three circles. The area enclosed by the square and exterior of the circles is

(a) $a^2(1 - \pi)$ sq. unit

(b) $a^2(\pi - 1)$ sq. unit

(c) $a^2 \left(\dfrac{4 - \pi}{4} \right)$ sq. unit

(d) $\dfrac{\pi a^2}{4}$ sq. unit

3. If $\tan\alpha \cdot \tan\beta = \tan 45°$, then the value of $\cos\alpha - \sin\beta$ is

(a) ≥ 1

(b) 1

(c) ≥ 0

(d) 0

4. A solid metal sphere of surface area S_1 is melted and recast into a number of smaller spheres. S_2 is the sum of the surface areas of all the smaller spheres, then

(a) $S_1 > S_2$

(b) $S_2 > S_1$

(c) $S_1 = S_2$

(d) $S_1 \cdot S_2 = 1$

5. The angles of elevation of the top of the tower from two points at distances a unit and b unit from the base and in the same straight line with it are complementary. The height of the tower is

(a) $(a + b)$ unit

(b) $\sqrt{ab}$ unit

(c) ab unit

(d) $a\sqrt{b}$ unit

6. Roots of the equation $3x^2 - px + 3 = 0$ will be real and unequal when

(a) $-6 < p < 6$

(b) $p < -6$ or $p > 6$

(c) $p = \pm 6$

(d) None of the above

7. A cricketer scored an average of 44 runs in 10 innings. He played one more innings and the average come down to 40 runs. His score in the 11th innings is

(a) 3

(b) 2

(c) 1

(d) 0

8 The length of a rectangle I increased by 60% .Byu what per cent would the width have To be decreased to maintain the same area?

(a) 60

(b) 75

(c) 120

(d) 37·5

9. Which of the following polygons is uniquely determined when all the sides are given?

(a) Quadrilateral

(b) Pentagon

(c) Rhombus

(d) Triangle

10. The tangent at a point P on a circle with centre O meets the diameter AB produced at Q. If $\angle AQP = 40°$, then the value of $\angle APO$ is

(a) 10°

(b) 15°

(c) 20°

(d) 25°

11. If $x = a(b - c)$, $y = b(c - a)$, $z = c(a - b)$, then $\left(\dfrac{x}{a}\right)^3 + \left(\dfrac{y}{b}\right)^3 + \left(\dfrac{z}{c}\right)^3$ is equal to

(a) $\dfrac{xyz}{abc}$

(b) $\dfrac{1}{3}\dfrac{xyz}{abc}$

(c) $3\dfrac{xyz}{abc}$

(d) $\dfrac{3(x+y+z)}{abc}$

12. The value of $\sqrt{(a-b)^2}+\sqrt{(b-a)^2}$ is

    (a) always zero

    (b) never zero

    (c) positive if and only if $a > b$

    (d) positive only if $a \neq b$

13. In a triangle $\triangle ABC$, DE $\parallel$ BC, if AD = 3 cm, DB = 5 cm and AE = 6 cm then AC will be

    (a) 12 cm

    (b) 16 cm

    (c) 14 cm

    (d) 10 cm

14. ₹ 1 and ₹ 5 coins are available as many required. Find the smallest payment which can not be made by these coins, if not more than 5 coins are allowed.

    (a) 12

    (b) 14

    (c) 18

    (d) 9

15. A line intersects two circles with same centre at the points P, R, S and Q in order, then

    (a) PR < SQ

    (b) PR > SQ

    (c) PR = SQ

    (d) PR $\perp$ SQ

(Questions 16 — 25)

DIRECTION: In each question 16 to 25 there are two words separated by ':' and other two separated from the first two by the symbol '::'. Find the relation between two sets of words and select one word from the right side of ':' which have the same relation as left set of words of '::'. Fill the circle of the letter denoting your selected answer on the OMR Answer-Sheet.

[নির্দেশ ঃ নীচের 16 থেকে 25 পর্যন্ত প্রশ্নগুলির প্রতিটি ক্ষেত্রে দুটি শব্দ ':' চিহ্ন দ্বারা সম্পর্কিত এবং অপর দুটি প্রথম দুটি শব্দ থেকে '::' চিহ্ন দ্বারা আলাদা করা আছে। '::' চিহ্নের বাঁদিকের শব্দদুটির সম্পর্ক অনুযায়ী ডানদিকের শব্দদুটির সম্পর্ক খুঁজে (?) চিহ্নিত স্থানে উপযুক্ত শব্দটি a, b, c, d তে দেওয়া শব্দগুলির থেকে একটি শব্দ নির্ণয় করে যেটি অনুরূপ সম্পর্কযুক্ত হবে তা শনাক্ত করে ও.এম.আর. উত্তরপত্রের নির্দিষ্ট বৃত্ত পূরণ করতে হবে]

16. Moon : Satellite :: Earth : ?

    (a) Sun

    (b) Planet

    (c) Solar system

    (d) Asteroid

17. Drama : Director :: Magazine : ?

    (a) Story

    (b) Editor

    (c) Author

    (d) Reader

18. Profit : Loss :: Success : ?

    (a) Failure

    (b) Achiever

    (c) Winner

    (d) Hoper

19. 111 : 10 :: 31 : ?

    (a) 5

    (b) 6

    (c) 4

    (d) 9

20. Dog : Bark :: Goat : ?

    (a) Bleat

    (b) Howl

    (c) Grunt

    (d) Bray

21. BE : AD :: PS : ?

    (a) LO

    (b) RO

    (c) OR

    (d) OT

22. Seismologist : Earthquakes :: Geologist : ?

    (a) Universe

    (b) Earth

    (c) Sun

    (d) Plants

23. Brick : Building :: Straw : ?

    (a) Hut

    (b) Product

    (c) Drink

    (d) Food

24. Octopus : Mollusca :: Spider : ?

    (a) Genus

    (b) Arthropoda

    (c) Porifera

    (d) Class

25. J. K. Rowling : Harry Potter :: ? : Sherlock Holmes

a)   A.C. Doyel
B)   E. A. Poe
c)   C Dickens
d)   W. Collins

(Questions 26 — 55)

DIRECTION: In questions 26 — 55, numbers are placed in figures on the basis of some rules. One place in the figure is indicated by the interrogation sign(?). Find out the correct alternative to replace the question mark and indicate your answer by filling the circle of the corresponding letter of alternatives in the OMR Answer-Sheet.

[নির্দেশ ঃ 26 থেকে 55 পর্যন্ত প্রশ্নগুলির ক্ষেত্রে কিছু সংখ্যা ও অক্ষর চিত্রের মধ্যে নির্দিষ্ট নিয়মে দেওয়া আছে। একটি শূন্যস্থানে (?) চিহ্ন দেওয়া আছে। নিয়মটি খুঁজে নীচের দেওয়া একাধিক উত্তরগুলির মধ্যে সঠিকটি শনাক্ত করে ও.এম.আর. উত্তরপত্রে বৃত্ত পূরণ করো।]

26.
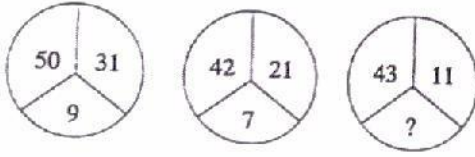
(a) 5

(b) 6

(c) 8

(d) 9

27.

(a) 91
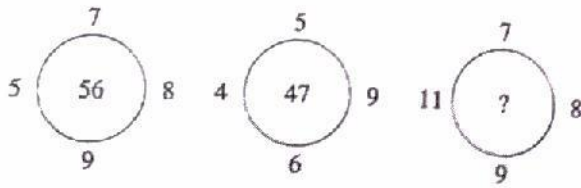
(b) 104

(c) 108

(d) 116

28.
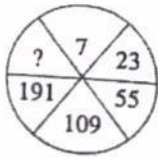
- (a) 307
- (b) 343
- (c) 300
- (d) 299

29.
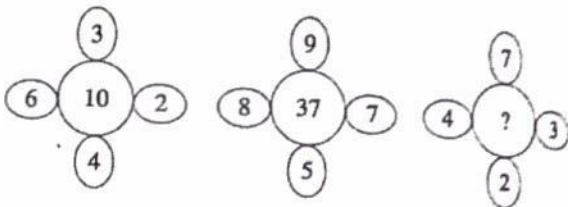
- (a) 20
- (b) 22
- (c) 21
- (d) 16

30.

8	4	9	5
5	7	3	4
3	4	5	8
39	44	?	72

- (a) 62
- (b) 60
- (c) 70
- (d) 72

31.

Z1	X16	V49
A4	C25	?
T9	R36	P81

(a) E10

(b) S15

(c) E64

(d) S12

32.
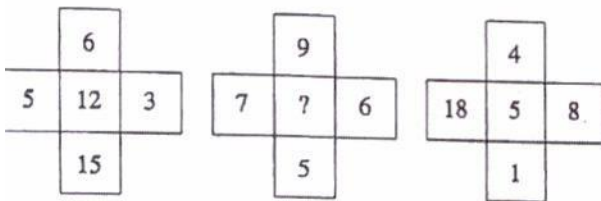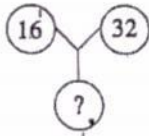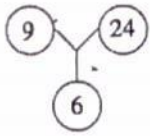

(a) 89

(b) 19

(c) 85

(d) 17

33.
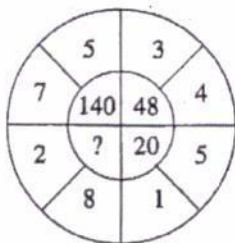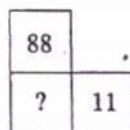

(a) 64

(b) 100

(c) 68

(d) 82

34.

- (a) 16
- (b) 8
- (c) 48
- (d) 10

35.
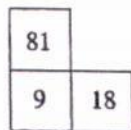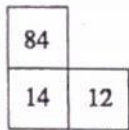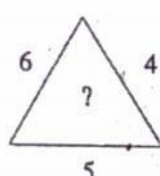
84	
14	12

81	
9	18

88	
?	11
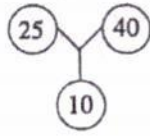
- (a) 16
- (b) 21
- (c) 81
- (d) 24

36.
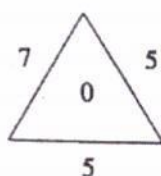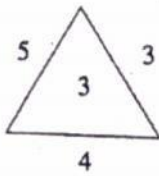
- (a) 29
- (b) 19
- (c) 15
- (d) 4

37.
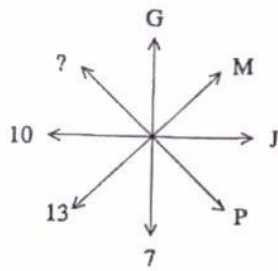
(a) 10
(b) 14
(c) 16
(d) 19

38.
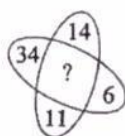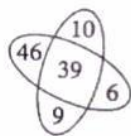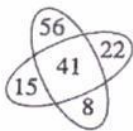
(a) 12
(b) 25
(c) 48
(d) 52

39.

(a) 0
(b) 8
(c) 125
(d) 216

40.

12 18 30
8...

| | | |

(top numbers: 12, 18, 30 → 6) (24, 32, 48 → 8) (48, 60, 84 → ?)

(a) 7
(b) 9
(c) 12
(d) 18

41.

Triangle 1: 3, 8, 4 with 48 inside
Triangle 2: 5, 7, 2 with ? inside
Triangle 3: 6, 5, 3 with 45 inside
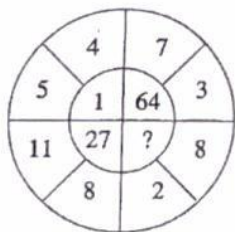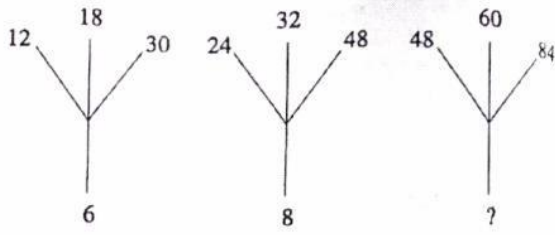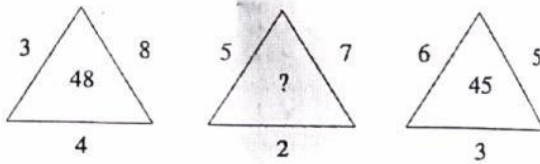
(a) 27
(b) 35
(c) 54
(d) 64

42.

3	2	2
6	20	3
12	25	64
6	10	?

(a) 6
(b) 8
(c) 10
(d) 12

43.

A	D	H
F	I	M
?	N	R

(a) K

(b) N

(c) O

(d) P

44.

A	M	B	N
R	C	S	D
E	U	F	?

(a) G

(b) R

(c) T

(d) V

45.

1	3	7
5	12	14
25	?	28
125	192	56

(a) 64

(b) 56

(c) 48

(d) 40

46.

1	7	9
2	14	?
3	105	117

(a) 26

(b) 20

(c) 16

(d) 12

47.

3	8	10	2	?	1
6	56	90	2	20	0

(a) 0

(b) 3

(c) 5

(d) 7

48.

	154	
14	221	196
	?	

(a) 11

(b) 13

(c) 15

(d) 17

49.
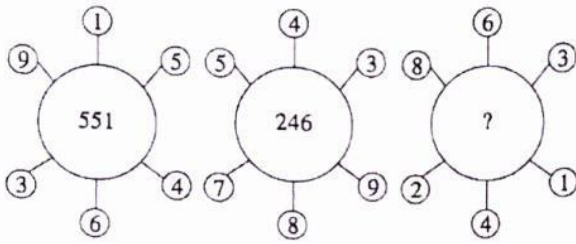
- (a) 262
- (b) 622
- (c) 631
- (d) 824

50.
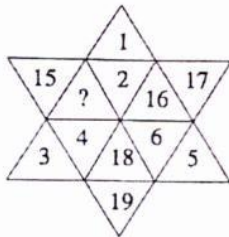
- (a) 13
- (b) 14
- (c) 20
- (d) 21

51.
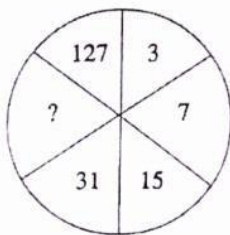
- (a) 61
- (b) 63
- (c) 65
- (d) 67

52.
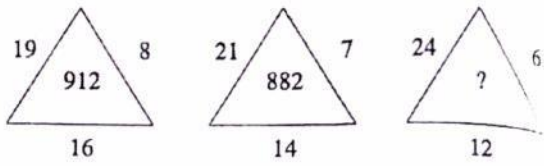
(a) 1234
(b) 936
(c) 864
(d) 756

53.
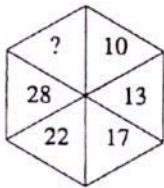
(a) 32
(b) 35
(c) 36
(d) 39

54.
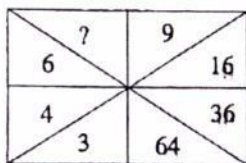
(a) 3
(b) 6
(c) 7
(d) 8

55.

4	8	20
9	3	15
6	6	?

(a) 16

(b) 18

(c) 20

(d) 24

(Questions 56 — 70)

DIRECTION: In each of the following questions 56 to 70 a number series is given with one term missing. Choose the correct alternative that will continue the same pattern and replace the question mark in the given series.

[নির্দেশ ঃ নীচের 56 থেকে 70 পর্যন্ত প্রতিটি প্রশ্নে একটি সংখ্যা শ্রেণি আছে। প্রতিটি শ্রেণিতে একটি করে লুপ্ত পদ আছে যেখানে '?' চিহ্ন বসানো আছে। ওই পদটি শ্রেণিটির নীচে চারটি বিকল্পের অন্যতম। ওই পদটি বার করে ও.এম.আর. উত্তরপত্রে সংশ্লিষ্ট বর্ণটির সাপেক্ষে বৃত্ত পূরণ করো]

56. 3, 7, 15, ?, 63, 127

    (a) 30

    (b) 31

    (c) 47

    (d) 52

57. 0, 2, 3, 5, 8, 10, 15, 17, 24, 26, ?

    (a) 28

    (b) 30

    (c) 32

    (d) 35

58. 10, 14, 26, 42, 70, ?

    (a) 100

    (b) 102

    (c) 106

    (d) 114

59. 0, 2, 8, 14, ?, 34

    (a) 20

    (b) 23

    (c) 24

    (d) 25

60. 563, 647, 479, 815, ?

    (a) 672

    (b) 386

    (c) 279

    (d) 143

61. $\dfrac{2}{\sqrt{5}}, \dfrac{3}{5}, \dfrac{4}{5\sqrt{5}}, \dfrac{5}{25}, ?$

    (a) $\dfrac{6}{5\sqrt{5}}$

    (b) $\dfrac{6}{25\sqrt{5}}$

    (c) $\dfrac{6}{125}$

    (d) $\dfrac{7}{25}$

62. 2, 9, 28, ?, 126, 217, 344

    (a) 50

    (b) 65

    (c) 70

    (d) 82

63. 90, 180, 12, 50, 100, 200, ?, 3, 50, 4, 25, 2, 6, 30, 3

    (a) 150

    (b) 175

    (c) 225

    (d) 250

64. 45, 54, 47, ?, 49, 56, 51, 57, 53

   (a) 48

   (b) 50

   (c) 55

   (d) None of the above

65. How many terms are there in the series 201, 208, 215, ..., 369?

   (a) 23

   (b) 24

   (c) 25

   (d) 26

66. 4,6,12,14,28,30, ?

   a) 32
   b) 60
   c) 62
   d) 64

67. 2, 2, 5, 13, 28, ?

   (a) 49

   (b) 50

   (c) 51

   (d) 52

68. 66, 36, 18, ?

   (a) 3

   (b) 6

   (c) 8

   (d) 9

69. 5, 2, 7, 9, 16, 25, ?

    (a) 41

    (b) 45

    (c) 48

    (d) 52

70. In the series 3, 9, 15, ..., what will be the 21st term?

    (a) 117

    (b) 121

    (c) 123

    (d) 129

(Questions 71 — 80)

DIRECTION: In each of the questions 71 to 80 there are four items, three of which are alike by some means or other while one is out of the class. Find out the odd item and indicate your answer by filling the circle of the corresponding letter on the OMR answer sheet.

[নির্দেশ ঃ 71 থেকে 80 পর্যন্ত প্রত্যেক প্রশ্নে চারটি করে পদ আছে। যাদের তিনটি কোনো না কোনো ভাবে একরকম এবং বাকিটা আলাদা। এই আলাদা পদটিকে নির্বাচন করে ও.এম.আর. উত্তরপত্রের নির্দিষ্ট বৃত্ত পূরণ করতে হবে।]

71. (a) Oxygen

    (b) Hydrogen

    (c) Carbon dioxide

    (d) Hydrogen peroxide

72. (a) Poland

    (b) Spain

    (c) Korea

    (d) Greece

73. (a) AFK

    (b) DIN

    (c) QSU

    (d) LQV

74. (a) 4 – 48

    (b) 7 – 147

    (c) 11 – 362

    (d) 5 – 75

75. (a) Carrot

    (b) Potato

    (c) Tomato

    (d) Ginger

76. (a) Lakshadeep

    (b) Manipur

    (c) Maharashtra

    (d) Haryana

77. (a) Sambhar

    (b) Siachen

    (c) Dal

    (d) Baikal

    .

78. (a) Yuri Gagarin

    (b) Rakesh Sharma

    (c) Neil Armstrong

    (d) Edmund Hillary

79. (a) Autocracy

    (b) Bureaucracy

    (c) Democracy

    (d) Diplomacy

80. (a) Birbal

   (b) Abul Fazal

   (c) Tansen

   (d) Faiz Ahmed

(Questions 81 — 83)

DIRECTION: Choose correct one:

[নির্দেশ ঃ সঠিক উত্তরটি নির্বাচন করো]

81. Mahesh walks 20 meters towards North. He then turns left and walks 40 meters. He again turns left and walks 20 metres. Further he moves 20 metres after turning to the right. How far is he from his original position?

   (a) 20 m

   (b) 30 m

   (c) 50 m

   (d) 60 m

82. One morning after sunrise, Reeta and Kavita were talking to each other face to face at Broad Square. If Kavita's shadow was exactly to the right of Reeta, which direction Kavita was facing?

   (a) North

   (b) South

   (c) East

   (d) None of the above

83. A watch reads 9·00 O'clock and I found that the hour hand is pointing south-east. In what direction, the minute hand of my watch is at that time?

   (a) East

   (b) South-West

   (c) North

   (d) North-East

(Questions 84 & 85)

DIRECTION: Choose correct one:

[নির্দেশ ঃ সঠিক উত্তরটি নির্বাচন করো]

84. Arrange the given words in the sequence in which they occur in the dictionary and then choose the correct sequence.

1. Credential
2. Creed
3. Crease
4. Cremate
5. Credible

(a) 1, 2, 3, 4, 5

(b) 1, 5, 3, 4, 2

(c) 5, 1, 2, 3, 4

(d) 3, 1, 5, 2, 4

85. Find which one word cannot be made from the letters of the given word:

INTERNATIONAL

(a) ORIENTAL

(b) TERMINAL

(c) LATTER

(d) RATIONAL

(Questions 86 — 90)

86. If 'x' means '÷', '–' means 'x', '÷' means '+' and '+' means '–', then $(3 - 15 \div 19) \times 8+6 = ?$

(a) 8

(b) 4

(c) 2

(d) – 1

87. If 'L' denotes '÷' 'M' denotes '×', 'P' denotes '+' and 'Q' denotes '−', then which of the following statement is true?

(a) $32P8L16Q4 = -\dfrac{3}{2}$

(b) $6M18Q26L13P7 = \dfrac{173}{13}$

(c) $11M34L17Q8L3 = \dfrac{38}{3}$

(d) $9P9L9Q9M9 = -71$

88. In the following question if the interchanges are made in signs and numbers, which one of the four equations would be correct? Given interchanges : signs '−' and '×' and numbers 3 and 6

(a) $6 - 3 \times 2 = 9$

(b) $3 - 6 \times 8 = 10$

(c) $6 \times 3 - 4 = 15$

(d) $3 \times 6 - 4 = 33$

89. If $9 * 7 = 58$ and $3 * 11 = 124$, what is the value of $13 * 5$?

      (a) 38

      (b) 31

      (c) 174

      (d) 36

90. If '×' stands for 'addition', '<' stands for 'subtraction', '+' stands for 'division', '>' stands for 'multiplication', '−' stands for 'equal to', and '=' stands for 'less than', state which of the following is true?

      (a) $3 \times 2 < 4 \div 16 > 2 + 4$

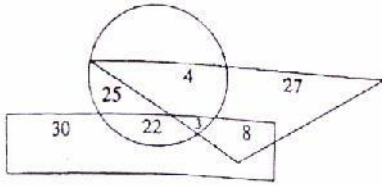   (b) $5 > 2 + 2 = 10 < 4 \times 8$

      (c) $3 \times 4 > 2 - 9 + 3 < 3$

      (d) $5 \times 3 < 7 \div 8 + 4 \times 1$

(Questions 91 — 95)

DIRECTION: Study the following figure carefully and answer the questions given below it. The rectangle represents artists, the circle represents players and the triangle represents doctors.

[নির্দেশ ঃ নিম্নের জ্যামিতিক আকারগুলি দেখো এবং নীচের প্রশ্নগুলির উত্তর দাও। আয়তাকার শিল্পী নির্দেশ করছে, বৃত্ত খেলোয়াড় নির্দেশ করছে এবং ত্রিভুজ ডাক্তার বোঝাচ্ছে।]

91. How many players are neither artists nor doctors?

    (a) 3

    (b) 8

    (c) 22

    (d) 25

92. How many artists are players?

    (a) 30

    (b) 29

    (c) 25

    (d) 22

93. How many doctors are both players and artists?

    (a) 3

    (b) 4

    (c) 8

    (d) 11

94. How many doctors are neither players nor artists?

    (a) 30

    (b) 27

    (c) 22

    (d) 8

95. How many artists are neither players nor doctors?

    (a) 22

    (b) 24

    (c) 29

    (d) 30

(Questions 96 & 97)

DIRECTION: Choose correct one:

[নির্দেশ ঃ সঠিক উত্তরটি নির্বাচন করো]

96. A + B means 'A is the brother of B'; A – B means 'A is the mother of B' and A × B means 'A is the sister of B'. Which of the following means 'A is the maternal uncle of B'?

    (a) A + C + B

    (b) A – B + C

    (c) A + C – B

    (d) A + C × B

97. Pointing out to a photograph a man tells his friend "she is the daughter of the only son of my father's wife." How is the girl related to the man in the photograph?

    (a) Daughter

    (b) Cousin

    (c) Mother

    (d) Sister

DIRECTION (98 — 100): A is the son of B. C, who is the sister of B has a son D and a daughter E. F is the maternal uncle of D.

98. How is A related to D?

    (a) Cousin

    (b) Nephew

    (c) Uncle

    (d) Brother

99. How is E related to F?
   (a) Sister
   (b) Daughter
   (c) Niece
   (d) Wife

100. How many nephews does have?
   (a) None
   (b) Two
   (c) One
   (d) Three