

FIITJEE

MUKHYAMANTRI VIGYAN PRATIBHA PARIKSHA PART – I

MENTAL ABILITY TEST (MAT)

Held on: January 22, 2023

QUESTION PAPER

- $\frac{1}{4}$ of a tank holds 135 Litres of water. What part of the tank is full if it contain 180 Litres of water?
 - $\frac{1}{6}$
 - $\frac{1}{3}$
 - $\frac{2}{3}$
 - $\frac{2}{5}$
- The least number, which when increased by 5 is divisible by each one of 24, 32, 36 and 54 is:
 - 427
 - 859
 - 869
 - 4320
- The value of $\frac{(0.96)^3 - (0.1)^3}{(0.96)^2 + 0.096 + (0.1)^2}$ is:
 - 0.86
 - 0.95
 - 0.97
 - 1.06
- If three numbers are added in pairs, the sums equal 10, 19 and 21. Find the numbers.
 - 6, 4, 15
 - 2, 8, 6
 - 6, 8, 14
 - 10, 12, 16
- If $5^a = 3125$, then the value of $5^{(a-3)}$ is:
 - 25
 - 125
 - 625
 - 1625
- If $\frac{3}{5}$ of a cistern is filled in 1 minute, how much more time will be required to fill the rest of it?
 - 30 sec
 - 40 sec
 - 36 sec
 - 24 sec
- If 7 spiders make 7 webs in 7 days, then 1 spider will make 1 web in how many days?
 - 1
 - $\frac{7}{2}$
 - 7
 - 49
- Same persons can do a piece of work in 12 days. Two times the number of such persons will do half of that work in:
 - 6 days
 - 4 days
 - 3 days
 - 12 days

9. If the ratio of areas of two squares is 225 : 256, then the ratio of their perimeters is:
 1. 225 : 256
 2. 256 : 225
 3. 15 : 16
 4. 16 : 15
10. Water flows into a tank 200m × 150m through a rectangular pipe 1.5m × 1.25m @ 20 kmph. In what time (minutes) will the water rise by 2 metre?
 1. 96 min.
 2. 92 min.
 3. 72 min.
 4. 88 min.
11. How many cubes of 3 cm edge can be cut out of a cube of 18 cm edge?
 1. 36
 2. 216
 3. 218
 4. 432
12. The surface area of cube is 600 cm². The length of its diagonal is:
 1. $\frac{10}{\sqrt{3}}$ cm
 2. $\frac{10}{\sqrt{2}}$ cm
 3. $10\sqrt{2}$ cm
 4. $10\sqrt{3}$ cm

Direction: (Q13 – Q.17): The following table gives the sales of batteries manufactured by company over the years. Study the table and answer the question that follows: Number of different types of batteries sold by a company over the years (numbers in thousands)

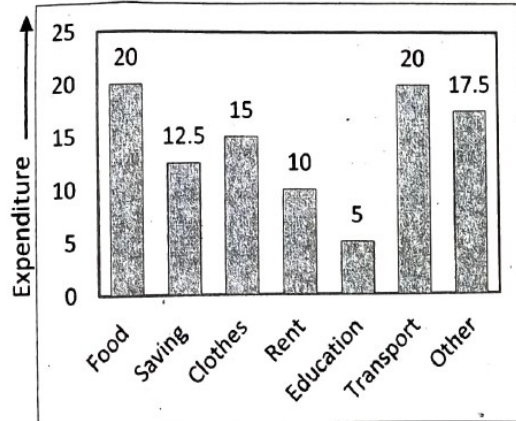
Year	Type of Batteries					Total
	4AH	7AH	32AH	35AH	55AH	
1992	75	144	114	102	108	543
1993	90	126	102	84	126	528
1994	96	114	75	105	135	525
1995	105	90	150	90	75	510
1996	90	75	135	75	90	465
1997	105	60	165	45	120	495
1998	115	85	160	100	145	605

13. The total sales of all the seven years are the maximum for which battery.
 1. 4AH
 2. 7AH
 3. 32AH
 4. 35AH
14. What is the difference in the number of 35AH batteries sold in 1993 and 1997.
 1. 24000
 2. 28000
 3. 35000
 4. 39000
15. The percentage of 4AH batteries sold to the total number of batteries sold was maximum in the year?
 1. 1994
 2. 1995
 3. 1996
 4. 1998
16. What was the approximate percentage increase in the sales of 55AH batteries in 1998 compared to that in 1992.
 1. 28%
 2. 31%
 3. 33%
 4. 34%
17. In the case of which battery there was a continuous decrease in sales from 1992 to 1997?
 1. 4AH
 2. 7AH
 3. 32AH
 4. 35AH

18. $\frac{1}{4} + \frac{[(20.35)^2 - (8.35)^2] \times 0.0175}{(1.05)^2 + (1.05)(27.65)}$. The value of equation is:
- | | |
|-------------------|--------------------|
| 1. $\frac{8}{20}$ | 2. $\frac{7}{20}$ |
| 3. $\frac{9}{20}$ | 4. $\frac{11}{22}$ |
19. What is the angle between minute and hour needle at 5:45.
- | | |
|----------------|-----------------|
| 1. 92° | 2. 95° |
| 3. 120° | 4. 97.5° |
20. Find the single discount equivalent to a series discount of 20%, 10% and 5%.
- | | |
|----------|----------|
| 1. 25.6% | 2. 31.6% |
| 3. 35% | 4. 32% |
21. If $2A = 3B = 4C$ then $A : B : C$ is:
- | | |
|--------------|----------------|
| 1. 2 : 3 : 4 | 2. 4 : 3 : 2 |
| 3. 6 : 4 : 3 | 4. 20 : 15 : 2 |
22. Two number differ by 5 if their product is 336. Then the sum of two number is:
- | | |
|-------|-------|
| 1. 21 | 2. 28 |
| 3. 37 | 4. 51 |
23. Ten years ago, A was half of B in age. If the ratio of their present ages is 3 : 4. What will be the total of their present age?
- | | |
|----------|----------|
| 1. 20 yr | 2. 30 yr |
| 3. 45 yr | 4. 35 yr |
24. If MORE is written as NLPNSQFD then TREE will be written as:
- | | |
|-------------|-------------|
| 1. USSQDFDF | 2. USQSDFDF |
| 3. USSQDFFD | 4. USSQDFDF |
25. If $-$ means \div , $+$ means \times , \div means $-$ and \times means $+$ then which of the following equation is correct?
- | | |
|--|---------------------------------------|
| 1. $52 \div 4 + 5 \times 8 - 2 = 36$ | 2. $43 \times 7 \div 5 + 4 - 8 = 25$ |
| 3. $34 \times 4 - 12 + 5 \div 3 = 420$ | 4. $36 - 12 \times 6 \div 3 + 4 = 60$ |
26. $\sqrt{6 + \sqrt{6 + \sqrt{6 + \dots}}} = ?$
- | | |
|--------|--------|
| 1. 2.3 | 2. 3 |
| 3. 6 | 4. 6.3 |
27. Find the value of
- $$2\frac{1}{3} - 1\frac{2}{11}$$
-
- $$3 + \frac{1}{3 + \frac{1}{3 + \frac{1}{3 + \frac{1}{3}}}}$$
- | | |
|---------------------|----------------------|
| 1. $\frac{38}{109}$ | 2. $\frac{109}{38}$ |
| 3. 1 | 4. $\frac{116}{109}$ |

28. If $\alpha^{\frac{1}{3}} = 11$ then $a^2 - 331a = ?$
- | | |
|------------|------------|
| 1. 1331331 | 2. 1331000 |
| 3. 1334331 | 4. 1330030 |

Direction (Q.29 – Q.33): Following Bar graph represent the expenditure of a family income in percentage.



29. The percentage expenditure on food:
- | | |
|---------|-------|
| 1. 5 | 2. 10 |
| 3. 12.5 | 4. 20 |
30. If family income in 1993 is 1,00,000 then the ratio of expenditure on saving to transport is:
- | | |
|----------|----------|
| 1. 7 : 5 | 2. 2 : 5 |
| 3. 5 : 8 | 4. 5 : 7 |
31. If expenditure on education is 12,500, then expenditure on other is:
- | | |
|----------|----------|
| 1. 47350 | 2. 43750 |
| 3. 17500 | 4. 15700 |
32. The difference of expenditure on food and saving is 7500 then expenditure on rent is:
- | | |
|-----------|-----------|
| 1. 5,000 | 2. 10,000 |
| 3. 15,000 | 4. 20,000 |
33. The amount of expenditure on clothes is how much more than the expenditure on savings in percentage.
- | | |
|---------|---------|
| 1. 12.5 | 2. 2.5 |
| 3. 10 | 4. 22.5 |

Direction (Q. No. 34 – 35): A farmer has 945 Goats and 2475 hens. He farms them into flocks keeping Goats and hens separately and having the same number of animals in each flock. If these flocks are as large as possible then.

34. What will be the maximum number of animals in each flock?
- | | |
|-------|-------|
| 1. 15 | 2. 9 |
| 3. 45 | 4. 46 |
35. What will be the total number of flocks required for the purpose?
- | | |
|--------|--------|
| 1. 76 | 2. 75 |
| 3. 380 | 4. 228 |

36. The traffic lights at 3 different road crossings change after 24 seconds, 36 seconds and 54 seconds respectively. If they all change simultaneously at 10 : 15 : 00 AM then at what time will they again change simultaneously.
1. 10 : 16 : 54 AM
 2. 10 : 18 : 36 AM
 3. 10 : 17 : 02 AM
 4. 10 : 22 : 12 AM
37. A money lender borrows money at 6% per annum simple interest and plays the interest at the end of the year. He lends it at 8% per annum compound interest, compounded half yearly and receives the interest at the end of the year. In this way, he gains 140.40 a year. The amount of money is borrows is :
1. 6000
 2. 6500
 3. 5000
 4. 4500
38. A boy aged 12 years was left with 1,00,000 which is under a trust. The trustee invest the money at 6% per annum and pay the minor boy a sum of 2500 for his pocket money at the end of each year. The expenses of trust came out to be 500 per annum find the amount that will be handed over to the minor boy after he attains the age of 18 years.
1. 1,20,000
 2. 1,36,000
 3. 1,25,000
 4. 1,18,000
39. A train traveling at 48 km/h crosses another train, having half its length and travelling in the opposite direction at 42 km/h in 12 seconds. It also passes a railway platform in 45 seconds. The length of the railway platform is:
1. 200m
 2. 300m
 3. 350m
 4. 400m
40. A thief is stopped by a policeman from a distance of 400 m. When the policeman starts the chase; the thief also starts running. The speed of the thief is 5 km/h and that of policeman is 9 km/h. How far the thief would have run, before he is over taken by the policeman?
1. 400 metre
 2. 600 metre
 3. 500 metre
 4. 300 metre
41. If $4r = h + \sqrt{r^2 + h^2}$ then $r : h$ is : $r \neq 0$
1. 17 : 8
 2. 8 : 17
 3. 8 : 15
 4. 15 : 8
42. If $x + \frac{1}{x} = \sqrt{3}$ the value of $x^{18} + x^{12} + x^6 + 1 = ?$
1. 0
 2. 1
 3. 2
 4. 3

Direction (Q. No. 43 – 44): Study the following information and answers the questions given below:

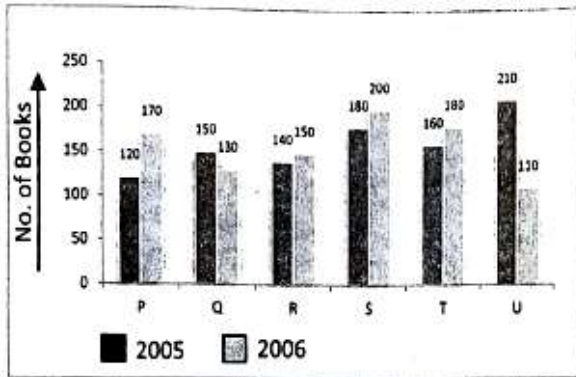
Point P is 4m west of point H.
 Point L is 3m north of point P.
 Point M is 4m east of point L.
 Point R is 5m north of point M.
 Point V is 8m east of point R.
 Point T is 8m south of point V
 Point D is 4m west of point T.
 Point G is 6m north of point D

43. How far and in which direction point H is with respect to point D?
1. 4m , East
 2. 4m, West
 3. 3m, East
 4. 3m, West

44. Point R is in which direction with respect to point T?
 1. North-East
 2. South-East
 3. South-West
 4. North-West
45. A tank has two pipes. The first pipe can fill it in 3 hours and the second can empty it in 12 hours. If two pipes be opened together at a time, then the tank will be filled in:
 1. $5\frac{1}{6}$ hours
 2. 4 hours
 3. 6 hours
 4. $5\frac{1}{3}$ hours

Direction (Q. No. 46 – 50): Study the following information and answer the given questions:

The following bar graph shows the total number of books read by 6 different person – P, Q, R, S, T & U in the year 2005 and 2006.

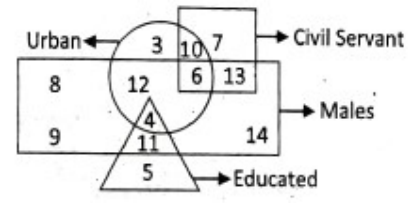


46. Find the ratio between the total number of book ready by P, Q and R together in year 2005 to that of total number of books read by S, T and U in the year of 2006.
 1. 13:17
 2. 41:49
 3. 25:32
 4. 67:73
47. Find the average number of books read by all the given persons in the year 2005.
 1. 155
 2. 165
 3. 170
 4. 160
48. Total number of books read by person Q and S together in the year 2005 is what percentage of total number of books read by person R and T together in the year 2006?
 1. 90%
 2. 100%
 3. 97%
 4. 80%
49. Find the difference between the total number of books read by the person P and T together in the year 2005 to that of total number of books read by the person Q and S together in the year 2006.
 1. 70
 2. 50
 3. 60
 4. 80
50. If the total number of books read by the person A in the year 2005 is 20% more than the total number of books read by the person Q in the same year and that of books read by the person A in 2006 is same as that total books read by the person 'S' in the same year, then find the total number of books read by the person A in the both year together.
 1. 380
 2. 400
 3. 320
 4. 395

Direction (Q. No. 51 – 54): In the following questions, select the correct option from the given option for completing the given series.

51. 2, 6, 14, 30, 62, ?
 1. 126
 2. 128
 3. 120
 4. 130
52. 1, 2, 3, 2, 3, 5, 4, 5, ?
 1. 6
 2. 9
 3. 10
 4. 7
53. A, D, C, G, E, ?
 1. G
 2. J
 3. I
 4. L
54. 4, 9, 19, 34, 54, ? , 109
 1. 89.
 2. 84
 3. 74
 4. 79
55. If '÷' means '+', '-' means '÷', '×' means '-' and '+' means '×', then
 $32 \div 82 - 4 \times 12 + 4 = ?$
 1. 12
 2. $\frac{1}{12}$
 3. 40
 4. None of these

Direction (Q. No. 56 to 60): The following questions are based on the diagram given below



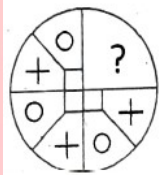
56. Who among the following is an educated male but who is not an urban resident?
 1. 4
 2. 5
 3. 9
 4. 11
57. Who among the following is neither a civil servant nor educated but is urban and not a male?
 1. 2
 2. 3
 3. 6
 4. 10
58. Who among the following is a male civil servant, who is neither educated nor belongs to urban area?
 1. 7
 2. 13
 3. 4
 4. 11
59. Who among the following is a female, urban resident and also a civil servant?
 1. 6
 2. 7
 3. 10
 4. 13
60. Who among the following is a male, urban oriented and also a civil servant but not educated?
 1. 13
 2. 12
 3. 6
 4. 10

Directions (Q. 61 - 62): In given questions two words are given which are related to each other, you have to find the word from given alternatives which bears exactly same relationship to third word as the first two bear.

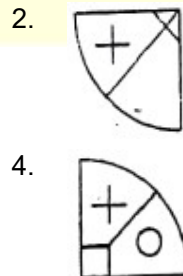
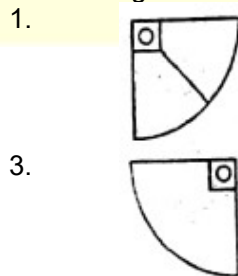
61. A 'square' is related to 'cube' in the same way as a 'circle' is related to
1. Sphere
2. Circumference
3. Diameter
4. Area
62. 'Radish' is related to 'Root' in the same way as 'Rose' is related to
1. Garden
2. Fragrance
3. Thorn
4. Flower
63. In a certain code language, 'SYSTEM' is written as 'SYSMET', 'NEARER' is written as 'AENRER', then how will 'FRACTION' be written in that language.
1. CARFNOIT
2. CARFTION
3. ARFCNOIT
4. FRACNOIT
64. If in a certain language MECHANICS is coded as HCEMSCIN, how is POSTER coded in that code?
1. OPTSRE
2. SPORET
3. RETSOP
4. TERPOS

Directions (Q. 65 - 67): In the following questions, a part of question figure is missing. Find out the figure that replace the '?' to complete the question figure.

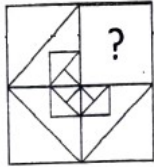
65. Question Figure



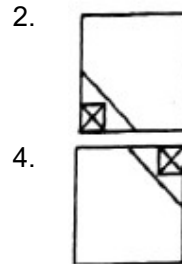
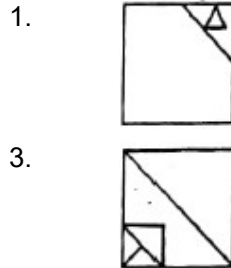
Answer Figure



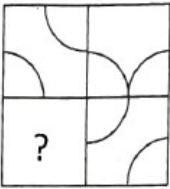
66. **Question Figure**



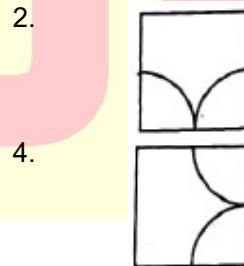
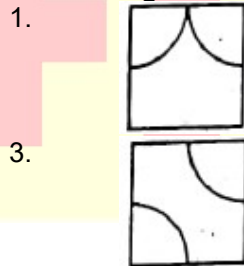
Answer Figure



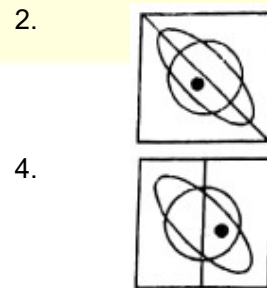
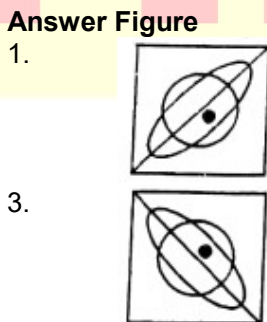
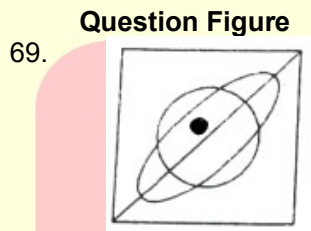
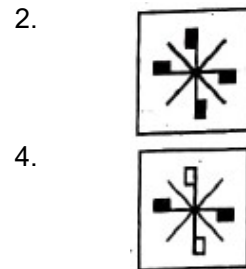
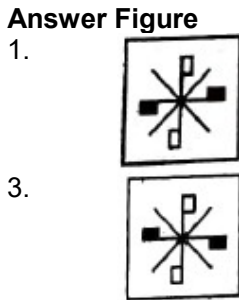
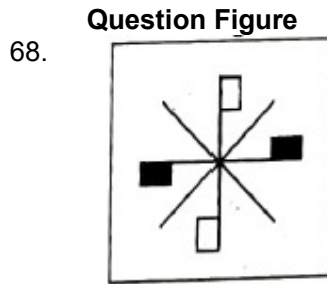
67. **Question Figure**



Answer Figure



Directions (Q. 68 – 69): Which of the four alternatives given below is the correct 'Water image' of the question figure?



70. If 3rd December 1999 is Sunday what day is 3rd January 2000.
1. Tuesday
 2. Wednesday
 3. Thursday
 4. Friday

Directions (Q. 71 – 75): A, B, C, D, E and F are members of a family. There are two married couples. B is an engineer and is father of E, F is grandfather of C and is a lawyer. D is grandmother of E and is a house wife. There is one engineer, one lawyer, one teacher, one house wife and two students in the family.

71. Which of the following are two married couple?
1. FD, BE
 2. FD, BA
 3. ED, CF
 4. FD, CA

72. Who is the husband of A?
 1. C
 3. B
 2. F
 4. D
73. Who is the sister of E?
 1. C
 3. D
 2. F
 4. Data inadequate
74. Which of the following can be 'A's profession?
 1. Teacher
 3. Engineer
 2. Housewife
 4. Engineer or Teacher
75. Which of the following is definitely a group of male members?
 1. BF
 3. BFA
 2. BFE
 4. FE

Directions (Q. 76 – 80): In the question given below one term is missing. Based on the relationship of the two given words, find the missing term from the given options.

76. BCF : DEF :: MNQ : ?
 1. OPR
 3. ORT
 2. PQS
 4. QTR

77. SUW : RST :: DFH : ?
 1. DEF
 3. CDE
 2. FGH
 4. GHI

78. ODRS : OSRD :: PAGJ : ?
 1. PJGA
 3. PGJA
 2. PJAG
 4. PGAJ

79. EGI : NPR :: HJL : ?
 1. RTW
 3. NQT
 2. FGI
 4. TVX

80. ABC : ZYX :: IJK : ?
 1. RST
 3. RTS
 2. RQP
 4. RPQ

Directions (Q. 81 – 84): In each of the following questions, choose one number which is similar to the numbers in the given set.

81. Given set: 134, 246, 358
 1. 372
 3. 572
 2. 460
 4. 684
82. Given set: 4718, 5617, 6312, 8314
 1. 2715
 3. 5412
 2. 3410
 4. 6210
83. Given set: (6, 36, 52)
 1. (7, 49, 98)
 3. (9, 84, 45)
 2. (8, 64, 46)
 4. (11, 11, 84)
84. Given set: (63, 49, 35)
 1. (72, 40, 24)
 3. (64, 40, 28)
 2. (72, 12, 10)
 4. (81, 63, 45)

Directions (Q. 85 – 87): Study the following information carefully and answer the questions given below.

Seven Members are living in the family. Q is the daughter of P. B is the brother of R. G is the mother in law of A. B is married with A. B is the uncle of Q. D is the father of B.

85. What is the relation of B with respect to P?
 1. Brother
 2. Sister in law
 3. Brother in law
 4. Mother
86. If C is the brother of B, then what is the relation of C with respect to Q?
 1. Aunt
 2. Uncle
 3. Father
 4. Mother
87. If P is the father of Q, then what is the relation of R with respect to P?
 1. Wife
 2. Husband
 3. Father
 4. Mother
88. P is the father of Q and R is the son of S. T is the brother of P. Q is the sister of R. How's S related to T?
 1. Brother in law
 2. Daughter
 3. Sister in law
 4. Brother
89. A is three times of old as B. C was thrice as old as A four years ago. In four years time, A will be 31. What are the present ages of B and C?
 1. 9, 46
 2. 9, 50
 3. 10, 46
 4. 10, 50

90. The six faces of a dices have been marked with alphabets A, B, C, D, E and F respectively. This dice is rolled down three times. The three positions are shown as

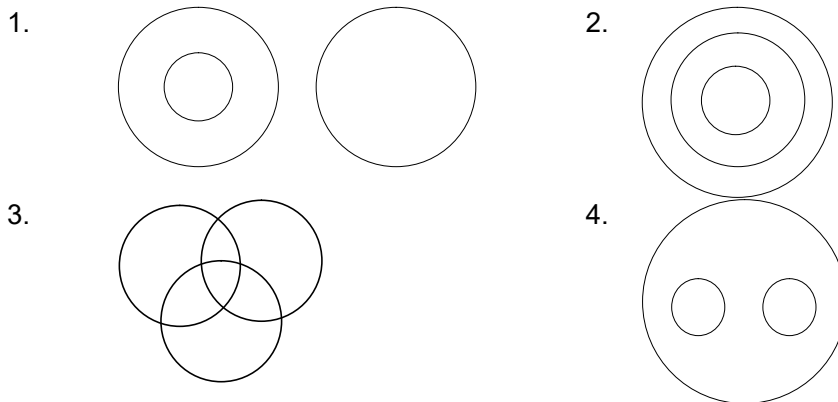


Find the alphabet opposite A.

1. C
 2. D
 3. E
 4. F

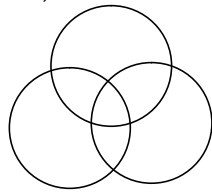
Directions (Q. 91 – 93): Identify the diagram that best represents the relationship among the classes given below.

91. Professors, Researchers, Scientists

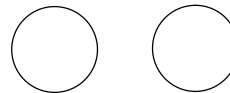


92. Tiger, Lions, Animals

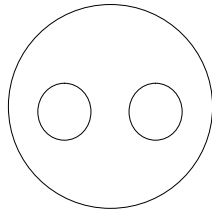
1.



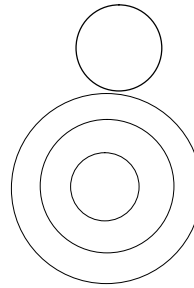
2.



3.

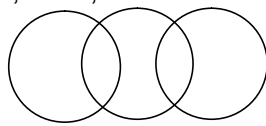


4.

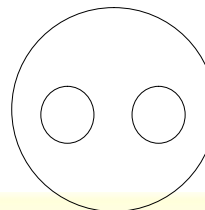


93. Travelers, Train, Bus

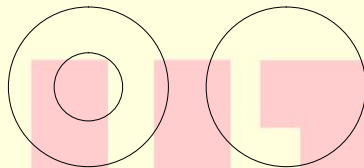
1.



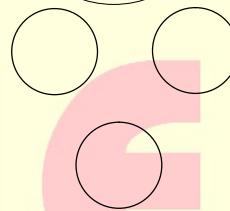
2.



3.



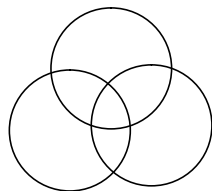
4.



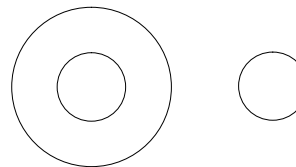
Directions (Q. 94 - 96): Each of these questions given below contains three elements. There elements may or may not have some interlinkage each group of elements may fit into one of these diagram at A, B, C and D. You have to indicate the group of elements which correctly fits into the diagrams.

94. Which of the following diagrams indicates the best relation between Judge, Thieves and Criminals?

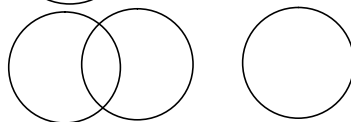
1.



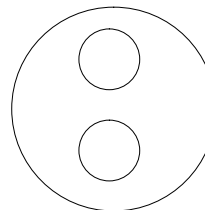
2.



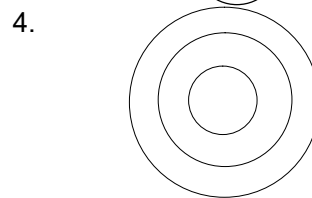
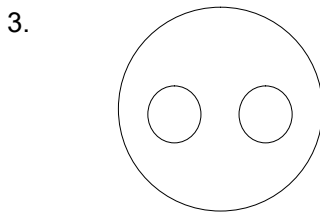
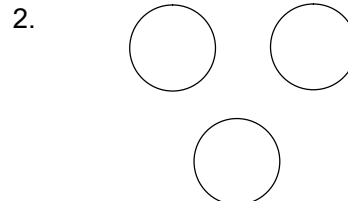
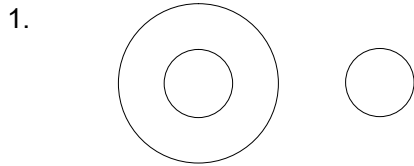
3.



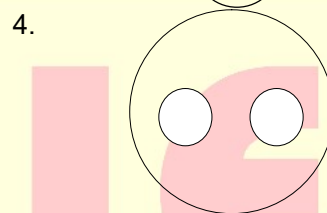
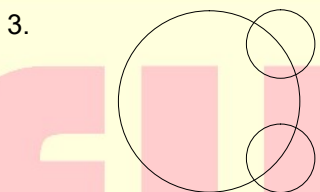
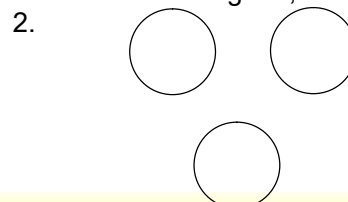
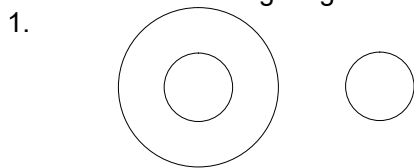
4.



95. Which of the following diagrams indicate the best relationship between India, Haryana and World?



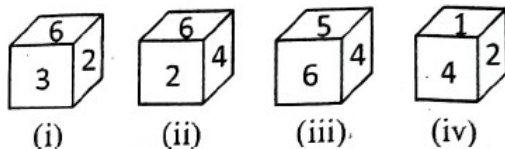
96. Which of the following diagrams indicate best relation between Pigeon, Bird and Dog?



Directions (Q. 97 - 99): In each of the following questions, certain pairs of words are given, out of which the words in all pairs except one, bear a certain common relationship choose the pair in which the word are differently related

- | | |
|---------------------------|----------------------|
| 97. 1. Principal : School | 2. Soldier : Barrack |
| 3. Artist : Troupe | 4. Singer : Chorus |
| 98. 1. Tongue : Taste | 2. Eye : Blind |
| 3. Ear : Deaf | 4. Leg : Blame |
| 99. 1. Malaria : Protozoa | 2. Yeast : Fungi |
| 3. Typhoid : Bacteria | 4. Polio : Virus |

100. The four different position of a dice are given below:



Which number is on the face opposite to 6?

- | | |
|------|------|
| 1. 1 | 2. 2 |
| 3. 3 | 4. 4 |