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NATIONAL TALENT SEARCH EXAMINATION (NTSE-2018) STAGE -1
'MADHYA PRADESH' STATE   PAPER : MAT

Date: 05/11/2017

Max. Marks: 50   **SOLUTIONS**   **Time allowed: 45 mins**

Direction : In question No.s 1 to 5 there is a number series with one term missing shown by question mark (?). This term is one of the following four alternative given. Choose the correct number from options.

1.   1, 4, 27, 16, ?, 36, 343

(A) 25   (B) 87   (C) 120   (D) 125

Ans. (D)

Sol. 1, 4, 27, 16, ?, 36, 343

Alternative terms are cubes and squares of natural numbers.

$1^3, 2^2, 3^2, 4^2, \boxed{5^3}, 6^2, 7^3$

2.   4, 7, 12, 19, 28, ?

(A) 30   (B) 36   (C) 39   (D) 49

Ans. (C)

Sol.

4,   7,   12,   19,   28,   ?
  +3   +5   +7   +9   +11

= 28 + 11 = 39

3.   10, 18, 28, 40, 54, ?, 88

(A) 68   (B) 70   (C) 71   (D) 74

Ans. (B)

Sol.

10,   18,   28,   40,   54,   ?   88
  +8   +10 +12   +14 +16

54 + 16 = 70

4.   4, 12, 36, 108, ?

(A) 144   (B) 216   (C) 304   (D) 324

Ans. (D)

Sol. 4, 12, 36, 108, ?

Each term is three times of preceeding term.

Hence = 108 × 3 = 324

5.   1, 9, 25, 49, ?, 121

(A) 64   (B) 81   (C) 91   (D) 100

Ans. (B)

Sol. 1, 9, 25, 49, ?, 121

Given numbers are squares of odd natural numbers. Hence missing number is $9^2 = 81$.

6. Bread is related to Wheat in the same way as Brick is related to.......

(A) Fire   (B) Cement   (C) Clay   (D) Building

Ans. *(C)*

Sol. Bread is made of wheat, similarly Brick is made of clay.

7. Waves is related to Air in the same way as Ripples is related to......

(A) Water   (B) Wind   (C) Storm   (D) Smoke

Ans. *(A)*

Sol. Wave propagates in air, similarly Ripples propogates in Water.

8. Accidient is related to Carefulness in the same way Disease is related to.......

(A) Treatment   (B) Medicine   (C) Sanitation   (D) Doctor

Ans. *(C)*

Sol. Carefulness avoids accident, similarly sanitation avoids diseases.

(***Note :*** This solution is according to English version of question paper. According to Hindi version, No option is correct)

Direction : In question No. 9 - 13, there is a question mark in the blank space and it is only one of the four alternatives given under the question which satisfies the same relation as is found between the two patterns to the left of the sign : : given in the question. Find the correct alternative.

9. Clock : Time : : Thermometer : ?

(A) Heat   (B) Radiation   (C) Energy   (D) Temperature

Ans. *(D)*

Sol. Clock is a device to see or measure time. Similarly thermometer measures temperature.

10. Hot : Oven : : Cold : ?

(A) Refrigerator   (B) Air Conditioner   (C) Ice Cream   (D) Snow

Ans. *(A)*

Sol. Oven is used to create hotness, similarly Refrigerator is used to create coldness.

11. Ornament : Gold : : Needle : ?

(A) Stich   (B) Steel   (C) Tip   (D) Thread

Ans. *(B)*

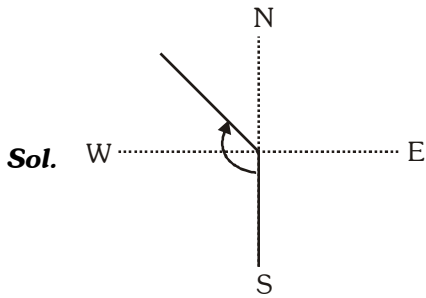*Sol.* Gold is used to make ornaments, steel is used to make needle.

12. Earth : Sun : : Moon : ?

(A) Orbit   (B) Sky   (C) Star   (D) Earth
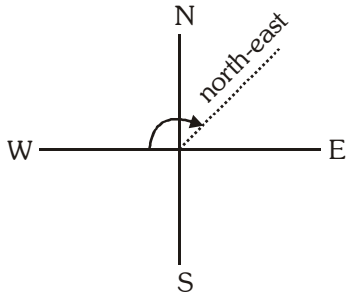
Ans. *(D)*

Sol. Earth revolves around Sun, similarly moon revolves around Earth.

13. South : North-West : : West : ?

(A) East   (B) South   (C) North-East   (D) South-West

Ans. *(C)*

Sol.

South to North-West : clockwise rotation by 135°.

West to North-East : Clockwise rotation by 135°.

14. In a certain language MYSTIFY is coded as NZTUJGZ, how is NEMESIS coded in that language ?

(A) MDLHRDR   (B) OFNFTJT   (C) ODNHTDR   (D) PGOKUGU

Ans. (B)

Sol.

M   Y   S   T   I   F   Y
+1   +1   +1   +1   +1   +1   +1
N   Z   T   U   J   G   Z

N   E   M   E   S   I   S
+1   +1   +1   +1   +1   +1   +1
O   F   N   F   T   J   T

15. In certain code SIKKIM is written as THLJJL. How is TRAINING written in that code ?

(A) UQBHOHOF   (B) SQBHOHOH   (C) UQBJOHHO   (D) UQBJOHOH

Ans. (A)

Sol.

S   I   K   K   I   M
+1   −1   +1   −1   +1   −1
T   H   L   J   J   L

```
T   R   A   I   N   I   N   G
│+1 │−1 │+1 │−1 │+1 │−1 │+1 │−1
▼   ▼   ▼   ▼   ▼   ▼   ▼   ▼
U   Q   B   H   O   H   O   F
```

16. If in a certain language, POPULAR is coded as QPQVMBS, which word would be coded as GBNPVT ?

(A) FAMOSU (B) FAMOUS (C) FASOUM (D) FOSAUM

Ans. *(B)*

Sol.
```
P   O   P   U   L   A   R
│+1 │+1 │+1 │+1 │+1 │+1 │+1
▼   ▼   ▼   ▼   ▼   ▼   ▼
Q   P   Q   V   M   B   S
```

```
F   A   M   O   U   S
│+1 │+1 │+1 │+1 │+1 │+1
▼   ▼   ▼   ▼   ▼   ▼
G   B   N   P   V   T
```

17. If PAINT is coded as 74128 and EXCEL is coded as 93596, then how would you code ACCEPT ?

(A) 554978 (B) 735961 (C) 547978 (D) 455978

Ans. *(D)*

Sol.
```
P   A   I   N   T        E   X   C   E   L
│   │   │   │   │    ;   │   │   │   │   │
▼   ▼   ▼   ▼   ▼        ▼   ▼   ▼   ▼   ▼
7   4   1   2   8        9   3   5   9   6
```

```
    A   C   C   E   P   T
    │   │   │   │   │   │
∴   ▼   ▼   ▼   ▼   ▼   ▼
    4   5   5   9   7   8
```

18. If Z = 52 and ACT = 48, then BAT will be equal to :

(A) 39 (B) 44 (C) 46 (D) 50

Ans. *(C)*

Sol. Z = 52, ACT = 48

Z is at 26th place its code $26 \times 2 = 52$

```
A   C   T
│   │   │
▼   ▼   ▼
1 + 3 + 20 = 24
```

Its code $24 \times 2 = 48$

```
    B   A   T
    │   │   │
∴   ▼   ▼   ▼
    2 + 1 + 20 = 23
```
Hence its code $23 \times 2 = 46$

19. Choose the odd one out from following :

(A) Ear   (B) Eye   (C) Nose   (D) Throat

Ans. (D)

Sol. Ear, eye and nose are sense-organs whereas throat is not a sense-organ.

20. A woman introduce a man as the son of the brother of her mother. How is the man related to the women ?

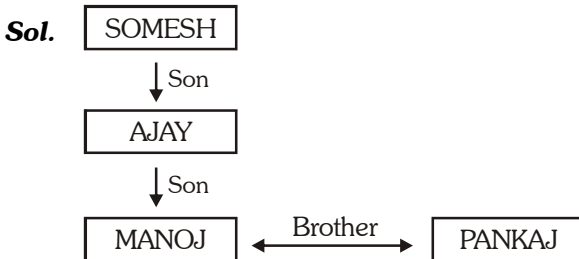(A) Cousin   (B) Son   (C) Nephew   (D) Grandson

Ans. (A)

Sol. Her mother's brother is her maternal uncle and maternal uncle's son is her cousin.

21. Manoj has brother Pankaj. Manoj is the son of Ajay. Somesh is Ajay's father. How Pankaj is related to Somesh ?

(A) Son   (B) Grandson   (C) Brother   (D) Grand Father

Ans. (B)

Sol.

Pankaj is grandson of Somesh.

22. Today is Akash's Birthday. One year from today, he will be twice as old as he was 12 years ago. How old is Akash today ?

(A) 25 years   (B) 27 years   (C) 20 years   (D) 22 years

Ans. (A)

Sol. Let present age of Akash be x years. After one year, he will be (x + 1) years old and twelve years ago, he was (x – 12) years old.

x + 1 = 2(x – 12)

x = 25 years.

23. A father is now three times as old as his son. Five years back, he was four times as old as his son. The age of the son (in years) is :

(A) 12   (B) 15   (C) 18   (D) 20

Ans. (B)

Sol. Let present age of son be x years.

∴ Fathers age = 3x

Five years back son was (x – 5) years old and father was (3x – 5) years old.

$\Rightarrow$ (3x – 5) = 4 (x – 5)

x = 15

24. If the seventh day of a month is three days earlier than Friday, what day will it be on the nineteenth day of the month?

(A) Monday　　　(B) Wednesday　　　(C) Friday　　　(D) Sunday

Ans. (D)

Sol. 7th day = three days earlier than friday.

⇒ 7th day = Tuesday

⇒ 19th day = Sunday

25. Saturday was a holiday for Republic Day, 14th of the next month is again holiday for Shivratri. What day was it on the 14th ?

(A) Monday　　　(B) Thursday　　　(C) Tuesday　　　(D) Saturday

Ans. (B)

Sol. Republic day - 26th January = Saturday.

14th Feb = Thursday.

26. Lalit ranks seventh from top and twenty-sixth from bottom in a class. How many students are there in the class ?

(A)34　　　(B) 33　　　(C) 32　　　(D) 31

Ans. (C)

Sol.

7th from top

↓

| Lalit |

↑

26th from bottom

Total number of students

$7 + 26 - 1 = 32$

27. Pooja is fourteenth from the right end in a row of 40 girls. What is her position from the left end ?

(A)27th　　　(B) 26th　　　(C) 25th　　　(D) 24th

Ans. (A)

Sol. Her position from left

$= 40 - (14 - 1) = 27th$

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

(A) North-east　　　(B) South-west　　　(C) North-west　　　(D) South-east

Ans. (B)

Sol.

North-east

↗

↓　　　　↙

South　　South-west
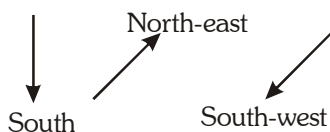
29. A girl goes 30 meters North, then turns right and walks 40 meters, then turns right and walks 20 meters, then again turns right and walks 40 meters. How many meters is she from the original position ?

(A) 0 meter   (B) 40 meters   (C) 20 meters   (D) 10 meters
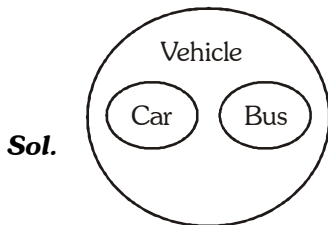
Ans. (D)

Sol.
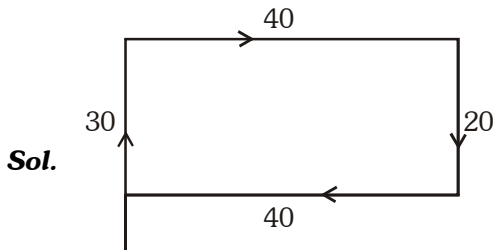
Net displacement = 10 meters

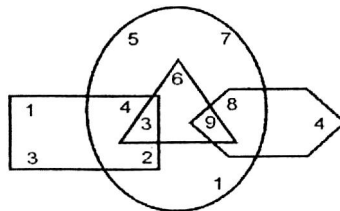**30.** Which of the following Venn-diagram correctly illustrate the relationship among the classes (Bus, Car and Vehicle)?

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

Ans. (C)

Sol.

Direction : Study the figure given below and answer the question no. 31 to 33.

Figure

31. What is the sum of the numbers which belongs to two figures only ?

(A) 6   (B) 15   (C) 20   (D) None of these

Ans. (C)

Sol. Sum of numbers belongs to two figures only

= 4 + 2 + 6 + 8 = 20

32. What is the product of the numbers which belongs to the three figures only ?

(A)27   (B) 162   (C) 648   (D) None of these

Ans. **(A)**

Sol. Product of the numbers which belongs to the three figures only.

$= 3 \times 9 = 27$

33. What is the sum of numbers which belong to one figure only ?

(A) 5   (B) 16   (C) 21   (D) None of these

Ans. **(C)**

Sol. Sum of the numbers which belongs to one figure only.

$= 1 + 3 + 5 + 7 + 1 + 4 = 21.$

Direction : Study the number series given below and answer the questions (34) and (35).

Series

6, 4, 1, 2, 2, 8, 7, 4, 2, 1, 5, 3, 8, 6, 2, 1, 7, 1, 4, 3, 1, 2, 8, 6

34. How many pairs of successive numbers having difference of 2 each ?

(A) Four   (B) Five   (C) Six   (D) Seven

Ans. (C)

Sol. Pairs of successive numbers having difference of 2 each

6,4 , 4,2 , 5,3 , 8,6 , 3,1 , 8,6

35. Which figure have equal frequencies ?

(A)4, 6, 8   (B) 1, 4, 6   (C) 1, 2, 3   (D) 4, 5, 7

Ans. **(A)**

Sol.

Number	Frequency
1	5
2	5
3	2
4	3
5	1
6	3
7	2
8	3

Figures having equal frequencies = 4, 6, 8.

Direction : Study the following figure carefully and answer the question number (36) and (37).
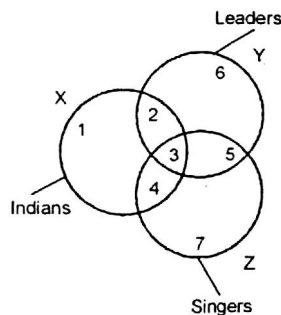
Note : 1, 2, 3, 4, 5, 6, 7 shows the region.

36. Which region denotes Indian Leaders who are not singers ?

(A) 5   (B) 4   (C) 3   (D) 2

Ans. (D)

Sol. Indian leaders who are not singers is represented by region 2.

37. Which region represents Indian singers who are not leaders ?

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

Ans. (B)

Sol. Indian singers who are not leaders is represented by region 4.

Direction : In question numbers (38) to (42) find the missing number/character marked with question mark (?).

38.
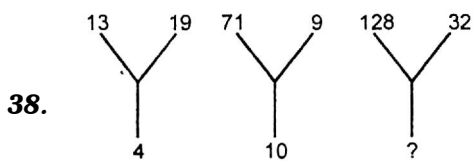
(A) 10   (B) 15   (C) 20   (D) 25

Ans. (C)

Sol. In the figure I,

$$\frac{13+19}{8} = 4$$

In the figure II,

$$\frac{71+9}{8} = 10$$

In the figure III,

$$\frac{128+32}{8} = \frac{160}{8} = 20$$

39.
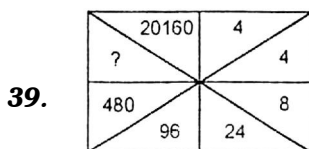
(A) 2880   (B) 2800   (C) 2400   (D) 1920

Ans. (A)

Sol. In a small rectangle,

in C-W direction, by multiplying 1, then by 2, then by 3, then by 4, then by 5, then by 6.

∴ The required no. is 480 × 6 = 2880.

40.
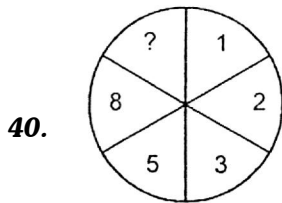
(A) 10   (B) 12   (C) 13   (D) 15

Ans. *(C)*

Sol. In C–W direction, by adding two successive terms, we get next term (i.e. in fibonacci series)

$1 + 2 = 3$, $2 + 3 = 5$, $5 + 8 = 13$

The required no. is 13.

41.

5	4	9
6	3	?
7	2	4
65	20	45

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

Ans. *(A)*

Sol. Column wise, by adding 6 and 7 then multiply by 5, we get 65

i.e. $(6 + 7) \times 5 = 65$

similarly, $(3 + 2) \times 4 = 20$

similarly, $(1 + 4) \times 9 = 45$

42.

A	D	H
F	I	M
?	N	R

(A) A   (B) N   (C) O   (D) K

Ans. *(D)*

Sol. Alphabetic rank, row wise

$A \xrightarrow{+3} D \xrightarrow{+4} H$

$F \xrightarrow{+3} I \xrightarrow{+4} M$

$\boldsymbol{K} \xrightarrow{+3} N \xrightarrow{+4} R$

Direction : Question number (43) to (47) have a series with four figures called the problem figures. Bearing series in mind, choose the correct fifth blank figure (marked with ?) from answer figures.

43. **Problem Figure**

Answer Figure

(A)   (B)   (C)   (D)
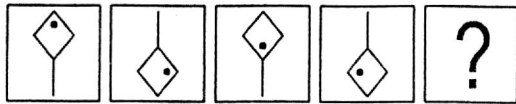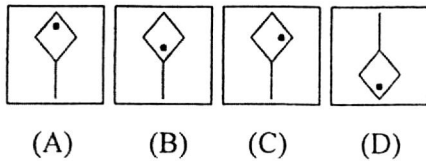
Ans. **(A)**

Sol. by observation

44. **Problem Figure**

Answer Figure
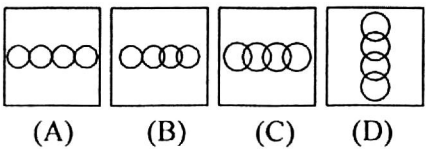
(A)   (B)   (C)   (D)

Ans. **(C)**

Sol. By moving alternatively in horizontal and vertical direction and adding one more circle.

45. **Problem Figure**

Answer Figure
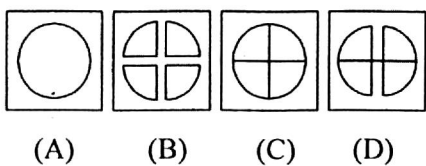
(A)   (B)   (C)   (D)

Ans. **(B)**

Sol. By observation

46. **Problem Figure**
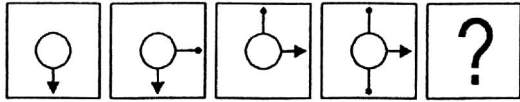
Answer Figure
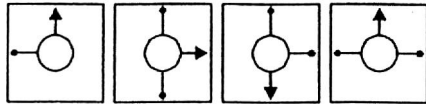
(A)　　(B)　　(C)　　(D)

Ans. ***(D)***

Sol. By observation

47. **Problem Figure**

Answer Figure
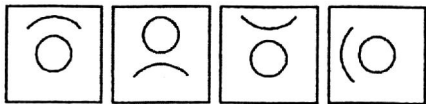
(A)　　(B)　　(C)　　(D)

Ans. ***(A)***

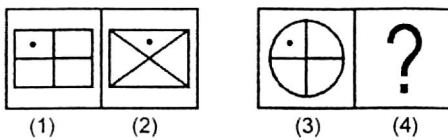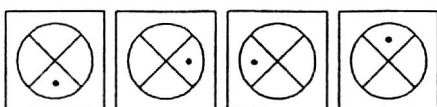***Sol.*** By observation

Direction : Each of the following questions (48) to (50) consists of two sets of figures namely 1, 2, 3 & 4, called problem figures, while fig. (A), (B), (C) & (D) constitute the Answer Set. There is a definite relation between figure 1 & 2. Establish a similar relation between figures 3 & 4 by choosing suitable fig. 4 from the Answer Set.

48. **Problem Figure**

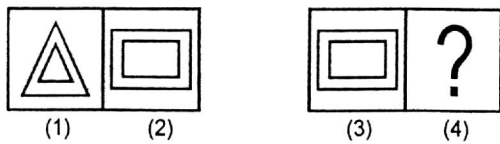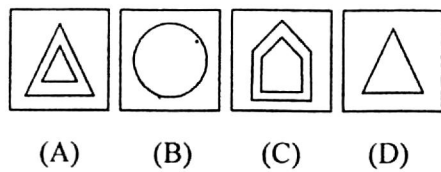(1)　　(2)　　　(3)　　(4)

Answer Figure

(A)　　(B)　　(C)　　(D)

Ans. *(D)*

Sol. By observation

49. ***Problem Figure***

Answer Figure

Ans. *(C)*

Sol. By observation

50. ***Problem Figure***
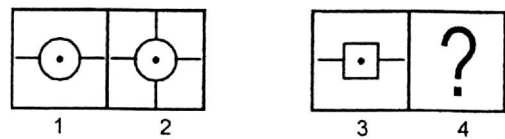
Answer Figure

Ans. *(B)*

Sol. By observation