MATRIX OLYMPIAD

CSR Initiative of Matrix Education, Sikar to motivate and reward young talent.

☑ **Total Questions : 60**   ☑ **Maximum Marks : 240**   ☑ **Duration : 2 Hrs.**

PAPER PATTERN

Part	(I) Physics	(II) Chemistry	(III) Biology	(IV) Mathematics	(V) Logical Reasoning & IQ
Number of Questions	7	6	7	30	10

Marking Scheme: +4 For Each Correct Answer (There is no negative for wrong answer)

Instructions :

1. This Booklet is your **Question Paper.** DO NOT **break seal** of Booklet until the invigilator instructs to do so.
2. The Answer Sheet is provided to you separately which is a machine readable Optical Response Sheet (ORS). You have to mark your answer in the ORS by darkening bubble, as per your answer choice , by using **Black** /**Blue** ball point pen only.
3. If you are found involved in **cheating** or disturbing others then your ORS will be cancelled.
4. Do not **damage** the ORS sheet in any manner. If ORS is damaged or not completed properly, your results will not be prepared.
5. If you have any **confusion** in filling-up ORS sheet, please **contact** your invigilator. Incomplete ORS will be not be evaluated.
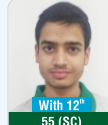6. You can take the question paper home once the ORS is submitted.
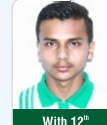
Answer Key and Video Solutions Kindly Scan QR Code and subscribe Matrix youtube channel

MATRIX: Where producing outstanding results is a habit!

JEE ADVANCED TOPPERS

Name	AIR	Category
Mayank Soni	AIR 26	(Gen.) With XII
Priyanshu Meel	AIR 154	(Gen.) With XII
Nagendra Singh	AIR 220	(Gen.) With XII
Mohit Modi	AIR 296	(Gen.) With XII
Aman Nehra	AIR 356	(Gen.) With XII
Himanshu Rewar	AIR 358	(Gen.) With XII
Aarish	AIR 415	(Gen.) With XII
Uttam Paharia	AIR 421	(Gen.)

JEE MAIN TOPPERS

Name	%tile	AIR	Category
Mayank Soni	100 %tile	AIR 34	(Gen.) With XII
Nagendra Singh	99.99 %tile	AIR 123	(Gen.) With 12th 15 (OBC)
Shailesh Saini	99.97 %tile	AIR 354	(Gen.) With 12th 55 (SC)
Mohit Modi	99.98 %tile	AIR 213	(Gen.) With XII
Aman Nehra	99.97 %tile	AIR 393	(Gen.) With XII
Satyam Sharma	99.97 %tile	AIR 426	(Gen.) With 12th
Anupam Jakhar	99.96 %tile	AIR 478	(Gen.) With XII
Uttam Paharia	99.95 %tile	AIR 509	(Gen.)

NEET (UG) Toppers

Name	Marks	AIR
Rekha Nitharwal	680	AIR 1665
Narendra Farroda	670	AIR 2905
Mahendra Yadav	667	AIR 3263
Ankit Kumar Chahar	666	AIR 3378
Deepika Soni	665	AIR 3545
Lokesh Goyal	665	AIR 3621
Mohit Haritwal	665	AIR 3661

KVPY TOPPERS

Name	AIR	Stream
Manas Jajodia	AIR 6 (Gen.)	Stream- SB
Ishu	AIR 8 (Gen.)	Stream- SB
Lakshaya	AIR 13 (Gen.)	Stream- SB
Akshay Choudhary	AIR 17 (Gen.)	Stream- SB
Chirag Indoria	AIR 37 (Gen.)	Stream- SB

STSE TOPPERS

Name	Rank	Class
Aman Nehra	1st State Rank	Class 12th
Aman Nehra	2nd State Rank	Class 12th
Dinesh Kumar	2nd State Rank	Class 12th
Pranshu Bharia	2nd State Rank	Class 10th
Shrishti	2nd State Rank	Class 10th
Rohit Yadav	2nd State Rank	Class 10th
Dev Kumar	3rd State Rank	Class 10th
Mohd. Farhan	3rd State Rank	Class 10th

OUR BOARD TOPPERS

Name	Percentage	Class
Pinakin Choudhary	99.20%	Class 10th
Aradhya Raina	98.80%	Class 10th
Laxmi	98.20%	Class 10th
Vishal Choudhary	98.00%	Class 10th
Preksha Singh	97.80%	Class 10th
Piyush Sagatani	97.80%	Class 12th
Khushee Binwal	97.60%	Class 12th
Reena	97.60%	Class 12th
Siddhant Lalpuria	97.60%	Class 12th
Rohit Yadav	97.40%	Class 12th

NTSE TOPPERS

Name	Rank
Aditya Jhajhria	1st State Rank
Nayan Godara	1st State Rank
Aman Nehra	1st State Rank
Aaditya Pratap	2nd State Rank
Mayank Soni	2nd State Rank
Aditya Bijarniya	4th State Rank
Pragati	5th State Rank

Authenticity of result, promise of Matrix!
*cumulative result so far

यह परिणाम मैट्रिक्स के केवल Yearlong classroom Program Students का ही है

Remarkable result growth in both JEE Main & Advanced on a consistent basis

JEE Main Qualified students from Matrix

2015	2016	2017	2018	2019	2020	2021*	2022	2023
176	453	800	832	892	1000	930	1120	1732

JEE Advanced Qualified students from Matrix

2015	2016	2017	2018	2019	2020	2021*	2022	2023
51	126	295	362	402	446	410	434	523
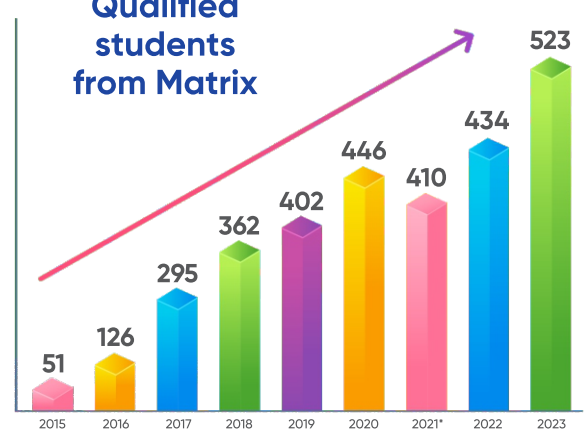
*due to covid

Note : All results are from Matrix year long classroom program at Sikar only.

"Authenticity of result, promise of Matrix"

HIGHLIGHTS at MATRIX

Total students qualified in JEE Main

6700+ students have been qualified in JEE main from matrix till date.

2500+ students have qualified JEE Advanced till date – Highest in Sikar

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2023 RESULT

Top score in JEE Main 2023 **Mayank Soni**

Rank- **34**

Top scorer JEE Advanced 2023 **Mayank Soni**

AIR- **26** (Gen)

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200 Doctors in very 1st year of **Matrix NEET Division**

All India Rank **6** in **KVPY 2021: MANAS JAJODIA**

55+ total selections in KVPY over last 4 years **45+**

More than 40,000 students have been beneficiary of **Matrix system till date**

Matrix has the largest pre-foundation career program in Sikar with highest number of enrolment and top results in all sort of competitive examinations.

2000+ final admissions in various top IITs over last 5 years – Highest in Sikar

3500+ selection in NIT/IIITs and other or other Prestigious Universities Highest in Sikar

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Matrix System has produced one of the highest **NDA** selections in Sikar at a very early stage. **70** selections in NDA 2023 April attempt!

The Most **INNOVATIVE INSTITUTE** for **NEET, JEE & Pre-foundation** Covering & Serving **5** Major State of the Country

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Every student matters! Every student has potential!

Highest quality of management and student care for each student

MATRIX OLYMPIAD
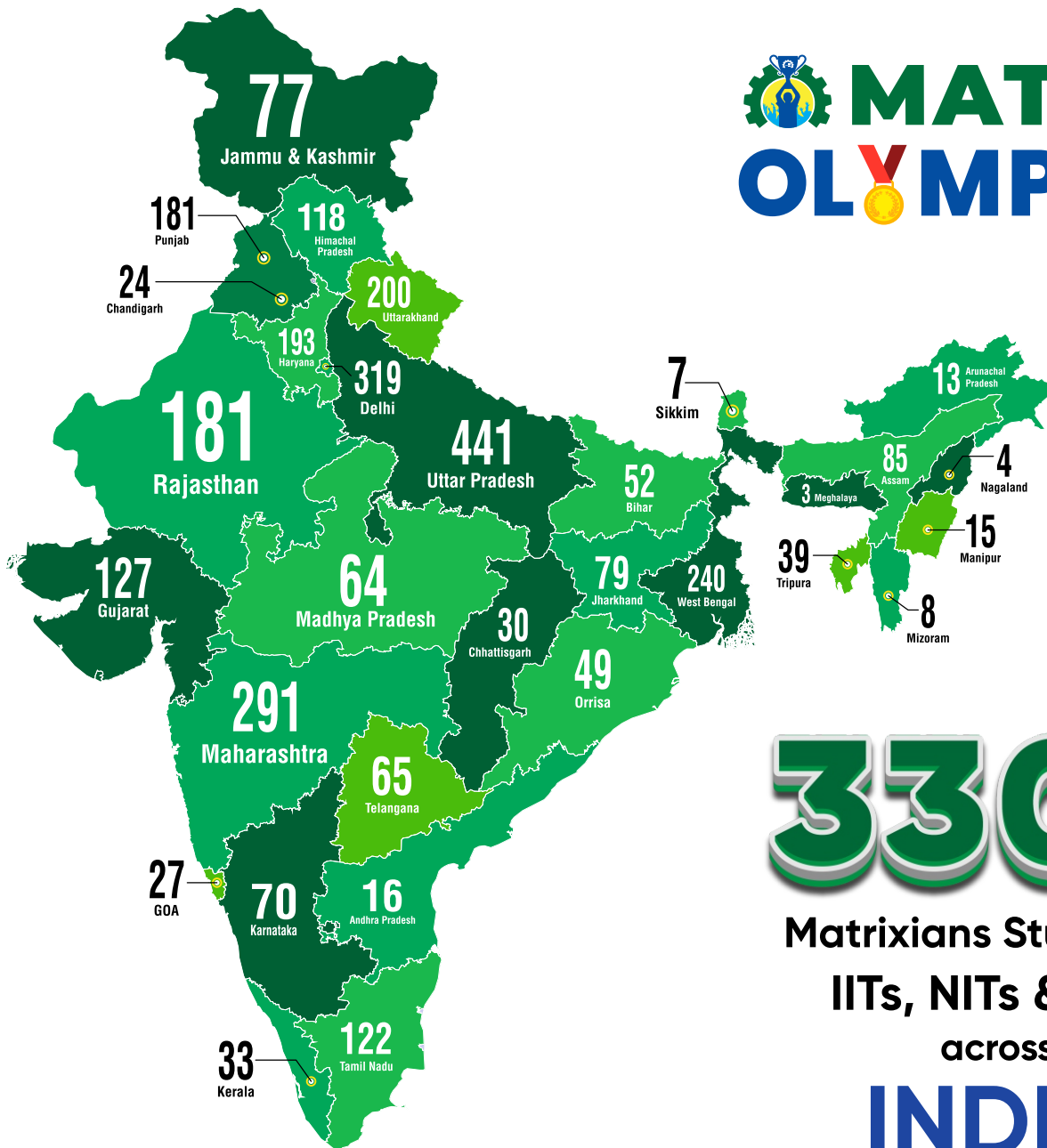
3302 Matrixians Studied at IITs, NITs & IIITs across **INDIA**

Jammu & Kashmir — 77
Punjab — 181
Himachal Pradesh — 118
Chandigarh — 24
Uttarakhand — 200
Haryana — 193
Delhi — 319
Rajasthan — 181
Uttar Pradesh — 441
Sikkim — 7
Arunachal Pradesh — 13
Assam — 85
Nagaland — 4
Bihar — 52
Meghalaya — 3
Manipur — 15
Gujarat — 127
Madhya Pradesh — 64
Jharkhand — 79
West Bengal — 240
Tripura — 39
Mizoram — 8
Chhattisgarh — 30
Orrisa — 49
Maharashtra — 291
Telangana — 65
GOA — 27
Karnataka — 70
Andhra Pradesh — 16
Kerala — 33
Tamil Nadu — 122

PART I : PHYSICS

*This section contains **07 Multiple Choice Questions (Q : 01 to Q : 07)**. Each question has four choices* **(A), (B), (C) and (D)** *out of which **ONLY ONE** is correct.*

1. Which of the following is not a derived physical quantity?

(A) Acceleration

(B) Velocity

(C) Speed

(D) Length

2. Which of the following is not a luminous light source?

(A) Fireflies

(B) The moon

(C) Electric bulb

(D) Candle

3. One metric ton = _____.

(A) 1000 kg

(B) 100 quintals

(C) 10 megagram

(D) 1000 nanogram

4. Which of the following statement/s is/are **True(T)** or **False(F)** ?

(i) A light source, an opaque object and an opaque screen is required to form a shadow.

(ii) Image formed by a pinhole camera is always virtual, erect and same in size as object.

(iii) Image formed by a plane mirror is always laterally inverted.

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Code :

	(i)	(ii)	(iii)
(A)	T	F	T
(B)	T	T	T
(C)	F	F	T
(D)	F	T	F

5. The SI unit of amount of substance is -

(A) candela

(B) ampere

(C) mole

(D) coulomb

6. Match **Column – I** with **Column – II** and select the correct answer using the codes given below.

Column – I	Column – II
P. Incandescent source	**1.** LED
Q. Luminescent source	**2.** Neon lamp
R. Gas discharge source	**3.** Red hot iron rod in forge

Code :

	P	Q	R
(A)	2	3	1
(B)	3	1	2
(C)	1	2	3
(D)	2	1	3

Space for rough work

7. On the day of an eclipse, Jaadu and Rohit are observing the shadow formed on earth due to the eclipse. They are trying to understand the nature of the eclipse in different regions according to the much darker shadow and less - darker shadow. Help them by answering the following question.
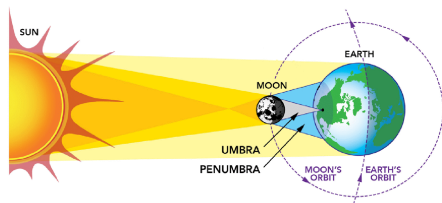
Based on the above diagram, in the darkest region of shadow _____ eclipse occurs and in less - darker region _____ eclipse occurs.

(A) Total solar, Partial solar

(B) Total lunar, Partial lunar

(C) Partial lunar, Total lunar

(D) Total solar, Partial lunar

Space for rough work

PART II : CHEMISTRY

This section contains 06 Multiple Choice Questions (Q : 08 to Q : 13). Each question has four choices (A), (B), (C) and (D) out of which ONLY ONE is correct.

8. Cotton plants are usually grown at places having :
   (A) Residual red soil and cold climate
   (B) Black soil and warm climate
   (C) Alluvial soil and warm climate
   (D) Black soil and cold climate

9. Which pair of substances among the following can be grouped as soft materials ?
   (A) Wood, Cotton
   (B) Aluminium, Diamond
   (C) Wax, Sponge
   (D) Wood, Stone

10. From the given options choose the one that does not belongs to the group.
    (A) Milk
    (B) Honey
    (C) Oil
    (D) Ink

11. Which of the following statement/s is/are **True(T)** or **False(F)** ?
    (i) Iron, copper and aluminium are examples of lustrous materials.
    (ii) Oil floats on water because it is less denser than water.
    (iii) Materials are grouped together for convenience and to study their properties.

Code :

	(i)	(ii)	(iii)
(A)	T	F	F
(B)	T	T	T
(C)	F	F	T
(D)	F	T	F

12. Match **Column – I** with **Column – II** and select the correct answer using the codes given below.

Column – I	Column – II
P. The process of separating cotton from seeds	1. Weaving
Q. A single yarn is used to make fabric	2. Knitting
R. The process of making fabric from yarn	3. Ginning

Code :

	P	Q	R
(A)	2	3	1
(B)	3	2	1
(C)	3	1	2
(D)	2	1	3

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13. The process of making yarn from fibres is called spinning. Fibres from a mass of cotton wool are drawn out and twisted. This brings the fibres together to make a strong yarn. In the villages of India, lint is directly spun into yarn on a 'spinning wheel' or charkha. Another simple device for spinning yarn is the hand spindle or takli.
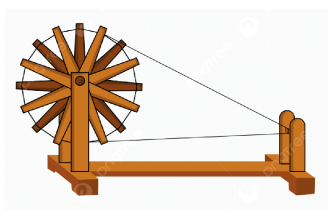
Twisting of fibres into yarn increases the _____of fibres.

(A) Shine

(B) Strength

(C) Price

(D) None of these

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Space for rough work

"Be passionate and bold. Always keep learning. You stop doing useful things if you don't learn."

PART III : BIOLOGY

This section contains 07 Multiple Choice Questions (Q : 14 to Q : 20). Each question has four choices (A), (B), (C) and (D) out of which ONLY ONE is correct.

14. Composition of fats are _____ .
    (A) Carbon, Sulphur and Hydrogen
    (B) Carbon, Sulphur and Nitrogen
    (C) Oxygen, Nitrogen and Hydrogen
    (D) Oxygen, Carbon and Hydrogen

15. Starch can be tested by using _____ .
    (A) Iodine Solution
    (B) Caustic Soda
    (C) Copper Sulphate
    (D) Fehling's Solution

16. Which part of a mustard plant is edible ?
    (A) Seeds and flowers
    (B) Leaves and flowers
    (C) Seeds and leaves
    (D) Stem and roots

17. Honey bees are often seen sitting on flowers. Why do they do so ?
    (A) They like flowers
    (B) They lay eggs on flowers
    (C) They suck nectar from flowers
    (D) All of these

18. Match **Column – I** with **Column – II** and select the correct answer using the codes given below.

Column – I	Column – II
P. Amla	**1.** Iodine
Q. Carrot	**2.** Vitamin C
R. Salt	**3.** Vitamin A

    Code :

	P	Q	R
(A)	2	3	1
(B)	3	1	2
(C)	3	2	1
(D)	1	2	3

19. Which of the following statement/s is/are **True(T)** or **False(F)** ?
    (i) Different people have different choices of food.
    (ii) If a person does not get food he feels weak and is likely to fall ill.
    (iii) Human beings, animals, birds, insects, etc. eat the same type of food.

    Code :

	(i)	(ii)	(iii)
(A)	T	F	F
(B)	T	T	T
(C)	F	F	T
(D)	T	T	F

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Space for rough work

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20. Our body requires Vitamins and Minerals for various vital processes of life and for formation of blood, bones and teeth. These Vitamins and Minerals though needed in small quantities are very important for various bodily functions. Which of the following labelled boxes contain protective food ?
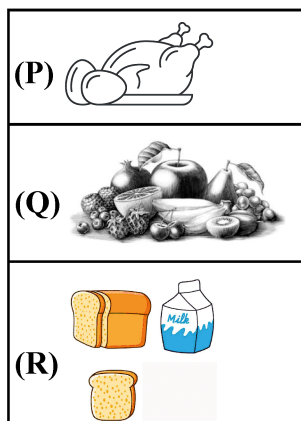
(A) P and Q

(B) Q only

(C) R only

(D) Q and R

PART IV : MATHEMATICS

*This section contains **30 Multiple Choice Questions (Q : 21 to Q : 50)**. Each question has four choices (A), (B), (C) and (D) out of which **ONLY ONE** is correct.*

21. Place value of 8 in 86,93,04,600 is :
(A) Eight crores
(B) Eighty crores
(C) Crores
(D) Eighty six crore

22. How is 498 written in roman numberals ?
(A) CDCXVIII
(B) CDCXIV
(C) CDXCVIII
(D) CDXCVII

23. Choose the correct order :
(A) 85678 > 84321 > 86721
(B) 84321 < 85678 < 86721
(C) 54679 > 45645 > 46452
(D) 64532 < 72896 < 54763

24. Which of the following is correct statement ?
(A) 999 + 1 = 10 × 1000
(B) Greatest 2 digit number +1 = Smallest 3 digit number
(C) 999 + 1 = 100000
(D) Greatest 3 digit number +1 = Smallest 3 digit number

25. The difference between the greatest 6 - digits number and lowest 4- digit number is :
(A) 999999
(B) 988997
(C) 998999
(D) 998877

26. Which of the following represents associative property ?
(A) $a + b = b + a$
(B) $a \times (b + c) = (a \times b) + (a \times c)$
(C) $(a + b) + c = a + (b + c)$
(D) $a \times (b - c) = (a \times b) - (a \times c)$

27. Three consecutive successor of 583699 are :
(A) 583700, 583701, 583702
(B) 583698, 583697, 583696
(C) 583799, 583899, 583999
(D) 583701, 583704, 583703

28. If the school canteen charges Rs. 200 for lunch and Rs. 10 for milk for each day, then find the total money spend in 6 days on these things.
(A) Rs. 210
(B) Rs. 2100
(C) Rs. 21000
(D) Rs. 1260

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Space for rough work

B06151023

29. A number is divisible by both 5 and 12. By which other number will that number be always divisible ?

(A) 50

(B) 60

(C) 70

(D) 80

30. The least 5 digit number which is exactly divisible by each of 2, 3, 4, 5, 6 and 7 is :

(A) 96500

(B) 14200

(C) 10,080

(D) 96605

31. How many prime numbers are there in between 20 and 70 ?

(A) 9

(B) 13

(C) 11

(D) 16

32. Find the smallest value of '⊕' in the number 156 ⊕ 0. So that it is divisible by 10 is :

(A) 2

(B) 1

(C) 0

(D) All of these

33. Which of the following does not represent a ray in the given figure ?
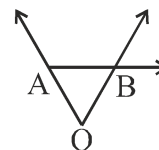
(A) $\overrightarrow{OA}$

(B) $\overrightarrow{OB}$

(C) $\overrightarrow{BA}$

(D) $\overrightarrow{AB}$

34. If three or more straight lines pass through the same point, then the lines are called :

(A) Parallel lines

(B) Intersecting line

(C) Perpendicular line

(D) Concurrent lines

35. If end points of a curve are joined, then it is said to be :

(A) Closed curve

(B) Open curve

(C) Fined curve

(D) Loose curve

36. The relation between radius (r) and diameter (d) of a circle is :

(A) d = r/3

(B) d = 3r

(C) $d = \dfrac{r}{2}$

(D) d = 2r

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Space for rough work

B06151023

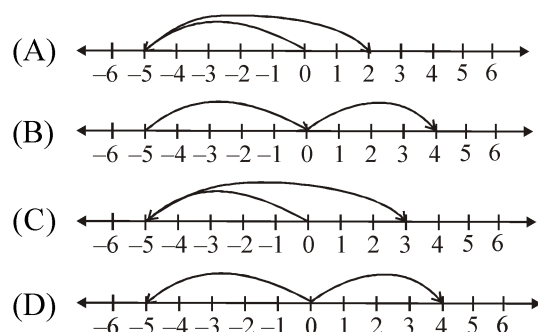**37.** Which of the following are arranged in decending order ?

(A) –428, –386, –213, 428, 936

(B) –881, –954, –287, –1018, –3261

(C) 428, –628, –936, –1059, –2361

(D) –421, –331, 248, 794, 542

38. On the number line "– 50" lies to the :

(A) Left of –60

(B) Right of 50

(C) Right of –60

(D) Right of 0

39. Which of the following number line represents $(-5) + 8$?

(A)

(B)

(C)

(D)

40. A gardner plans to plant 630 trees in 21 rows each containing the same number of trees, then how many trees will be there in each row ?

(A) 300

(B) 30

(C) 21

(D) 3

41. Which of the following statement/s is/are **True(T)** or **False(F)** ?

(i) For any integer a, $a \div a = -1$.

(ii) The product of two numbers with opposite sign is always negative.

(iii) The multiplicative identity for integers is –1.

Code :

	(i)	*(ii)*	*(iii)*
(A)	T	F	F
(B)	T	T	T
(C)	F	F	T
(D)	F	T	F

42. Which of the following statement/s is/are **True(T)** or **False(F)** ?

(i) A circle have more than one centre.

(ii) The region bounded by chord and minor arc is called minor segment.

(iii) A line segment has a finite length.

Code :

	(i)	*(ii)*	*(iii)*
(A)	T	F	F
(B)	F	T	T
(C)	F	F	T
(D)	F	T	F

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Space for rough work

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43. Which of the following statement/s is/are **True(T)** or **False(F)** ?

  (i) Zero is the smallest whole number.

  (ii) The whole number zero has no predeccessor.

  (iii) All whole numbers are natural number.

  Code :

	(i)	(ii)	(iii)
(A)	T	T	F
(B)	T	T	T
(C)	F	F	T
(D)	F	T	F

44. Match **Column – I** with **Column – II** and select the correct answer using the codes given below.

Column – I	Column – II
P. $(-7) - 8 - (-25)$	**1.** 09
Q. $(-13) + 32 - 8 - 4$	**2.** 07
R. $50 - (-40) - 81$	**3.** 10

  Code :

	P	Q	R
(A)	3	2	1
(B)	3	1	2
(C)	2	1	3
(D)	2	3	1

45. Match **Column – I** with **Column – II** and select the correct answer using the codes given below.

Column – I	Column – II
P. A number divisible by 12 is :	**1.** 121
Q. 7th Multiple of 15.	**2.** 180
R. Multiple of 11	**3.** 105

  Code :

	P	Q	R
(A)	3	2	1
(B)	3	1	2
(C)	2	1	3
(D)	2	3	1

46. Match **Column – I** with **Column – II** and select the correct answer using the codes given below.

Column – I	Column – II
P. Five sixth of a straight angle	**1.** 150°
Q. Three right angle	**2.** 72°
R. $\frac{4}{5}$ of a right angle	**3.** 270°

  Code :

	P	Q	R
(A)	3	2	1
(B)	1	3	2
(C)	2	1	3
(D)	2	3	1

Space for rough work

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Paragraph for Questions 47 & 48

If a, b, c are three whole numbers then-

(a + b) + c = a + (b + c)

a × (b + c) = (a × b) + (a × c)

47. Find the value of 1546 + (984 + 5389)

(A) 1917

(B) 2530

(C) 7990

(D) 7919

48. Find the product of 125 × 109 ?

(A) 10900

(B) 13625

(C) 12500

(D) 13256

Paragraph for Questions 49 & 50

Faces : The flat surface of any solid is called face.

Edges : Line segment where two faces meet is called an edge.

Vertices : Corners of the solids are its vertices.

49. Find the number of faces of tetrahedron.

(A) 4

(B) 8

(C) 6

(D) 5

50. Find the number of edges of rectangular prism.

(A) 12

(B) 8

(C) 6

(D) 10

***** B06151023 *****

Space for rough work

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PART V : LOGICAL REASONING & IQ

This section contains 10 Multiple Choice Questions (Q : 51 to Q : 60). Each question has four choices (A), (B), (C) and (D) out of which ONLY ONE is correct.

Direction (51 – 52) : In each of the following questions, 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.

51. 1, 5, 13, 25, 41, ?

 (A) 51

 (B) 57

 (C) 61

 (D) 63

52. 1, 1, 4, 8, 9, 27, 16, ?

 (A) 32

 (B) 64

 (C) 81

 (D) 256

53. In the given question, various terms of an alphabet series are given with one term missing as shown by (?). Choose the missing term out of the given alternatives :

 B, D, F, I, L, P, ?

 (A) R

 (B) S

 (C) T

 (D) U

54. I stand with my right hand extended side - ways towards South. Towards which direction will my back be ?

 (A) North

 (B) South

 (C) West

 (D) East

55. Aditya started to walk straight towards West. After walking 10m he turned to the right and walked 6m. After this he turned to the left and walked 10m. Now to which direction Aditya is facing ?

 (A) East

 (B) North

 (C) West

 (D) South

56. Choose the alternative which is closely resembles the mirror image of the given combination of alphabets :

 WHITE

 (A) ƎTIHW

 (B) ƎTIHM

 (C) ƎⱵIHW

 (D) ETIHW
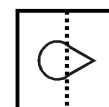
Space for rough work

57. Choose the alternative which is closely resembles the water-image of the given combination of alphabets :

RECRUIT

(A) ⊥I∩ᴚƆƎᴚ

(B) ᴚƎƆᴚ∩I⊥

(C) ᴚƎƆᴚ∩I⊥

(D) ᴚƎƆᴚ∩I⊥

58. If Shubham is standing in line of boys. If he is at 25ᵗʰ place from right end and 25ᵗʰ place from left end also. Then number of boys standing in the row is ?

(A) 48

(B) 50

(C) 49

(D) 51

59. What is the value of given expression by using BODMAS :

$10 + 10 \times 10 \div 10 = ?$

(A) 10

(B) 15

(C) 20

(D) 11

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60. Find out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line :

(X)

(A)

(B)

(C)

(D)

Space for rough work

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