



# MATRIX OLYMPAD

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.





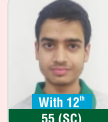


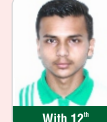


Answer Key and Video Solutions Kindly Scan QR Code and subscribe Matrix youtube channel

# MATRIX: Where producing outstanding results is a habit!

## JEE ADVANCED TOPPERS

 With XII Mayank Soni	AIR <b>26</b> (Gen.)	 With XII Priyanshu Meel	AIR <b>154</b> (Gen.)	 With XII Nagendra Singh	AIR <b>220</b> (Gen.)	 With XII Mohit Modi	AIR <b>296</b> (Gen.)	 With XII Aman Nehra	AIR <b>356</b> (Gen.)	 With XII Himanshu Rewar	AIR <b>358</b> (Gen.)	 With XII Aarish	AIR <b>415</b> (Gen.)	 Uttam Paharia	AIR <b>421</b> (Gen.)
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## JEE MAIN TOPPERS

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

Marks- <b>680</b>  Rekha Nitharwal	AIR <b>1665</b>	Marks- <b>670</b>  Narendra Farroda	AIR <b>2905</b>	Marks- <b>667</b>  Mahendra Yadav	AIR <b>3263</b>	Marks- <b>666</b>  Ankit Kumar Chahar	AIR <b>3378</b>	Marks- <b>665</b>  Deepika Soni	AIR <b>3545</b>	Marks- <b>665</b>  Lokesh Goyal	AIR <b>3621</b>	Marks- <b>665</b>  Mohit Haritwal	AIR <b>3661</b>
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## KVPY TOPPERS

 Manas Jajodia	AIR <b>6</b> (Gen.) Stream- SB	 Ishu	AIR <b>8</b> (Gen.) Stream- SB	 Lakshya	AIR <b>13</b> (Gen.) Stream- SB	 Akshay Choudhary	AIR <b>17</b> (Gen.) Stream- SB	 Chirag Indoria	AIR <b>37</b> (Gen.) Stream- SB
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## STSE TOPPERS

 Aman Nehra	<b>1<sup>st</sup></b> State Rank Class 12 <sup>th</sup>	 Mayank Soni	<b>2<sup>nd</sup></b> State Rank Class 12 <sup>th</sup>	 Dinesh Kumar	<b>2<sup>nd</sup></b> State Rank Class 12 <sup>th</sup>	 Pranshu Bharia	<b>2<sup>nd</sup></b> State Rank Class 10 <sup>th</sup>	 Shrishti	<b>2<sup>nd</sup></b> State Rank Class 10 <sup>th</sup>	 Rohit Yadav	<b>2<sup>nd</sup></b> State Rank Class 10 <sup>th</sup>	 Dev Kumar	<b>3<sup>rd</sup></b> State Rank Class 10 <sup>th</sup>	 Mohd. Farhan	<b>3<sup>rd</sup></b> State Rank Class 10 <sup>th</sup>
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## OUR BOARD TOPPERS

<b>99.20%</b>  Class 10 <sup>th</sup> Pinakin Choudhary	<b>98.80%</b>  Class 10 <sup>th</sup> Aradhya Raina	<b>98.20%</b>  Class 10 <sup>th</sup> Laxmi	<b>98.00%</b>  Class 10 <sup>th</sup> Vishal Choudhary	<b>97.80%</b>  Class 10 <sup>th</sup> Preksha Singh	<b>97.80%</b>  Class 12 <sup>th</sup> Piyush Sagatani	<b>97.60%</b>  Class 12 <sup>th</sup> Khushee Binwal	<b>97.60%</b>  Class 12 <sup>th</sup> Reena	<b>97.60%</b>  Class 12 <sup>th</sup> Siddhant Lalpuria	<b>97.40%</b>  Class 12 <sup>th</sup> Rohit Yadav
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## NTSE TOPPERS

 Aditya Jhajhria	<b>1<sup>st</sup></b> State Rank	 Nayan Godara	<b>1<sup>st</sup></b> State Rank	 Aman Nehra	<b>1<sup>st</sup></b> State Rank	 Aaditya Pratap	<b>2<sup>nd</sup></b> State Rank	 Mayank Soni	<b>2<sup>nd</sup></b> State Rank	 Aditya Bijarniya	<b>4<sup>th</sup></b> State Rank	 Pragati	<b>5<sup>th</sup></b> State Rank
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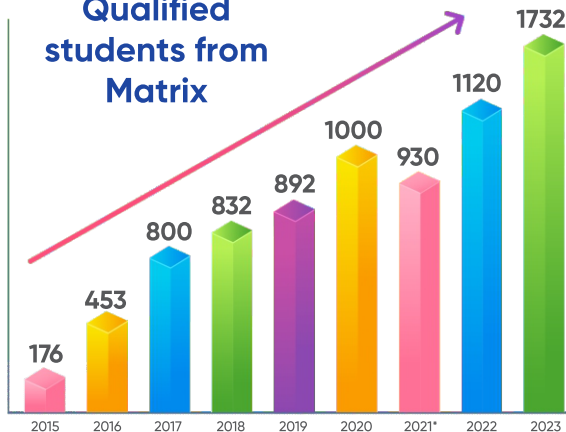
Authenticity of result, promise of Matrix!

\*cumulative result so far

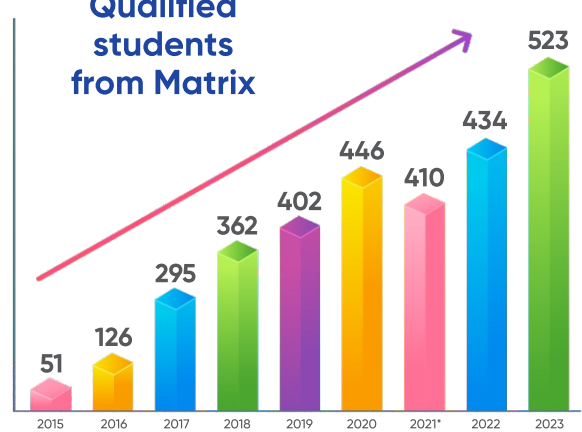
यह परिणाम मैट्रिक्स के केवल Yearlong classroom Program Students का ही है

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

## JEE Main Qualified students from Matrix



## JEE Advanced Qualified students from Matrix



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

\*due to covid

"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

**2023** RESULT

Top score in  
JEE Main 2023  
Mayank Soni

Rank- **34**

Top scorer  
JEE Advanced 2023  
Mayank Soni

AIR- **26** (Gen)

**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

Matrix System has  
produced one of  
the highest  
**NDA**  
selections in Sikar  
at a very early stage.

**70** selections  
in NDA 2023  
April attempt!

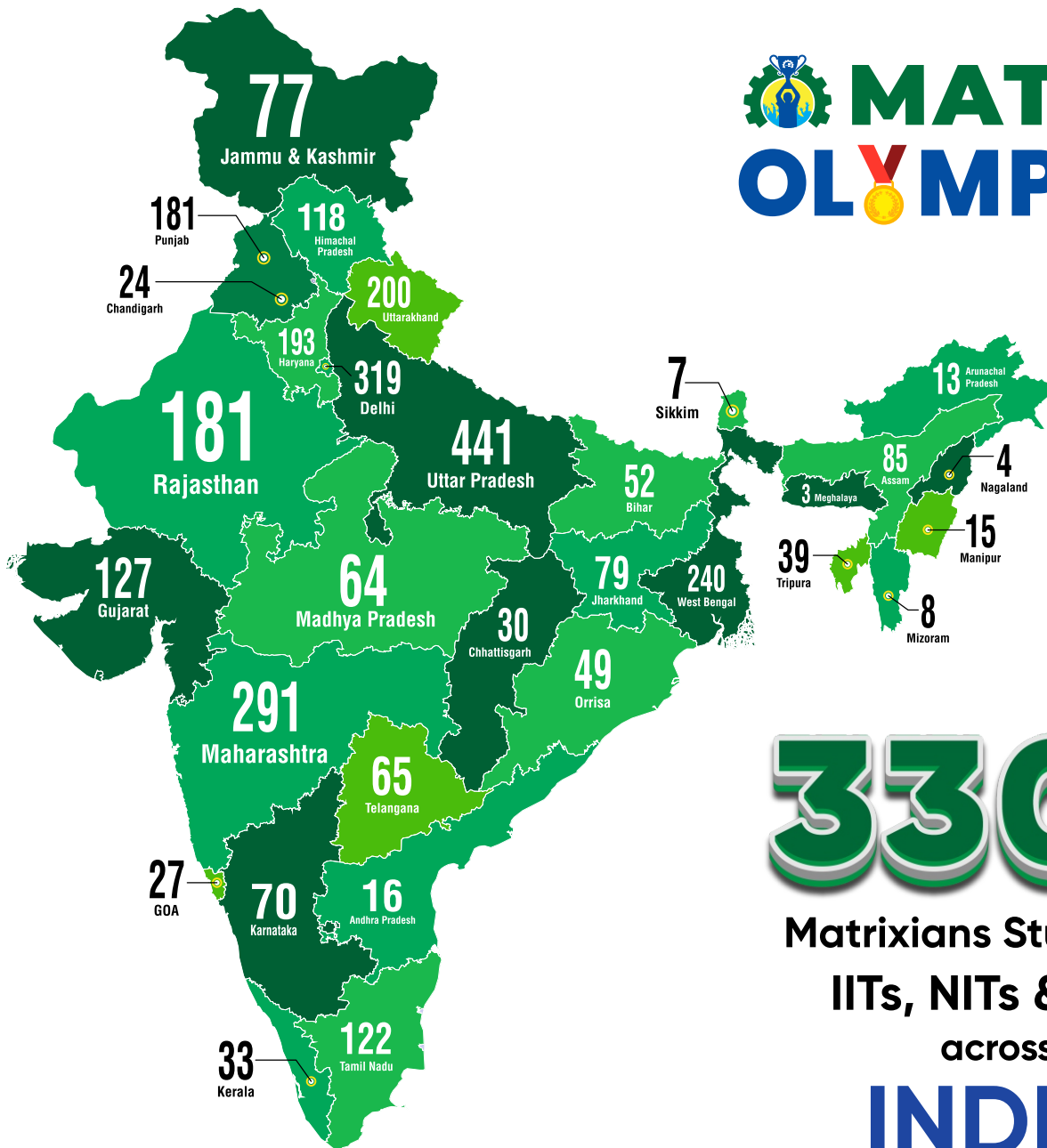
The Most  
**INNOVATIVE  
INSTITUTE** for  
**NEET, JEE &  
Pre-foundation**  
Covering & Serving

**5**  
Major State of  
the Country

Every student  
matters! Every  
student has  
potential!

Highest quality  
of management  
and student care  
for each student





# 3302

Matrixians Studied at  
IITs, NITs & IIITs  
across  
**INDIA**





# 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.

- |  |  |
|--|--|
| <p>1. Which of the following is not a non-contact force?</p> <p>(A) Magnetic force</p> <p>(B) Electrostatic force</p> <p>(C) Gravitational force</p> <p>(D) Friction force</p> <p>2. The force applied on an object of mass 20g produces an acceleration of <math>0.2 \text{ cm s}^{-2}</math>. The magnitude of force applied will be -</p> <p>(A) <math>20 \times 10^{-5} \text{ dyne}</math></p> <p>(B) 4 N</p> <p>(C) 4 dyne</p> <p>(D) <math>4 \times 10^{-4} \text{ N}</math></p> <p>3. A body floats in water with 40% of its volume remains outside water. When the same body floats in oil 60% of its volume remains outside oil. The relative density of oil is-</p> <p>(A) 1.3</p> <p>(B) 0.9</p> <p>(C) 1.8</p> <p>(D) 1.5</p> | <p>4. The force of friction on an object in a fluid doesn't depends on -</p> <p>(A) Nature of fluid</p> <p>(B) The mass of the object</p> <p>(C) Shape of the moving object</p> <p>(D) Speed of the moving object with respect to the fluid</p> <p>5. Which of the following statement/s is/are <b>True(T)</b> or <b>False(F)</b> ?</p> <p>(i) Friction opposes the relative motion between the surfaces in contact.</p> <p>(ii) Sprinkling of powder on the carom board increases friction.</p> <p>(iii) Sliding friction is always greater than rolling friction.</p> <p><b>Code :</b></p> <p>(i) (ii) (iii)</p> <p>(A) T F T</p> <p>(B) T T T</p> <p>(C) F F T</p> <p>(D) F T F</p> |
|--|--|

Space for rough work

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

Column – I	Column – II
P. Pressure	1. newton
Q. Weight	2. $\text{gcm s}^{-2}$
R. Dyne	3. pascal

**Code :**

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

7. Ram and Shyam while returning from school saw a labour pushing hard to move a heavy box. Ram immediately ran to him and started helping him in pushing the box where as Shyam brought two iron bars and asked the labour to put them below the box and then to push the box.



Based on the above diagram and observations we can say that -

- (A) Box will move easily after putting the iron bars below the box  
(B) Sliding friction is less than the rolling friction  
(C) Iron rods below the box increases the friction offered by ground  
(D) More force will be required to push the box after putting the iron bars below the box.

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## 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. A metal dissolved in mercury is called a/an :

- (A) Suspension
- (B) Amalgam
- (C) Emulsion
- (D) Solution

9. Metal which does not react even with steam is :

- (A) Potassium
- (C) Magnesium
- (B) Iron
- (D) Silver

10. Which of the following is a natural polymer -

- (A) Cellulose
- (B) Nylon
- (C) Teflon
- (D) Terylene

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

- (i) Copper is present above iron in the reactivity series.
- (ii) Displacement reactions are shown by all the elements.
- (iii) Zinc is less reactive than iron.

**Code :**

(i) (ii) (iii)

- (A) T F F
- (B) T T T
- (C) F F T
- (D) F F F

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

Column – I	Column – II
P. Polythene	1. Plastic cups
Q. PVC	2. Bags for food storage
R. Polystyrene	3. Raincoats, seats covers

**Code :**

- |     |          |          |          |
|-----|----------|----------|----------|
|     | <b>P</b> | <b>Q</b> | <b>R</b> |
| (A) | 2        | 1        | 3        |
| (B) | 3        | 1        | 2        |
| (C) | 3        | 2        | 1        |
| (D) | 2        | 3        | 1        |

Space for rough work

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13. Synthetic polymers have become an integral part of our lives. They are replacing metals, wood and natural fibres due to their durability and less wear and tear. Synthetic polymers are non-bio-degradable i.e., they are not decomposed in nature by microorganisms, hence cause pollution. The advantages of synthetic polymers are far more than their disadvantages. With careful use, they can be a boon to mankind. Manufacturing synthetic fibres is actually helping conservation of forests because-
- (A) Synthetic fibres use chemicals while the natural fibres require raw materials from plants and animals.
  - (B) The chemicals used in synthetic fibres are available in the forests.
  - (C) The factories to produce synthetic fibres can not be set up in the forest.
  - (D) None of these

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*Space for rough work*

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# 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. Which one of the following is not produced by the process of fermentation ?

- (A) Cheese
- (B) Wine
- (C) Yoghurt
- (D) Milk

15. Which of the following should be used by a farmer with a large farm to harvest his crops quickly and efficiently ?

- (A) Combine
- (B) Winnowing machine
- (C) Sickle
- (D) Seed drill

16. Name the fungus that is commonly used in bakery and beverage industries is \_\_\_\_\_.

- (A) Penicillium
- (B) Yeast
- (C) Agaricus
- (D) Rhizopus

17. Weeds are controlled by chemicals called \_\_\_\_\_.

- (A) Pesticides
- (B) Fungicides
- (C) Weedicides
- (D) Insecticides

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

- (i) Manure is inorganic substance.
- (ii) The process of loosening and turning the soil is known as threshing.
- (iii) Groundnut is harvested in sep-oct month.

**Code :**

(i) (ii) (iii)

- (A) T F T
- (B) T T T
- (C) F F T
- (D) F T F

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

Column – I	Column – II
P. Blue green algae	1. Saprophytes
Q. Rhizobium	2. Cyanobacteria
R. Fungus	3. Nitrogen fixation

**Code :**

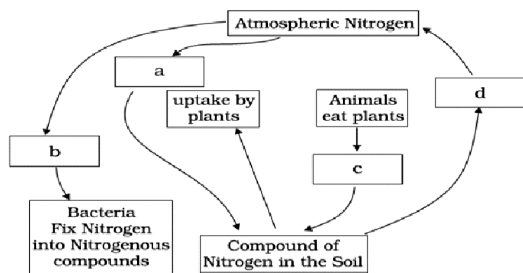
P	Q	R
(A) 2	1	3
(B) 3	1	2
(C) 3	2	1
(D) 2	3	1

Space for rough work

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D08291023

20. The diagram represents nitrogen cycle is a bio-geochemical process through which nitrogen is converted into many forms, consecutively passing from the atmosphere to the soil to organism and back into the atmosphere.



Select out the correct option for b and a.

- (A) Blue Green Algae, Lightining
- (B) Spirogyra , Nitrification
- (C) Denitrification, Vibrio
- (D) Lightining ,Algae

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*Space for rough work*

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# 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. What should be added to  $-\frac{5}{4}$  to get  $-1$ ?

(A)  $-\frac{1}{4}$

(B)  $\frac{1}{4}$

(C) 1

(D)  $-\frac{3}{4}$

22. Which of the following is the reciprocal of the reciprocal of a rational number?

(A)  $-1$

(B) 1

(C) 0

(D) The number itself

23. Name the property under multiplication used

in  $\frac{-1}{5} \times 1 = 1 \times \frac{-1}{5} = \frac{-1}{5}$ .

(A) Associative property

(B) Multiplicative identity

(C) Additive identity

(D) None of these

24. Solve for  $x$  :  $5x + \frac{7}{2} = \frac{3}{2}x - 14$

(A)  $-3$

(B)  $-5$

(C)  $-4$

(D)  $-2$

25. The digits of a two-digit number differ by 3. If the digits are interchanged and the resulting number is added to the original number, we get 143. What can be the original number ?

(A) 36

(B) 76

(C) 85

(D) 59

26. If  $a$  and  $b$  are positive integers, then the solution of the equation  $ax = b$  has to be always:

(A) Positive

(B) Negative

(C) One

(D) Zero

27. What is the maximum number of obtuse angles that a quadrilateral can have ?

(A) 1

(B) 2

(C) 3

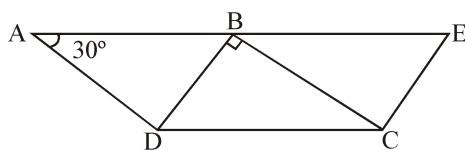
(D) 4

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28. In the given figure, ABCD and BDCE are parallelograms with common base DC. If  $BC \perp BD$ , then  $\angle BEC = ?$



- (A)  $60^\circ$   
 (B)  $30^\circ$   
 (C)  $150^\circ$   
 (D)  $120^\circ$
29. Two adjacent angles of a parallelogram are in the ratio 1:5. Then all the angles of the parallelogram are:  
 (A)  $30^\circ, 150^\circ, 30^\circ, 150^\circ$   
 (B)  $85^\circ, 95^\circ, 85^\circ, 95^\circ$   
 (C)  $45^\circ, 135^\circ, 45^\circ, 135^\circ$   
 (D)  $30^\circ, 180^\circ, 30^\circ, 180^\circ$
30. For calculation of interest compounded half yearly, keeping the principal same, which one of the following is true.  
 (A) Double the given annual rate and half the given number of years.  
 (B) Double the given annual rate as well as the given number of years.  
 (C) Half the given annual rate as well as the given number of years.  
 (D) Half the given annual rate and double the given number of years.

31. Radhika bought a car for Rs 2,50,000. Next year its price decreased by 10% and further next year it decreased by 12%. In the two years overall decrease percent in the price of the car is :  
 (A) 3.2%  
 (B) 22%  
 (C) 20.8%  
 (D) 8%
32. A bought a tape recorder for Rs 8,000 and sold it to B. B in turn sold it to C, each earning a profit of 20%. Which of the following is true:  
 (A) A and B earn the same profit  
 (B) A earns more profit than B  
 (C) A earns less profit than B  
 (D) Cannot be decided
33. Given that  $\sqrt{5625} = 75$ , the value of  $\sqrt{0.5625} + \sqrt{56.25}$  is:  
 (A) 82.5  
 (B) 0.75  
 (C) 8.25  
 (D) 75.0
34. The hypotenuse of a right triangle with its legs of lengths  $3x \times 4x$  is:  
 (A)  $5x$   
 (B)  $7x$   
 (C)  $16x$   
 (D)  $25x$

Space for rough work

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35. Square roots of  $\frac{0.081}{0.0064} \times \frac{0.484}{6.25} \times \frac{2.5}{12.1}$  is :

- (A) 0.45
- (B) 0.75
- (C) 0.95
- (D) 0.99

36.  $\sqrt[3]{3\left(\sqrt[3]{x} - \frac{1}{\sqrt[3]{x}}\right)} = 2$  then  $\sqrt[3]{x} + \frac{1}{\sqrt[3]{x}} =$

- (A)  $\frac{3}{15}$
- (B)  $-\frac{10}{3}$
- (C)  $\frac{10}{3}$
- (D) Both (B) and (C)

37. The length of each side of a cubical box is 2.4 m. Its volume is \_\_\_\_\_

- (A) 13.824 cu. cm
- (B)  $1.3824 \times 10^7$  cu. cm
- (C)  $1.3824 \times 10^6$  cu. cm
- (D)  $13.824 \times 10^4$  cu. cm

38. Monthly salary of a person is Rs.15000. The central angle of the sector representing his expenses on food and house rent on a pie chart is  $60^\circ$ . The amount he spends on food and house rent is:

- (A) Rs. 5000
- (B) Rs. 2500
- (C) Rs. 6000
- (D) Rs. 9000

39. Ram put some buttons on the table. There were 4 blue, 7 red, 3 black and 6 white buttons in all. All of a sudden, a cat jumped on the table and knocked out one button on the floor. What is the probability that the button on the floor is blue?

- (A)  $\frac{7}{10}$
- (B)  $\frac{3}{5}$
- (C)  $\frac{1}{5}$
- (D)  $\frac{1}{4}$

40. The ages of 50 members of the Junior cricket club in a town are as given below. 15, 17, 14, 13, 14, 13, 14, 17, 17, 16, 17, 16, 15, 16, 15, 14, 13, 14, 15, 13, 18, 13, 15, 14, 15, 13, 14, 13, 13, 17, 15, 14, 14, 17, 16, 17, 15, 14, 17, 16, 16, 16, 14, 16, 13, 18, 16, 15, 14, 14.

What percentage of members is in the 15-16 age group?

- (A) 28%
- (B) 30%
- (C) 32%
- (D) 36%

Space for rough work

\*\*\*\*\* D08291023 \*\*\*\*\*

D08291023



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

- (i) If  $x + y = 0$ , then  $(-y)$  is known as the negative of  $x$ , where  $x$  and  $y$  are rational numbers.
- (ii) Rational numbers are closed under addition and multiplication but not under subtraction.
- (iii) If  $\frac{r}{s}$  is a rational number, then  $s$  cannot be equal to zero.

**Code :**

(i) (ii) (iii)

- (A) T F F
- (B) T T T
- (C) T F T
- (D) F T F

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

- (i) Sum of the ages of Anju and her mother is 65 years. If Anju's present age is  $y$  years then her mother's age before 5 years was  $(60 - y)$  years.
- (ii) 3 years ago, the age of a boy was  $y$  years. His age 2 years ago was  $(y - 2)$  years.
- (iii) If the sum of two consecutive numbers is 93 and one of them is  $x$ , then the other number is  $93 - x$ .

**Code :**

(i) (ii) (iii)

- (A) T F T
- (B) T T T
- (C) F F T
- (D) F T F

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

- (i) Simple interest on a given amount is always less than or equal to the compound interest on the same amount for the same time period and at the same rate of interest per annum.
- (ii) Three times a number is 200% increase in the number, then one-third of the same number is 200% decrease in the number.
- (iii) Selling price of 9 articles is equal to the cost price of 15 articles. In this transaction there is profit of  $66\frac{2}{3}\%$ .

**Code :**

(i) (ii) (iii)

- (A) T F F
- (B) T F T
- (C) F F T
- (D) F T F

Space for rough work

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44. Match **Column – I** (Number of Independent Measure required) with **Column – II** (To construct a quadrilateral) and select the correct answer using the codes given below.

Column – I	Column – II
------------	-------------

- |          |                  |
|----------|------------------|
| P. Two   | 1. Square        |
| Q. Three | 2. Rectangle     |
| R. One   | 3. Parallelogram |

Code :

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

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

Column – I	Column – II
------------	-------------

- |                              |            |
|------------------------------|------------|
| P. $(7x)^2 > 441$            | 1. $x = 1$ |
| Q. $(3^x)^3 = 729$           | 2. $x > 3$ |
| R. $5^{x^2} = \sqrt[3]{125}$ | 3. $x = 2$ |

Code :

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

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

Column – I	Column – II
------------	-------------

- |                             |                       |
|-----------------------------|-----------------------|
| P. 12,14,13,12,14, 12,14,12 | 1. Mode is un-defined |
| Q. 14,13,12,12,13, 14,14    | 2. Median is 13       |
| R. 11,12,13,14              | 3. Mode is 12         |

Code :

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

### Paragraph for Questions 47 & 48

It is common that government revises fares from time to time based on various factors such as taxes economy and inflation, for various vehicles like auto-rickshaw, taxis and radio cab etc. The auto and Taxi charge in a city comprise of fixed charge and the charge for the distance covered. Few situations are given below in the form questions. Find the correct option.

Space for rough work

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47. If the fixed charge in a city is Rs.x and charge per km is Rs.5 and total fare is Rs.60, then the linear equation for the journey of 10 km.

(A)  $x + 50 = 60$   
 (B)  $x - 50 = 60$   
 (C)  $x + 50 = 50$   
 (D) None of these

48. If the fixed charge in a city is Rs.x and charge per km is Rs.5 and total fare is Rs.60, what is the value of fixed charge ?

(A) Rs. 20  
 (B) Rs. 5  
 (C) Rs. 10  
 (D) Rs. 15

**Paragraph for Questions 49 & 50**

If  $V_0$  is the value of an article at certain time which increases at the rate of  $R_1$  for first  $n_1$  years and decreases at the rate of  $R_2$  for next  $n_2$  years, then the value of the article  $V$  at the end of  $(n_1 + n_2)$  years is given by

$$V = V_0 \left( 1 + \frac{R_1}{100} \right)^{n_1} \left( 1 - \frac{R_2}{100} \right)^{n_2}$$

49. The production of an article of a company in 2002 was 10000. Due to increase in demand, the company increased its production by 20% in the next 2 years. After 2 years due to decrease in the demand, the company decreased its production by 10% in the next year, then the production after 3 years is :

(A) 12950  
 (B) 12000  
 (C) 12900  
 (D) 12960

50. Population of Chhapra district was 200000 on the last day of the year 2005. During next year is increased by 5% but due to an epidemic it decreased by 2% in the following year, then the population at the end of the year 2007 is :

(A) 205000  
 (B) 205800  
 (C) 206000  
 (D) 205700

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*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. 24, 12, 12, 18, ?, 90

- (A) 40
- (B) 38
- (C) 36
- (D) 45

52. 3, 2, 3, 6, ?, 37.5, 115.5

- (A) 11
- (B) 3
- (C) 6
- (D) 14

53. Deepa moved a distance of 75 metres towards the North. She then turned to the left and walking for about 25 metres, turned left again and walked 80 metres. Finally, she turned to the right at an angle of  $45^\circ$ . In which direction was she moving finally ?

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

54. Madhuri travels 14 km Westwards. Then she turns left and travels 6 km and further turns left and travels 26 km. How far is Madhuri now from the starting point ?

- (A)  $6\sqrt{5}$  km
- (B)  $\sqrt{200}$  km
- (C)  $\sqrt{100}$  km
- (D) None of these

55. Rajan is 6<sup>th</sup> place from the left end and Vinay is 10<sup>th</sup> place from the right end in a row of boys. If there are eight boys between Rajan and Vinay. So how many maximum boys are there in the row ?

- (A) 23
- (B) 24
- (C) 25
- (D) 26

56. 38 girls are sitting in a row facing North. Taruna sits 10<sup>th</sup> place from the right and Tripti sits 15<sup>th</sup> place from the left. How many girls are sitting between Taruna and Tripti?

- (A) 13
- (B) 25
- (C) 17
- (D) 15

Space for rough work

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57. In a row of 68 people, Sonal is at 22<sup>nd</sup> place from the left end and Neha is at 17<sup>th</sup> place from the right end. Counting from the left end, what will be the position of Lalita who is sitting exactly in the middle of Sonal and Neha ?
- (A) 27<sup>th</sup>  
(B) 41<sup>st</sup>  
(C) 37<sup>th</sup>  
(D) 34<sup>th</sup>

58. In the following question, choose the correct mirror image from given for alternatives.

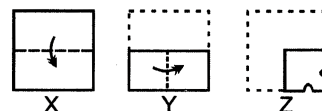


- (A)
- (B)
- (C)
- (D)

59. If the given interchanges namely : signs + and ÷ and numbers 2 and 4 are made in signs and numbers, which one of the following four equations would be correct ?

- (A)  $2 + 4 \div 3 = 3$   
(B)  $2 + 4 \div 6 = 8$   
(C)  $4 \div 2 + 3 = 4$   
(D)  $4 + 2 \div 6 = 1.5$

60. A sheet has been folded in the manner as shown in X, Y and Z respectively and punched. You have to choose from the alternatives how it will look when unfolded :



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

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Space for rough work

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