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

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 fundamental physical quantity ?

(A) Electric current

(B) Time

(C) Mass

(D) Electric charge

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

(A) The Sun

(B) The Moon

(C) The Earth

(D) The Planets

3. The prefix deca is used for-

(A) 10^{-1}

(B) 10^{1}

(C) 10^{2}

(D) 10^{-2}

4. Ram has a solid ball, a torch and an opaque. He forms a shadow of the ball on the opaque screen as shown in figure below and observes the shape and size of shadow of the ball. According to his observation, shape and size of the shadow doesn't depends on _____.
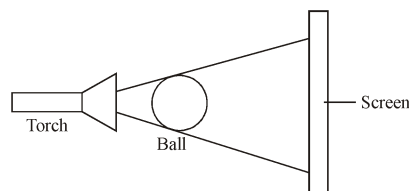
(A) Position of the opaque screen

(B) Position of the object

(C) Shape and size of the ball

(D) The colour of the ball

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

(i) Light is not a form of energy.

(ii) Light ray always travels in a straight line, known as rectilinear propagation of light.

(iii) Laws of reflection holds for all type of reflecting surfaces.

Code :

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

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

Column – I	Column – II
P. Transparent	**1.** Candle
Q. Artificial source of light	**2.** Butter paper
R. Translucent	**3.** Thin layer of water

Code :

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

7. One day Jaadu and Rohit were observing the wall clock at their home. They were trying to understand the motion of the hands of the clock.
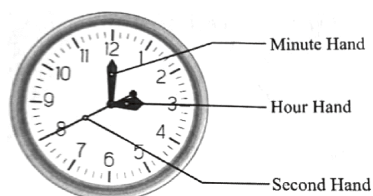
Based on the above diagram, the motion of the minute hand of the wall clock observed by Jaadu and Rohit was _____ motion.

(A) Only circular

(B) Only periodic

(C) Circular as well as periodic

(D) Neither circular nor periodic

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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. The correct sequence to get cloth is :
(A) Fibre $\rightarrow$ Fabric $\rightarrow$ Yarn
(B) Fibre $\rightarrow$ Yarn $\rightarrow$ Fabric
(C) Fabric $\rightarrow$ Yarn $\rightarrow$ Fibre
(D) Yarn $\rightarrow$ Fibre $\rightarrow$ Fabric

9. The process of making yarn from fibres is called _____ .
(A) Weaving (B) Spinning
(C) Ginning (D) Knitting

10. Which property of a material decides whether it sinks or floats in water ?
(A) Rigidity (B) Hardness
(C) Solubility (D) Density

11. Which of the following statement/s is/are **True(T)** or **False(F)** ?
(i) Fabrics are made from yarns by ginning and spinning processes.
(ii) In weaving a single yarn is used to make a piece of fabric.
(iii) Polyester, Nylon and Acrylic are all synthetic fibres.
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. Soluble in water	**1.** A piece of wood
Q. Transparent	**2.** Wind screen of car
R. Float in water	**3.** Cane sugar

Code :

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

13. The sorting of objects into groups with each group having its own characteristic properties is called classification. All the objects having similar characteristic properties are placed in one group and the objects having different properties are placed in different groups.
The purpose of classifying objects into groups is to -
(A) Study their properties
(B) Locate them easily
(C) Observe similarities
(D) All of them

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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. What is added to milk to make curd ?

(A) Virus

(B) Fungi

(C) Lemon

(D) Bacteria

15. Which of the following stems are edible ?

(A) Ginger, Onion, Potato

(B) Carrot, Radish, Pumpkin

(C) Carrot, Ginger, Onion

(D) Onion, Potato, Tomato

16. Study the following food chain. What is wrongly depicted in this food chain ?

Plants → Grasshopper → Frog → Snake → Eagle

(A) Snake eating frog

(B) Frog eating grasshopper

(C) Snake eating eagle

(D) Eagle eating snake

17. Which of the following vitamins and their deficiency disease is not correctly paired ?

(A) Vitamin A → Night blindness

(B) Vitamin B_1 → Scurvy

(C) Vitamin B_{12} → Anaemia

(D) Vitamin D → Rickets

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

(i) Protective foods are vitamins and minerals.

(ii) Carbohydrates are the main sources of energy in our diet.

(iii) Deficiency of vitamin A makes our bone weak.

Code :

	(i)	(ii)	(iii)
(A)	T	F	F
(B)	T	T	F
(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. Roots	**1.** Tomato, Brinjal
Q. Stems	**2.** Carrot, Turnip
R. Fruits	**3.** Banana, Potato

Code :

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

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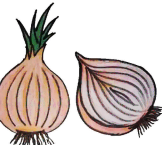
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20. Plants shows adaptation to survive in different habitats. They have modifications in different parts based on their requirements. The most common type of modifications are that of root, stem and leaf.

Which one of the following does not belong to the group formed by the others ?

(A) Ginger

(B) Potato

(C) Onion

(D) Carrot

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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. The digits 5 and 8 are interchanged in the number $1, 80, 025$. Find the difference between these two numbers.
(A) 29996
(B) 29995
(C) 29997
(D) 29990

22. Number of boys in a class are 25 and number of girls are 24. Find the total strength of the class in roman numerals.
(A) XLVI
(B) XLX
(C) XLV
(D) XLIX

23. 79574833 is separated by comma's and written in word as :
(A) $79, 574, 833$ (Seventy nine crore five lakh seventy four thousand eight hundred thirty three)
(B) $7, 95, 74, 833$ (Seven crore ninety five lakh seventy four thousand eight hundred thirty three)
(C) $79, 57, 4833$ (Seventy nine crore fifty seven thousand four hundred thirty three)
(D) $7, 957, 48, 33$ (Seven crore nine fifty seven thousand forty eight hundred thirty three)

24. If $3 \times 10000 + 4 \times 1000 + 4 \times 100$ is the expanded form of a number, then the number will be :
(A) 30440
(B) 34000
(C) 34400
(D) 34444

25. Which of the following statement is not true ?
(A) Both addition and multiplication are associative for whole numbers.
(B) Zero is the multiplicative identity for whole numbers.
(C) Addition and multiplication both are commutative for whole numbers.
(D) Multiplication is distributive over addition for whole numbers.

26. The predecessor of whole number 1 is :
(A) 2
(B) 9
(C) 0
(D) Does not exist

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27. Which of the following number line represents 4 + 5 ?

(A)

(B)

(C)

(D)
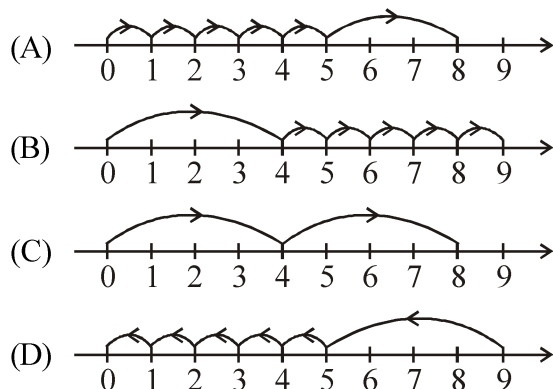
28. The value of $400 \times 4 \times 3 \times 10 \times 0$ is :

(A) 4800

(B) 48000

(C) 16000

(D) 0

29. The HCF of two numbers =

(A) Product of two numbers + their LCM

(B) Product of two numbers – their LCM

(C) Product of two numbers × their LCM

(D) Product of two numbers ÷ their LCM

30. The greatest number that exactly divides 81 and 153 is :
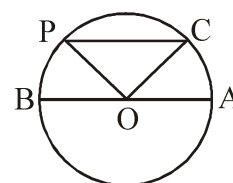
(A) 3

(B) 10

(C) 9

(D) 11

31. There are 207 white balls and 115 blue balls. These balls are to be arranged in buckets containing the same number of balls. Then the greatest number of balls possible in each bucket is :

(A) 23

(B) 18

(C) 28

(D) 217

32. The reciprocal of the smallest prime number is :

(A) 0

(B) 2

(C) 1

(D) $\dfrac{1}{2}$

33. In the given figure, O is the centre of the circle.

Name all the possible chords of the circle.

(A) (PC, OC)

(B) (CP, OP)

(C) (PC, AB)

(D) (OB, OA)

Space for rough work

34. Which of the following is not true about square ?

(A) It is a parallelogram with all angles and all sides are equal.

(B) Diagonals of square are not equal.

(C) Sides of square are equal.

(D) Opposite sides of square are parallel.

35. If two lines l and m are perpendicular to each other, then the measure of the angle between them is :

(A) 10°

(B) 50°

(C) 40°

(D) 90°

36. The number of faces in the given figure is :
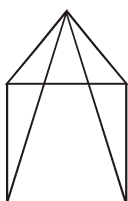
(A) 2

(B) 4

(C) 5

(D) 3

37. Add (–345) and 428, then subtract 960 from the result. The answer will be :

(A) –877

(B) 877

(C) –536

(D) 536

38. Solve : $1 - 2 + 3 - 4 + 5 - 6 + 7 - 8$ .... $+ 17 - 18 + 19 - 20$.

(A) –10

(B) 100

(C) 10

(D) –100

39. A tanker contains 500 litres of water. Due to a small hole in the tanker, the quantity of water is decreasing at the rate of 9 litres per hour. What will be the quantity of water left in the tank (in litres) after 10 hours ?

(A) 410

(B) 491

(C) 400

(D) 90

40. The value of $[(-4) \times (-9) \times (-25)] \div [(-2) \times (-3) \times (-5)]$ is :

(A) 10

(B) 20

(C) 30

(D) 40

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

(i) Every whole number is a natural number.

(ii) Every natural number is a whole number.

(iii) Every whole number is an integer.

Code :

	(i)	(ii)	(iii)
(A)	T	F	F
(B)	F	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) Distributive property shows :

$3 + (2 \times 3) = (3 + 2) \times (3 + 3)$.

(ii) Associative property shows :

$(6 \times 5) \times 7 = 6 \times (5 \times 7)$.

(iii) Commutative property shows :

$4 + 5 \neq 5 + 4$.

Code :

	(i)	(ii)	(iii)
(A)	T	F	F
(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) −8 is to the right of −10 on a number line.

(ii) −100 is the greatest negative integer.

(iii) −26 is greater than −25.

Code :

	(i)	(ii)	(iii)
(A)	T	F	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. $-45632 - (-35632)$	**1.** −1427
Q. $\{-380 - (675)\} - \{865 + (-493)\}$	**2.** 82
R. $(-516) + \{(-327) - (-925)\}$	**3.** −10000

Code :

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

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

Column – I	Column – II
P.	**1.** Hexagon
Q.	**2.** Octagon
R.	**3.** Pentagon

Code :

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

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

Column – I	Column – II
P. 8622	**1.** Divisible by 6
Q. 2002	**2.** Divisible by 4
R. 8864	**3.** Divisible by 11

Code :

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

Paragraph for Questions 47 & 48

Symbol	L	C	D	M	I	X
Value	50	100	500	1000	1	10

First Rule : Numerals of the same value are added.

Second Rule : A symbol of smaller value put on the right of greater value symbol is added to it.

Third Rule : A symbol of smaller value put on the left of greater value symbol is subtracted from it.

Fourth Rule : A symbol of smaller value, put between two symbols of greater value is subtracted from the symbol on its right.

47. Find the sum of LX and XC.

(A) 160

(B) 150

(C) 140

(D) 130

48. What is the roman numeral of 70 ?

(A) XXL

(B) XXC

(C) CXX

(D) LXX

Space for rough work

Paragraph for Questions 49 & 50

During a week in the month of december, Shimla recorded the following temperatures : –3ºC, –6ºC, 1ºC, –4ºC, 0ºC and 9ºC.

49. The difference between the highest and lowest temperature during a week was :

(A) 11ºC

(B) 15ºC

(C) 13ºC

(D) 10ºC

50. The lowest temperature recorded in Shimla is :

(A) –3º C

(B) 1º C

(C) 0º C

(D) –6º C

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

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 – 53) : *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, 9, 25, 49, ?, 121

(A) 64

(B) 81

(C) 91

(D) 100

52. 11, 13, 17, 19, 23, 29, ?

(A) 35

(B) 33

(C) 31

(D) 37

53. 120, 99, 80, 63, 48, ?

(A) 35

(B) 38

(C) 39

(D) 40

54. One morning Sujata started to walk towards the sun. After covering some distance she turned to right and covering some distance. She again turns to the right. Now in which direction is she facing ?

(A) North

(B) South

(C) North-East

(D) West

55. Ram started to walk straight towards South. After walking 5m he turned to the left and walked 3m. After this he turned to the right and walked 5m. Now in which direction Ram is facing ?

(A) North-East

(B) South

(C) North

(D) South-West

56. Choose the alternative, which closely resembles the mirror - image of the given combination :

BRISK

(A) ꓘƧIЯꓭ

(B) ꓘƧIЯꓭ

(C) ꓘƧIЯꓭ

(D) ꓘƧIЯꓭ

Space for rough work

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

A1M3b
||||||||||||||||||||

(A) ∀ꓕM3ꟼ

(B) ∀ꓕM3ꟼ

(C) ∀ꓕMƐꟼ

(D) ꟼꓕMƐ∀

58. Rakesh is on 9ᵗʰ position from upwards and on 38ᵗʰ position from downwards in a class. How many students are in the class ?

(A) 47

(B) 45

(C) 46

(D) 48

59. Find the value of given expression by using BODMAS :

$4(10 + 15 \div 5 \times 4 - 2 \times 2)$

(A) 72

(B) 64

(C) 84

(D) 52

60. Find out 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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