



# MSAT – 2025

(MAHARISHI SCHOLARSHIP CUM ADMISSION TEST)

## Class – 10<sup>th</sup> going to 11<sup>th</sup> (JEE)

### SAMPLE PAPER

**Disclaimer:** This is a sample paper provided for practice purposes only. The level of difficulty, type of questions, and total number of questions may vary in the actual examination.

Time: 3 Hour

Maximum Marks: 125

#### General Instructions:

- Please read the instructions carefully. You are allotted 5 minutes specifically for this purpose.
- You are not allowed to leave the examination hall before the end of test.
- Do not keep the OMR sheet exposed to others.
- Shade the correct answers only in the OMR sheet given. Do not write or mark answers or symbols (Like ✓, •, X ...) anywhere in the questions paper.
- This booklet is your Question Paper.
- This Question Paper booklet contains 4 Sections. All Section contains Part A.

Section	Subject	Types of Questions	Number of Questions	Marking Scheme
I	MAT	Single Answer Questions	20	+1,0
II	MATHS	Single Answer Questions	15	+3,-1
III	PHYSICS	Single Answer Questions	10	+3,-1
IV	CHEMISTRY	Single Answer Questions	10	+3,-1

#### USEFUL DATA

##### PHYSICS

Acceleration due to gravity	: $g = 10 \text{ m/s}^2$
Planck constant	: $h = 6.6 \times 10^{-34} \text{ J-s}$
Charge of electron	: $e = 1.6 \times 10^{-19} \text{ C}$
Mass of electron	: $m_e = 9.1 \times 10^{-31} \text{ kg}$
Permittivity of free space	: $\epsilon_0 = 8.85 \times 10^{-12} \text{ C}^2 / \text{N-m}^2$
Density of water	: $\rho_{\text{water}} = 10^3 \text{ kg/m}^3$
Atmospheric pressure	: $P_a = 10^5 \text{ N/m}^2$
Gas constant	: $R = 8.314 \text{ J K}^{-1} \text{ mol}^{-1}$

##### CHEMISTRY

Gas Constant	$R =$	$8.314 \text{ J K}^{-1} \text{ mol}^{-1}$
	$=$	$0.0821 \text{ Lit atm K}^{-1} \text{ mol}^{-1}$
	$=$	$1.987 \approx 2 \text{ Cal K}^{-1} \text{ mol}^{-1}$
Avogadro's Number $N_a$	$=$	$6.023 \times 10^{23}$
Planck's constant $h$	$=$	$6.625 \times 10^{-34} \text{ J.s}$
	$=$	$6.625 \times 10^{-27} \text{ erg.s}$
1 Faraday	$=$	$96500 \text{ coulomb}$
1 calorie	$=$	$4.2 \text{ joule}$
1 amu	$=$	$1.66 \times 10^{-27} \text{ kg}$
1 eV	$=$	$1.6 \times 10^{-19} \text{ J}$

Atomic No: H = 1, He = 2, Li = 3, Be = 4, B = 5, C = 6, N = 7, O = 8, F = 9, Ne = 10, Na = 11, Mg = 12, Si = 14, Al = 13, P = 15, S = 16, Cl = 17, Ar = 18, K = 19, Ca = 20, Cr = 24, Mn = 25, Fe = 26, Co = 27, Ni = 28, Cu = 29, Zn = 30, As = 33, Br = 35, Ag = 47, Sn = 50, I = 53, Xe = 54, Ba = 56, Pb = 82, U = 92.

Atomic masses: H = 1, He = 4, Li = 7, Be = 9, B = 11, C = 12, N = 14, O = 16, F = 19, Na = 23, Mg = 24, Si = 28, Al = 27, P = 31, S = 32, Cl = 35.5, K = 39, Ca = 40, Cr = 52, Mn = 55, Fe = 56, Co = 59, Ni = 58.7, Cu = 63.5, Zn = 65.4, As = 75, Br = 80, Ag = 108, Sn = 118.7, I = 127, Xe = 131, Ba = 137, Pb = 207, U = 238.

Name : \_\_\_\_\_

Registration Number : \_\_\_\_\_

**MAT****Section – I****Part – A  
Single Answer Questions**

1. Which of the following diagrams indicates the best relation between Women, Mothers and Engineers ?

(A)



(B)



(C)

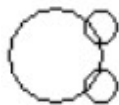


(D)

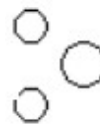


2. Which of the following diagrams indicates the best relation between Haryana, Punjab and Chandigarh ?

(A)



(B)



(C)



(D)



3. Pointing to a gentleman, Abhishek said, "His only brother is the father of my daughter's father. "How is the gentleman related to Abhishek?

(A) Grand father

(B) Father

(C) Brother-in-law

(D) Uncle

4. Pointing to a girl in the photograph, Nitin said, "Her mother's brother is the only son of my mother's father." How is the girl's mother related to Nitin?

(A) Aunt

(B) Mother

(C) Sister

(D) Data inadequate

5. S is the uncle of P, who is the daughter of Q and Q is the daughter-in-law of R. How is S related to R?

(A) Brother

(B) Son-in-law

(C) Son

(D) Data inadequate

6. If 'A \$ B' means A is the brother of B, 'A ≠ B' means B is the father of A and 'A a B' means B is the mother of A, then find out relation which is A is the Grandfather of B.

(A) B \$ C a D ≠ A

(B) A ≠ D \$ C a B

(C) B ≠ C \$ D a A

(D) None of these

7. In the row of boys facing North, Arun is 12<sup>th</sup> from left and Vijay is 18<sup>th</sup> from the right. After interchanging their places Vijay found himself seated 7 places to the left of Suresh, who was 9<sup>th</sup> towards his left before interchanging. How many boys are there in the row?

(A) 23

(B) 24

(C) 45

(D) 46

8. In a class of 60, where girls are twice that of boys, Kamal ranked seventeenth from the top. If there are 9 girls ahead of Kamal, how many boys are after him in rank ?

(A) 3

(B) 7

(C) 12

(D) 13

9. Find the appropriate option that fit in blank 24 : 864 :: 35 : .....

(A) 9125

(B) 1020

(C) 1010

(D) 925

10. Find the appropriate option that fit in blank 45 : 24: 30 :: 76: .....

(A) 42, 36

(B) 72, 67

(C) 66, 30

(D) 42, 30

11. Find the missing number in the series 13, 41, 85, 145, ?  
(A) 195 (B) 221 (C) 235 (D) 258
12. Find the next number 6, 20, 56, 176, \_?  
(A) 416 (B) 525 (C) 256 (D) 384
13. Find the missing number in the series....., 98, 292, 1166, 5828?  
(A) 45 (B) 50 (C) 55 (D) 10
14. Find the next missing number 12, 18, 36, 54, 108, \_?  
(A) 90 (B) 162 (C) 216 (D) 196
15. Find the appropriate word that fit in the place of question mark, Malaria : Disease : : Spear : ?  
(A) Wound (B) Sword (C) Weapon (D) Death moderate
16. Find the appropriate word that fit in the place of question mark, Fear : Threat : : Anger : ?  
(A) Compulsion (B) Panic (C) Provocation (D) Force
17. If BOMBAY is written as MYMYMY, how will TAMIL NADU be written in that code?  
(A) TIATITIA (B) IATITAT (C) MNUMNUMNU (D) ALDALDALD
18. In a certain code MUMBAI is coded as 59 and DELHI is coded as 38, How HYDERABAD is written in that code?  
(A) 68 (B) 67 (C) 63 (D) 69

**Directions (Q.No.19 – 20): Read the following information and answer the given questions.**

**Five towns—Kolkata, Chandigarh, Hyderabad, Agra, and Mumbai—which are covered by the same newspaper, all have excellent cricket teams. The teams are named the Royals, the Lions, the Kings, the Devils, and the Bulls. The sports reporter, who has just started at the news paper, has to be careful not to get them confused. Here is what she knows:**

- i. The team in Kolkata has beaten the Kings, Royals, and Devils.
- ii. The Lions have beaten the teams in Mumbai, Hyderabad, and Kolkata.
- iii. The Kings are in Chandigarh.
- iv. The team in Hyderabad is not the Devils.

19. Where are the Lions?  
(A) Kolkata (B) Hyderabad (C) Agra (D) Mumbai
20. Where are the Royals?  
(A) Mumbai (B) Kolkata (C) Chandigarh (D) Hyderabad

## MATHS

## Section – II

### Part – A Single Answer Questions

1. If one root of the equation  $ax^2 + bx + c = 0$  is three times the other, then  $b^2 : ac =$  \_\_\_\_\_  
(A) 3 : 1 (B) 3 : 16 (C) 16 : 3 (D) 16 : 1
2. If the system of equations  $2x+3y = 5$ ,  $4x+ky=10$  has infinitely many solutions, Then  $k =$  \_\_\_\_\_  
(A) 1 (B)  $\frac{1}{2}$  (C) 3 (D) 6
3. A train covers a distance of 90km at a uniform speed. Had the speed been 15km/hour more, it would have taken 30 minutes less for the journey. Find the original speed of the train.  
(A) 30 km/hour (B) 40 km/hour (C) 45 km/hour (D) 60 km/hour

4. For what value of 'k', the equations  $3x - y + 8 = 0$  and  $6x - ky + 16 = 0$  represent coincident lines?  
 (A)  $\frac{1}{2}$  (B)  $-\frac{1}{2}$  (C) 2 (D) -2
5. If the roots of the equation  $(b - c)x^2 + (c - a)x + (a - b) = 0$  are equal, then find  $\frac{a + b + c}{b}$ ?  
 (A) 4 (B) 3 (C) 2 (D) 1
6. If one root of the equation  $4x^2 - 2x + (\lambda - 4) = 0$  be the reciprocal of the other, then  $\lambda =$  \_\_\_\_\_  
 (A) 8 (B) -8 (C) 4 (D) -4
7. If the equation  $x^2 - bx + 1 = 0$  does not possess real roots, then  
 (A)  $-3 < b < 3$  (B)  $-2 < b < 2$  (C)  $b > 2$  (D)  $b < -2$
8. A shopkeeper buys a number of books for Rs. 80. If he had bought 4 more books for the same amount, each book would have cost Rs. 1 less. How many books did he buy?  
 (A) 16 (B) 18 (C) 20 (D) 24
9. Seven years ago Varun's age was five times the square of Swati's age, three years hence Swati's age will be two fifth of Varun's age. Find the present age of Swati  
 (A) 7 years (B) 8 years (C) 9 years (D) 10 years
10. Find the sum of  $\frac{1}{3} + \frac{1}{15} + \frac{1}{35} + \frac{1}{63} + \frac{1}{99} + \frac{1}{143}$   
 (A)  $\frac{9}{13}$  (B)  $\frac{6}{13}$  (C)  $\frac{121}{143}$  (D)  $\frac{7}{11}$
11. The H.C.F. of two expressions is  $x$  and their L.C.M is  $x^3 - 9x$ . If one of the expressions is  $x^2 + 3x$ , then the other expression is  
 (A)  $x^2 - 3x$  (B)  $x^3 - 3x$  (C)  $x^2 + 9x$  (D)  $x^2 - 9x$
12. Real numbers  $a, b, c$  satisfying the equations  $a + b + c = 26$ ,  $\frac{1}{a} + \frac{1}{b} + \frac{1}{c} = 28$  then the value of  $\frac{a}{b} + \frac{b}{c} + \frac{c}{a} + \frac{a}{c} + \frac{c}{b} + \frac{b}{a} =$   
 (A) 735 (B) 625 (C) 728 (D) 725
13. If  $a, b, c \in \mathbb{R}$  and equations  $ax^2 + bx + c = 0$  and  $x^2 + 2x + 9 = 0$  have a common root, then  $a : b : c =$   
 (A) 1 : 2 : 3 (B) 3 : 2 : 5 (C) 1 : 2 : 9 (D) None
14. Ashok has two vessels which contain 720 ml and 405 ml of milk, respectively. Milk in each vessel is poured into glasses of equal capacity to their brim. Find the minimum number of glasses which can be filled with milk.  
 (A) 45 (B) 35 (C) 25 (D) 30
15. For what value of  $k$  do the system of equations  $2x + 3ky = 4$  and  $6x + 27y = 12$  has infinite solutions?  
 (A) 1 (B) 2 (C) 3 (D) 4

## PHYSICS

## Section – III

### Part – A Single Answer Questions

1. The magnification produced by a mirror is  $+1/3$ , then the mirror is a \_\_\_\_\_  
 (A) Concave mirror (B) Convex mirror (C) Plane mirror (D) None of these

2. The field of view is maximum for \_\_\_\_\_  
(A) Plane mirror (B) Concave mirror  
(C) Convex mirror (D) Depends on the size of the object.
3. An object is placed 25cm from a convex lens whose focal length is 10cm. The image distance is \_\_\_\_\_  
(A) 50cm (B) 16.66cm (C) 6.66cm (D) 10cm
4. Which part of the human eye helps in changing the focal length of the eye lens?  
(A) Retina (B) Ciliary muscles (C) pupil (D) Iris
5. A pencil partly immersed in water in a glass tumbler appears to be bent at the interface of air and water. This phenomenon is known as  
(A) Diffraction (B) Reflection (C) Refraction (D) Dispersion
6. Sitting at her home Sita seen the reflection of a picture in the window of the room. If the image of the picture makes an angle of  $60^\circ$  with the normal, at what angle does Sita see the reflected image of the picture  
(A)  $20^\circ$  (B)  $40^\circ$  (C)  $50^\circ$  (D)  $60^\circ$
7. In the human eye, the screen where the image is formed by the eye lens is known as  
(A) Retina (B) pupil (C) Eye lens (D) Iris
8. A needle placed at 30cm from the lens forms an image on a screen placed 60cm on the other side of the lens. The type of lens used is  
(A) Convex lens (B) Concave lens (C) Convex mirror (D) Concave mirror
9. The sky looks blue on a clear, sunny day because of  
(A) Dispersion of light (B) Scattering of light (C) Reflection of light (D) Refraction of light
10. A person cannot clearly see objects farther than 12m from the eye. The person is suffering from, and the lens used to correct the defect is  
(A) Hypermetropia, convex lens (B) Myopia concave lens  
(C) Presbyopia, cylindrical lens (D) Colour blindness, Plane glass

**CHEMISTRY****Section – IV****Part – A  
Single Answer Questions**

1. In the following reaction,  
 $3Br_2 + 6CO_3^{2-} + 3H_2O \rightarrow 5Br^- + BrO_3^- + 6HCO_3^-$   
(A) Bromine is oxidised, carbonate is reduced (B) Bromine is reduced, carbonate is oxidised  
(C) Bromine is neither reduced nor oxidized (D) Bromine is reduced as well as oxidized
2.  $Cl_2 + H_2S \longrightarrow 2HCl + S$  In the above reaction, oxidation state of chlorine changes from:  
(A) Zero to -1 (B) 1 to zero (C) Zero to 1 (D) Remains unchanged
3. In the reaction,  $2Na_2S_2O_3 + I_2 \longrightarrow Na_2S_4O_6 + 2NaI$ ,  $I_2$  acts as  
(A) Reducing agent (B) Oxidising agent  
(C) Oxidising as well as reducing agent (D) None of the above
4. The conjugate base of  $H_2PO_4^-$  is  
(A)  $H_3PO_4$  (B)  $HPO_4^{2-}$  (C)  $PO_4^{3-}$  (D)  $H_3PO_3$

5. Match the compounds given in (X) with their uses in (Y)

COLUMN - I		COLUMN - II	
A	$\text{CaOCl}_2$	1	Fire proof material
B	$\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$	2	Disinfectant
C	Milk of magnesia	3	Washing soda
D	$\text{CaSO}_4 \cdot 1/2\text{H}_2\text{O}$	4	Antacid

(A) 2 3 4 1

(B) 4 2 1 3

(C) 3 1 4 2

(D) 4 1 3 2

6. A metal ion  $\text{M}^{2+}$  loses 3 electrons to form another cation. The oxidation number of the metal in the cation is

(A) +6

(B) -1

(C) +5

(D) -5

7.  $p\text{C}_6\text{H}_{12} + q\text{O}_2 \rightarrow r\text{CO}_2 + s\text{H}_2\text{O}$  Which number, p, q, r and s are needed to balance the equation?

(A) 1696

(B) 1966

(C) 9166

(D) 6196

8. Soda ash is

(A)  $\text{Na}_2\text{CO}_3 \cdot \text{H}_2\text{O}$ (B)  $\text{NaOH}$ (C)  $\text{Na}_2\text{CO}_3$ (D)  $\text{NaHCO}_3$ 

9. 10 ml of 1 M  $\text{H}_2\text{SO}_4$  will completely neutralise

(A) 10 ml of 1 M  $\text{NaOH}$  solution(B) 10 ml of 2 M  $\text{NaOH}$  solution(C) 5 ml of 2 M  $\text{KOH}$  solution(D) 5 ml of 1 M  $\text{Na}_2\text{CO}_3$  solution

10. Which of the following can act both as Bronsted acid and Bronsted base

(A)  $\text{Cl}^-$ (B)  $\text{HCO}_3^-$ (C)  $\text{H}_3\text{O}^+$ (D)  $\text{O}^{2-}$

**Answer key Class – 10 (JEE)****MAT**

1.A	2.D	3.D	4.D	5.D
6.D	7.C	8.C	9.A	10.A
11.B	12.A	13.B	14.B	15.C
16.C	17.C	18.A	19.C	20.D

**MATHS**

1. C	2. D	3. C	4. C	5. B
6. A	7. B	8. A	9. C	10.B
11.A	12.D	13.C	14.C	15.C

**PHYSICS**

1.B	2.C	3.B	4.B	5.C
6.D	7.A	8.A	9.B	10.B

**CHEMISTRY**

1.D	2.A	3.B	4.B	5. A
6.C	7.B	8.C	9.B	10. B