



M.M. 100

TIME 50 MIN.

Name :

Father Name :

Mobile No. :

### IMPORTANT INSTRUCTIONS

1. This booklet contains 50 Questions.
2. All questions are compulsory and carry 2 mark,
3. There will be no negative marking.
4. Immediately fill in the particulars on this page of the Test Booklet with Blue/Black Ball Point Pen. Use of pencil is strictly prohibited.
5. You will not be supplied the Answer-Sheet separately by the invigilator. You must complete the details of *Name* , *Father Name* and *Mobile Number* on the Answer-Sheet carefully, as per detailed instructions supplied by Academy, before you actually start answering the questions, failing which your Answer-Sheet will not be evaluated and you will be awarded 'ZERO' mark.
6. No candidate is allowed to carry any textual material, printed or written, bits of papers, mobile phone, any electronic device, etc., except the I - Card, inside the examination hall/room.
7. Rough work is to be done on the space provided for this purpose in the Test Booklet only. Use of white fluid for correction is not permissible on the Answer Sheet. No rough work is to be done on the Answer-Sheet.
8. On completion of the test, the candidate must hand over the Answer Sheet to the Invigilator on duty in the Room/ Hall; however, the candidates are allowed to take away this Test Booklet with them.



# VIGYAN DHARA

IIT-JEE/NEET/AIIMS

*The Temple of Education*



**SCIENCE****SECTION - A (Single Correct)**

1. Which of the following has cross-linked polymer chains?  
(A) bakelite                      (B) polyester                      (C) PVC                      (D) nylon
2. The element Z burns in air to form an oxide. The aqueous solution of this oxide turns blue litmus to red. The element Z is most likely to be.  
(A) carbon                      (B) calcium                      (C) iron                      (D) magnesium
3. Which of the following are contact forces?  
A. Friction                      B. Gravitational force                      C. Magnetic force                      D. Muscular force  
(A) A and B                      (B) B and C                      (C) A and D                      (D) B and D
4. A spring balance can be used to measure:  
A. Mass of an object                      B. Force acting on an object  
C. Density of an object                      D. Weight of an object  
(A) A and B                      (B) B and C                      (C) B and D                      (D) Only D
5. If the static friction between two surfaces P and Q is measured to be 50N, then the sliding friction between these two surfaces should most likely be:  
(A) 75 N                      (B) 45 N                      (C) 55 N                      (D) 65 N
6. The velocities of sound waves in four media P, Q, R and S are 18,000 km/h, 900 km/h, 0 km/h, and 1200 km/h respectively. Which medium could be a liquid substance?  
(A) P                      (B) Q                      (C) R                      (D) S
7. If plus sign (+) denotes the positive electrode and minus sign (–) denotes the negative electrode, then which of the following statement is correct for an iron spoon to be copper-plated?  
(A) Iron spoon (+), copper plate (–), Iron sulphate electrolyte  
(B) Iron spoon (–), copper plate (+), Iron sulphate electrolyte  
(C) Copper plate (–), Iron spoon (+), copper sulphate electrolyte  
(D) Copper plate (+), Iron spoon (–), Copper sulphate electrolyte

**Space for Rough Work**

**SECTION - B (Comprehension)**

Light and sound is found everywhere. Light and sound waves travel from place to place and can be seen and heard. Light is visible to the human eye and is responsible for the sense of sight. It is a form of energy we can see when it is reflected off the surface of an object. Speed of light in air is approximate  $3 \times 10^8$  m/s while sound travel with a speed of 344 m/s in air.

There are two properties of light. The first property of light is called reflection. Reflection is when light bounces off a surface which then allows the object to be visible to the eye.

The second property of light is called refraction. Refraction is when a ray of light passes from a transparent medium to another transparent medium such as from air to water, it changes speed and the way it bends.

In summary, light and sound is everywhere. Light is a form of energy we can see when it is reflected off the surface of an object. Sound can pass through solids, liquids, and gases. Reflection and refraction are two properties of light. Sound travels through solids much faster than through liquids and gases.

8. Which of the following is a mechanical vibration?  
(A) Sound                      (B) Light                      (C) Water                      (D) Reflection
9. Which of the following best defines refraction.  
(A) Light bounces off a surface which then allows the object to be visible to the eye.  
(B) A ray of light passes from a transparent medium to another transparent medium.  
(C) A ray of light passes from a solid to a gas.  
(D) Light bounces off the surface of the sun.
10. What is main cause of refraction  
(A) Bounces of light on a plane surface  
(B) Change in speed of light from one medium to another medium  
(C) Light is responsible for the sense of sight  
(D) All of these

**Space for Rough Work**

**SECTION - C (Matrix Match)**

11. Match the following:

Column I

a. Sound

b. Pressure

c. Lustureus

d. Thermometer used at High temperature

e. Electric switch

Column II

(i) Bakalite

(ii) Iodine

(iii) Pascal

(iv) dB

(v) Gallium

(vi) PVC

(vii)  $\text{Nm}^{-2}$ 

(A) a(iii, iv), b(vii), c(v), d(i), e(vi)

(B) a(iv), b(iii, vii), c(ii), d(v), e(i)

(C) a(iv), b(vii), c(v), d(ii), e(vi)

(D) a(iii, iv), b(iv), c(v), d(vi), e(i)

**SECTION - D (Assertion-Reason)**

In the following questions, a statement of Assertion (A) is followed by a statement of Reason (R).

- (A) If both Assertion & Reason are true and the Reason is correct explanation of the Assertion, then mark (A).  
 (B) If both Assertion & Reason are true but the Reason is not the correct explanation of the Assertion, then mark (B).  
 (C) If Assertion is true statement but Reason is false, then mark (C).  
 (D) If both Assertion and Reason are false statements, then mark (D).

12. A : A normal human eye can clearly see all the objects beyond a certain minimum distance.

R : The human eye has the ability to adjust the focal length of its lens to certain extent.

13. A : A sharp end point of iron nail exerts more pressure on wood than its other end.

R : Force which opposes the motion of body is friction.

14. A : Pure water do not conduct electricity.

R : Small amount of salt or acid is added to make it conductor.

Space for Rough Work

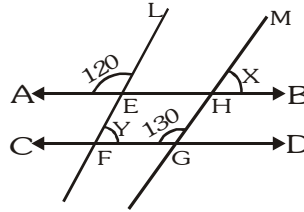
15. Deforestation increases the level of one of the following in the atmosphere. This one is :  
(A) ozone                      (B) carbon dioxide                      (C) oxygen                      (D) water vapour
16. The organelles which provide energy for all the activities of a cell are :  
(A) chloroplasts                      (B) mitochondria                      (C) golgi bodies                      (D) ribosomes
17. The parts which are not present in an animal cell are :  
(A) Cell membrane                      (B) Chloroplast                      (C) Cell wall                      (D) Mitochondria
18. One of the following occurs in the reproductive system of flowering plants as well as that of humans. This is  
(A) sperm ducts                      (B) anther                      (C) ovary                      (D) style
19. Which of the following animal does not show metamorphosis ?  
(A) fish                      (B) frog                      (C) silk moth                      (D) mosquito
20. The dramatic changes in body features associated with puberty are mainly because of the secretions of :  
A. Thyroxine                      B. Estrogen                      C. Adrenaline                      D. Testosterone  
(A) A and B                      (B) B and C                      (C) A and C                      (D) B and D

Space for Rough Work

## MATHEMATICS

### SECTION - A (Single Correct)

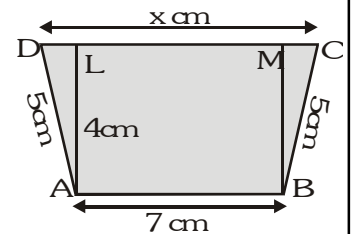
21. In the adjacent figure, AB and CD are parallel lines and L and M intersect them. If L and M are not parallel, what is the value of  $x^\circ + y^\circ$  ?



- (A)  $100^\circ$                       (B)  $110^\circ$                       (C)  $120^\circ$                       (D)  $130^\circ$
22. What is the unit digit in  $7^{105}$ ?
- (A) 1                                  (B) 5                                  (C) 7                                  (D) 9
23. Find cube root of 658, 503
- (A) 77                                  (B) 83                                  (C) 87                                  (D) 89
24.  $\alpha^2 + \beta^2 = ?$
- (A)  $(\alpha + \beta)^2 - 2\alpha\beta$       (B)  $(\alpha + \beta)^2 + 2\alpha\beta$       (C)  $(\alpha + \beta)^2 + 4\alpha\beta$       (D)  $(\alpha + \beta)^2 - 4\alpha\beta$
25. If  $x + y = 5$  and  $x^2 + y^2 = 111$ , then value of  $x^3 + y^3$  is :
- (A) 770                                  (B) 227                                  (C) 555                                  (D) 115
26. By how much is 12% of 24.2 more than 10% of 14.2?
- (A) 14.85                                  (B) 2.762                                  (C) 0.1784                                  (D) 1.484

**Space for Rough Work**

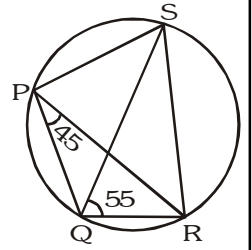
27. A sum of money placed at compound interest doubles it self in 4 yers. It will amount to eight times is :  
 (A) 8 years (B) 16 years (C) 12 years (D) None of these
28. Mean of 11 observations is 17.5, if one observation value 15 is deleted. The mean of remaining observations is :  
 (A) 15.75 (B) 16.75 (C) 17.75 (D) 18.75
29. Image of point (2, 0) about y-axis is :  
 (A) (0, 2) (B) (0, -2) (C) (-2, 0) (D) (0, 0)
30. The number  $\frac{1}{1+\sqrt{5}}$  lies between the numbers :  
 (A)  $\frac{1}{3}$  and  $\frac{1}{2}$  (B)  $\frac{1}{2}$  and  $\frac{1}{\sqrt{2}}$  (C)  $\frac{1}{4}$  and  $\frac{1}{3}$  (D)  $\frac{1}{5}$  and  $\frac{1}{4}$
31. The value of  $\frac{2^{m+3} \times 3^{2m-n} \times 5^{m+n+3} \times 6^{n+1}}{6^{m+1} \times 10^{n+3} \times 15^m}$  is equal to :  
 (A) 0 (B) 1 (C)  $2^m$  (D) None of these
32. If the sum and the product of two numbers are 25 and 144 respectively, then the difference of the numbers must be –  
 (A) 3 (B) 5 (C) 7 (D) 11
33. In the given figure, ABCD is a trapezium in which AB = 7 cm, AD = BC = 5 cm, DC = x cm and the distance between AB and DC is 4 cm then the value of x is :  
 (A) 16 cm  
 (B) 13 cm  
 (C) 19 cm  
 (D) Cannot be determined



Space for Rough Work



34. In figure, PQRS is a cyclic quadrilateral in which PR and QS are its diagonals. If  $\angle RQS = 55^\circ$  and  $\angle QPR = 45^\circ$ , find  $\angle QRS$ .



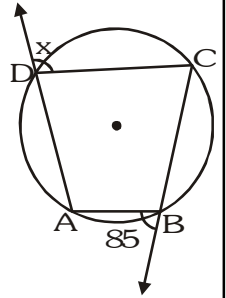
(A)  $70^\circ$

(B)  $80^\circ$

(C)  $90^\circ$

(D)  $100^\circ$

35. In figure, ABCD is a cyclic quadrilateral, then the value of x is :



(A)  $90^\circ$

(B)  $95^\circ$

(C)  $100^\circ$

(D) None of these

Space for Rough Work

## MENTAL ABILITY

### SECTION - A (Single Correct)

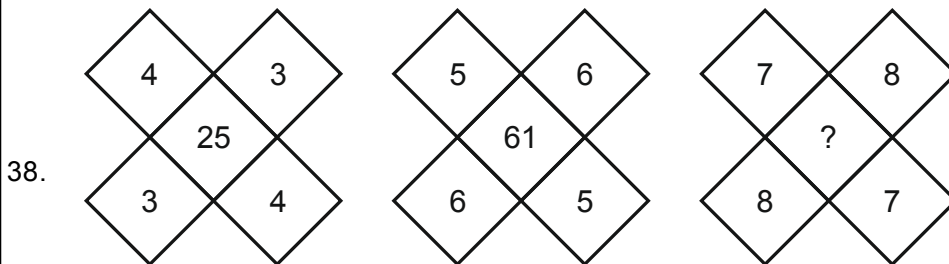
**Directions (36 to 38) :** Each question consists a number series/alphabetical series with one term missing which is shown by (?). Find the missing term:

36. 11, 22, 44, 77, 121, ?

- (A) 167                      (B) 176                      (C) 165                      (D) 146

37. AZ, GT, MN, ?, YB

- (A) KF                      (B) RX                      (C) SH                      (D) TS



- (A) 64                      (B) 113                      (C) 49                      (D) 15

**Directions (39 to 40) :** These questions have four options in which three belongs to same group. Find out the odd one:

39. (A) Apple                      (B) Carrot                      (C) Orange                      (D) Guava

40. (A) volume : Litre                      (B) Time : Second                      (C) Length : Metre                      (D) Pressure : Barometer

**Direction (41 to 47) :** Choose the word from given alternatives, which bears same relationship to that group:

41. Rupee : India :: Yen : ?

- (A) Pakistan                      (B) Japan                      (C) Bangladesh                      (D) Nepal

42. CIRCLE : RICELC :: SQUARE : ?

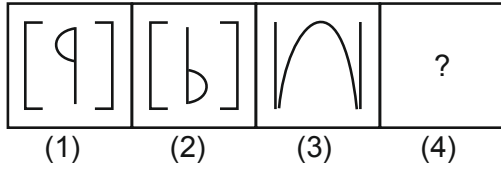
- (A) QSUERA                      (B) QUSERA                      (C) UQSAER                      (D) UQSERA

**Space for Rough Work**

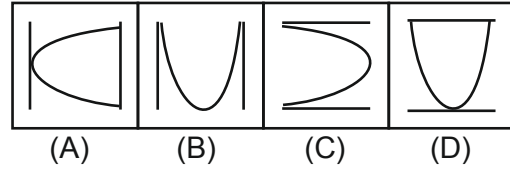


**Direction (48 to 50) :** Each of the following problems, contains four Problem Figures marked A, B, C, and D and four Answer Figures marked (A), (B), (C) and (D). Select a figure from amongst the Answer Figures which will continue the same series as given in the Problem Figures.

48. Problem Figure :



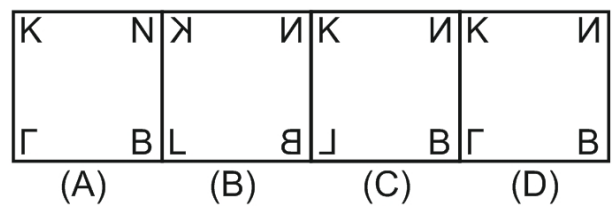
Answer Figure:



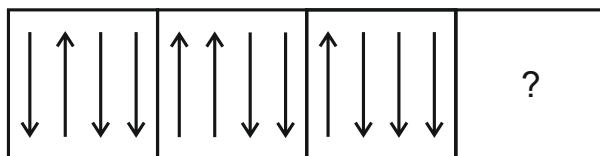
49. Problem Figure :



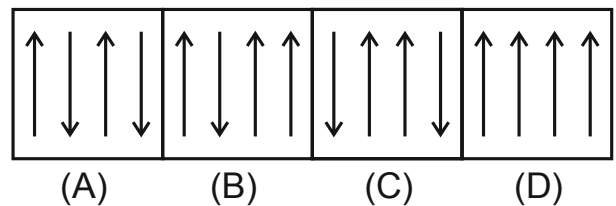
Answer Figure:



50. Problem Figure :



Answer Figure:



Space for Rough Work

<b>ANSWER KEY (CLASS 8TH)</b>									
1	2	3	4	5	6	7	8	9	10
<b>A</b>	<b>A</b>	<b>C</b>	<b>C</b>	<b>B</b>	<b>A</b>	<b>D</b>	<b>A</b>	<b>B</b>	<b>B</b>
11	12	13	14	15	16	17	18	19	20
<b>B</b>	<b>A</b>	<b>B</b>	<b>B</b>	<b>B</b>	<b>B</b>	<b>B</b>	<b>C</b>	<b>A</b>	<b>D</b>
21	22	23	24	25	26	27	28	29	30
<b>B</b>	<b>C</b>	<b>C</b>	<b>A</b>	<b>A</b>	<b>D</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>B</b>
31	32	33	34	35	36	37	38	39	40
<b>B</b>	<b>C</b>	<b>B</b>	<b>B</b>	<b>B</b>	<b>B</b>	<b>C</b>	<b>B</b>	<b>B</b>	<b>D</b>
41	42	43	44	45	46	47	48	49	50
<b>B</b>	<b>D</b>	<b>C</b>	<b>C</b>	<b>A</b>	<b>D</b>	<b>A</b>	<b>B</b>	<b>D</b>	<b>A</b>