



M.M. 100

TIME 50 MIN.

Name :

Father Name :

Mobile No. :

**IMPORTANT INSTRUCTIONS**

- |   |   |
|---|---|
| <ol style="list-style-type: none"> <li>1. This booklet contains 50 Questions.</li> <li>2. All questions are compulsory and carry 2 mark,</li> <li>3. There will be no negative marking.</li> <li>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.</li> <li>5. You will not be supplied the Answer-Sheet separately by the invigilator. You must complete the details of <i>Name</i> , <i>Father Name and Mobile Number</i> 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.</li> </ol> | <ol style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>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.</li> </ol> |
|---|---|



**VIGYAN DHARA**

**IIT-JEE/NEET/AIIMS**

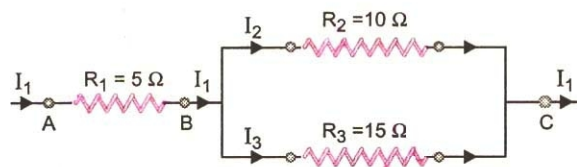
*The Temple of Education*



## SCIENCE

### SECTION - A (Single Correct)

1. Three resistors are connected as given in the figure. If 1 A current is following through  $5\Omega$  resistor, then



What is the potential difference across AB and across AC?

- (A) 5V, 11V      (B) 11V, 5V      (C) 5V, 5V      (D) 11V, 11V
2. Choose the correct option :  
The magnetic field inside a long straight solenoid carrying current.
- (A) Is zero      (B) Decreases as we move towards its end  
(C) Increases as we move towards its end      (D) Is the same at all points
3. The main component of sun light causing heating effect is
- (A) Visible-light      (B) Infra-red rays      (C) Ultra-violet rays      (D) All the above
4. Which one is balancing equation :
- (A)  $C_2H_6 + O_2 \rightarrow CO_2 + H_2O$       (B)  $CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$   
(C)  $CaCO_3 \rightarrow 2CaO + CO_2$       (D)  $SO_3 + 2H_2O \rightarrow H_2SO_4$
5. Equal length of magnesium ribbons are taken in test - tubes A and B. Hydrochloric acid is added to test tube A and acetic acid is added to test tube B. In which test tube the fizzing occur more vigorously.
- (A) A      (B) B  
(C) Equal is both tubes      (D) None of these
6. Find the no. of hydrogen atom in a alkyne having 75 carbon atoms.
- (A) 147      (B) 148      (C) 146      (D) 150

Space for Rough Work

### SECTION - B (Comprehension)

Read the passage and give the answer of the following questions:

In the Modern Periodic Table, the elements are arranged in order of increasing atomic numbers, that is in order of increased nuclear charge. Instead of listing the 103 elements as one long list, the periodic table arrange them into several horizontal rows or periods, in such a way that each row begins with an alkali metal and ends with a noble gas.

7. Any period of periodic table starts with  
(A) Alkali metal      (B) Alkaline earth metal      (C) Non-metals      (D) Noble gas
8. In the Modern Periodic Table, the elements are arranged in order of  
(A) Increasing atomic number      (B) Increasing mass number  
(C) Increasing atomic volume      (D) Both (A) and (B)
9. On moving from left to right in a periodic table  
(A) Number of electrons increase  
(B) Number of electrons decrease  
(C) Number of neutrons decreases  
(D) Number of electrons first increases then decreases

### SECTION - C (Matrix Match)

10. Match the following :

#### Column I

- a. Myopia
- b. Hypermetropia
- c. Astigmatism
- d. Presbyopia

- (A) a(i), b(ii), c(iv), d(ii)
- (C) a(i, iii), b(ii), c(iv), d(ii, i)

#### Column II

- (i) Concave lens
- (ii) Convex lens
- (iii) Can see nearby objects clearly, but not far off objects
- (iv) Surface of crystalline lens of the eye becomes uneven

- (B) a(iii), b(ii), c(iv), d(ii)
- (D) a(i, iii), b(iv), c(ii), d(ii)

Space for Rough Work

11. Match the following :

**Column I**

- a. Alkanes
- b. Ethyl alcohol
- c. Carboxylic acid
- d. Absolute alcohol
- e. Sweet smell

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

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

**Column II**

- (i)  $C_2H_5OH$  (100%)
- (ii) Ester
- (iii) Saturated hydrocarbons
- (iv)  $C_2H_5OH$
- (v)  $HCOOH$
- (vi)  $C_2H_6$

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

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

**SECTION - E (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 : If a convex lens is kept in water, its converging power decreases.

R : Focal length of a convex lens is independent of the refractive index of the medium used.

13. A : A dentist uses a concave mirror to examine a small cavity.

R : A dentist uses a concave mirror which can form a magnified, virtual image of an object.

14. A : A single lens produces a coloured images of an object illuminated by white light.

R : The refractive index of the material of the lens is different for different wavelengths of light.

Space for Rough Work

15. Which of the following statements is incorrect?
- (A) Regeneration is not exactly same as reproduction
  - (B) Regeneration is carried out by specialised cells
  - (C) The ability of fully differentiated organism to give rise to new individual organism from their body parts is known as regeneration
  - (D) Hydra, Planaria and Chlamydomonas can be cut into number of parts and each part grows into a complete organism
16. Testosterone helps in
- (A) Regulating the formation of sperms
  - (B) Controlling the formation of ova
  - (C) Providing nutrition to sperms
  - (D) Tail formation in sperms
17. Which of the following contrasting pairs of traits were selected by Mendel?
- (i) Shoot and root colour
  - (ii) Seed shape and colour, stem height
  - (iii) Pod colour
  - (iv) Pod shape and flower position
- (A) (ii), (iii) and (iv)    (B) (i), (ii) and (iii)    (C) (i), (ii) and (iv)    (D) (i), (iii) and (iv)
18. Miller and Urey, conducted experiment and they assembled an atmosphere similar to that thought to exist on early earth. The molecules they added in the flask were
- (A)  $\text{NH}_3$ ,  $\text{CH}_4$ ,  $\text{H}_2\text{S}$  and  $\text{O}_2$
  - (B)  $\text{NH}_3$ ,  $\text{CH}_4$ ,  $\text{O}_2$  and  $\text{H}_2\text{O}$
  - (C)  $\text{NH}_3$ ,  $\text{CH}_4$ ,  $\text{CO}_2$  and  $\text{H}_2\text{S}$
  - (D)  $\text{NH}_3$ ,  $\text{CH}_4$ ,  $\text{H}_2$  and  $\text{H}_2\text{O}$
19. Increase in skin cancers and higher mutation rates are generally the consequences of
- (A)  $\text{CO}_2$
  - (B) Ozone depletion
  - (C) Biomagnification
  - (D) Acid rain
20. Which of the following constitute a food chain?
- (A) Grass, goat and human
  - (B) Grass, wheat and mango
  - (C) Goat, cow and elephant
  - (D) Grass, fish and goat

**Space for Rough Work**

# MATHEMATICS

## SECTION - A (Single Correct)

21. The Value of  $\frac{7}{\cos^2 A} - \frac{7}{\cot^2 A}$  is

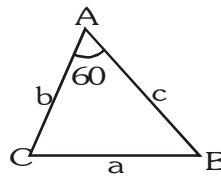
- (A) 1                      (B) 9                      (C) 7                      (D) 0

22. if  $a, b, c \in \mathbb{R}$  and  $a > b \Rightarrow ac < bc$ , then –

- (A)  $c \geq 0$               (B)  $c \leq 0$               (C)  $c > 0$               (D)  $c < 0$

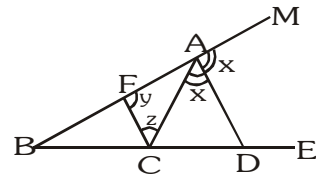
23. In the adjoining figure  $\angle BAC = 60^\circ$  and  $BC = a$ ,  $AC = b$  and  $AB = c$ , then :

- (A)  $a^2 = b^2 + c^2$   
 (B)  $a^2 = b^2 + c^2 - bc$   
 (C)  $a^2 = b^2 + c^2 + bc$   
 (D)  $a^2 = b^2 + 2bc$



24. The bisector of the exterior  $\angle A$  of  $\triangle ABC$  intersects the side  $BC$  produced to  $D$ . Here  $CF$  is parallel to  $AD$ .

- (A)  $\frac{AB}{AC} = \frac{BD}{CD}$   
 (B)  $\frac{AB}{AC} = \frac{CD}{BD}$   
 (C)  $\frac{AB}{AC} = \frac{BC}{CD}$               (D) None of these



25. If  $\tan\theta + \sec\theta = e^x$ , then  $\cos\theta$  equals :

- (A)  $\frac{e^x + e^{-x}}{2}$               (B)  $\frac{2}{e^x + e^{-x}}$               (C)  $\frac{e^x - e^{-x}}{2}$               (D)  $\frac{e^x - e^{-x}}{e^x + e^{-x}}$

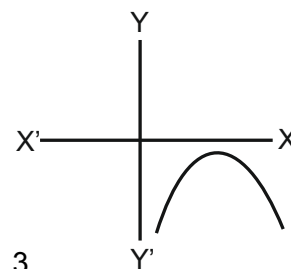
26. In a  $\triangle ABC$ , if  $a^2 + b^2 + c^2 - ab - bc - ca = 0$ , then  $\sin^2 A + \sin^2 B + \sin^2 C =$

- (A)  $\frac{4}{9}$                       (B)  $\frac{9}{4}$                       (C)  $3\sqrt{3}$                       (D) 1

Space for Rough Work

27. In the given graph no. of zeroes of quadratic equation :

$$ax^2 + bx + c = 0$$



- (A) 0                      (B) 1                      (C) 2                      (D) 3

28. The point of intersection of the lines  $\frac{x}{a} + \frac{y}{b} = 1$  and  $\frac{x}{b} + \frac{y}{a} = 1$ , lies on the line :

- (A)  $x - y = 0$               (B)  $x + y = \frac{2ab}{a+b}$               (C)  $x - y = \frac{2ab}{a+b}$               (D) Both (A) and (B)

29. For an A.P.,  $S_{2n} = 3S_n$ . The value of  $\frac{S_{3n}}{S_n}$  is equal to :

- (A) 4                      (B) 6                      (C) 8                      (D) 10

30. If a, b, c are in A.P. and also  $\frac{1}{a}, \frac{1}{b}, \frac{1}{c}$  are in A.P., then :

- (A)  $a = b \neq c$               (B)  $a \neq b = c$               (C)  $a = b = c$               (D)  $a \neq b \neq c$

31. An A.P. consists of n (odd) terms and its middle term is m. Then the sum of the A.P. is :

- (A) 2mn                      (B)  $\frac{1}{2}mn$                       (C) mn                      (D)  $mn^2$

32. A earns 20% more than B but spends 20% less than B. If A saves Rs. 960 and B saves Rs. 200, then their incomes are

- (A) Rs. 2400, Rs. 2000                      (B) Rs. 1200, Rs. 1100  
(C) Rs. 1800, Rs. 1600                      (D) Rs. 1400, Rs. 1300

33. For what value of k,  $(4 - k)x^2 + (2k + 4)x + (8k + 1)$  is a perfect square :

- (A) 1                      (B) 2                      (C) 3                      (D) 4

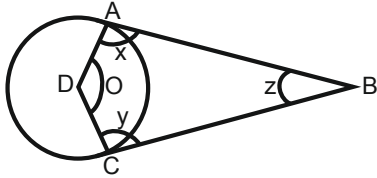
34. If one root of  $5x^2 + 13x + k = 0$  is reciprocal of the other then k -

- (A) 0                      (B) 5                      (C)  $\frac{1}{6}$                       (D) 6

Space for Rough Work



35.



Which one is true

(A)  $\angle x + \angle z = \angle x + \angle y$

(B)  $\angle o \times \angle x = \angle z \times \angle y$

(C)  $\angle x \times \angle z = \angle o \times \angle y$

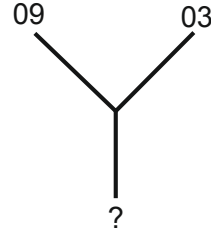
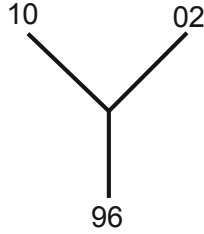
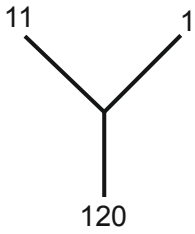
(D) None of the above

### 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.



(A) 81

(B) 72

(C) 90

(D) 27

37. 1, 2, 6, 15, 31, ?

(A) 56

(B) 55

(C) 57

(D) 58

38. OTE, PUF, QVG, RWH, ?

(A) SYJ

(B) TXI

(C) SXJ

(D) SXI

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

39. (A) Bharat Ratna

(B) Padma Shri

(C) Padam Bhushan

(D) Param Vir Chakra

40. (A) Pascal : Pressure

(B) Watt : Power

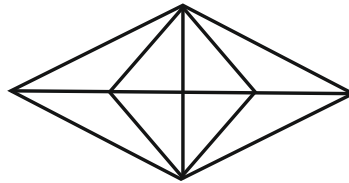
(C) Ampere : Current

(D) Radian : Degree

**Space for Rough Work**

**Direction (41 to 48) :** Choose the word from given alternatives, which bears same relationship to that group:

41. As BLOCKED is to YOLXPVW, so also OZFMXS is to  
(A) LABOUR (B) LAUNCH (C) NAUGHT (D) RESULT
42. Given set (10, 30, 70)  
(A) (17, 37, 77) (B) (20, 30, 60) (C) (41, 55, 66) (D) (60, 70, 90)
43. Arrange the given words in meaningful sequence :  
(1) Seed (2) Wood (3) Tree (4) Plant  
(5) Furniture  
(A) (1), (3), (4), (2), (5) (B) (1), (4), (3), (2), (5)  
(C) (1), (3), (4), (5), (2) (D) (1), (4), (3), (5), (2)
44. How many triangles are there in the following figure?



- (A) 10 (B) 14 (C) 22 (D) 20
45. A man starts from a point, walks 4 miles towards North and turns left and walks 6 miles, turns right and walks for 3 miles and again turns right and walks 4 miles and takes rest for 30 min. He gets up and walks straight 2 miles in the same direction and turn right and walks 1 mile. What is the direction, he is facing?  
(A) North (B) South (C) South-East (D) West
46. In a group of six students, Nitin is heavier than Mahesh but lighter than Nandu. Ketan is lighter than Mahesh but he is not as light as Ramesh. If Nandu is lighter than Amit, then who is the lightest?  
(A) Mahesh (B) Ketan (C) Ramesh (D) Can't be determined
47. Ram wants to go to the school. He starts from his home which is in the East and comes to the crossing. The road to the left ends in a fire station ahead is the bookshop. In which direction is the school?  
(A) South (B) North (C) East (D) West

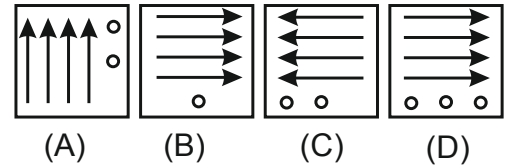
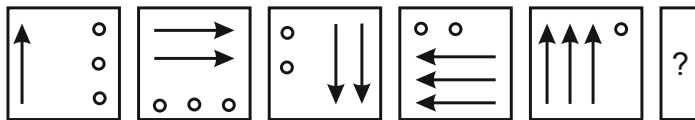
**Space for Rough Work**

48. A, B, C, D, E and F are sitting around a round table. A is between E and F, E is opposite to D and C is not in either of the neighbouring seats of E. Who is opposite to B?
- (A) F                      (B) C                      (C) D                      (D) None of these

**Direction (49 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.

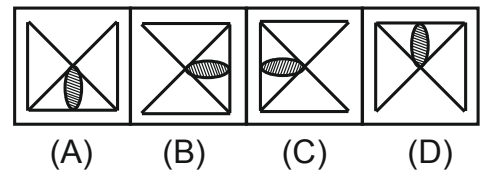
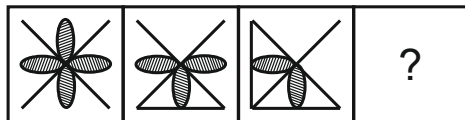
49. **Problem Figure:**

**Answer Figure :**



50. **Problem Figure :**

**Answer Figure :**



Space for Rough Work

**ANSWER KEY (CLASS 10TH)**

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