



# RANKRIDGE IIT JEE/NEET JUNIOR COLLEGE (LONGTERM)

TELANGANA

STREAM: JR MPC  
Time: 3:00 Hours

## UNIT TEST-02

Date: 11-08-2025  
Max Marks: 300

### MATHEMATICS

#### (SINGLE CORRECT ANSWER TYPE)

This section contains 20 multiple choice questions. Each question has 4 options (A), (B), (C) and (D) for its answer, out of which ONLY ONE option can be correct.

Marking scheme: +4 for correct answer, 0 if not attempted and -1 in all other cases

1. The coordinates of the point which divides the line segment joining  $(a+b, a-b)$  and  $(a-b, a+b)$  in the ratio of  $a:b$  externally is .

(A)  $\left( \frac{a^2 - 2ab - b^2}{a-b}, \frac{a^2 + b^2}{a-b} \right)$

(B)  $\left( \frac{a^2 - 2ab - b^2}{a+b}, \frac{a^2 + b^2}{a+b} \right)$

(C)  $\left( \frac{a^2 + 2ab - b^2}{a+b}, \frac{a^2 - b^2}{ab} \right)$

(D)  $\left( \frac{a^2 - ab - 2b^2}{a+2b}, \frac{a^2 - ab - 2b^2}{2a+b} \right)$

2. If the points  $(k, 2k)$ ,  $(3k, 3k)$  and  $(3, 1)$  are collinear, then  $k = \dots$

(A)  $1/3$       (B)  $-1/3$

(C)  $3$       (D)  $-3$

3. If the sides of  $\triangle ABC$  are 5, 7, 8 units then

$AG^2 + BG^2 + CG^2 =$

(A) 46      (B) 138

(C) 92      (D) 69

4. The incentre of the triangle with vertices

$(1, \sqrt{3}) (0, 0) (2, 0)$  is

(A)  $\left( 1, \frac{\sqrt{3}}{2} \right)$       (B)  $\left( \frac{2}{3}, \frac{1}{\sqrt{3}} \right)$

(C)  $\left( \frac{2}{3}, \frac{\sqrt{3}}{2} \right)$       (D)  $\left( 1, \frac{1}{\sqrt{3}} \right)$

5. In radius of the triangle with vertices

$(1, 1), (-1, -1), (-\sqrt{3}, \sqrt{3})$  is

(A)  $2\sqrt{3}$       (B)  $3\sqrt{2}$

(C)  $\sqrt{\frac{2}{3}}$       (D) 6

6. One vertex of an equilateral triangle is

$(2, 2)$  and its centroid is  $\left( -\frac{2}{\sqrt{3}}, \frac{2}{\sqrt{3}} \right)$

then length of its side is

(A)  $4\sqrt{2}$       (B)  $4\sqrt{3}$

(C)  $3\sqrt{2}$       (D)  $5\sqrt{2}$

7.  $A(2, 3), B(-3, 4)$  are two points. If a point P moves such that the area of

$\Delta PAB$  is 8.5 sq.units then the locus of P is

(A)  $x^2 + 10xy + 25y^2 - 34x - 170y = 0$

(B)  $x^2 + 10xy - 25y^2 - 34x - 170y = 0$

(C)  $x^2 - 10xy + 25y^2 - 34x + 170y = 0$

(D)  $x^2 - 10xy - 25y^2 + 34x - 170y = 0$

8. Locus represented by  $x = a + b \sec \theta$ ,  
 $y = b + a \tan \theta$  is

- (A) a hyperbola      (B) a parabola  
(C) an ellipse      (D) a straight line

9. Equation

$\sqrt{(x-5)^2 + y^2} + \sqrt{(x+5)^2 + y^2} = 20$

represents

- (A) a circle      (B) a pair of lines  
(C) a parabola      (D) an ellipse

10. If  $A = (1, -1)$  locus of B is  $x^2 + y^2 = 16$ . If P divides AB in the ratio 3:2 then locus of P is

(A)  $(x-2)^2 + (y-3)^2 = 4$

(B)  $(x+1)^2 + (y-2)^2 = 4$

(C)  $(x-3)^2 + (y-2)^2 = 4$

(D)  $(5x-2)^2 + (5y+2)^2 = 144$

11. Vertices of a variable triangle are  $(3, 4)$ ,  $(5\cos\theta, 5\sin\theta)$  and  $(5\sin\theta, -5\cos\theta)$  where  $\theta \in R$ . Locus of its orthocentre is

- (A)  $x^2 + y^2 + 6x + 8y - 25 = 0$   
 (B)  $x^2 + y^2 - 6x - 8y + 25 = 0$   
 (C)  $x^2 + y^2 + 6x - 8y - 25 = 0$   
 (D)  $x^2 + y^2 - 6x - 8y - 25 = 0$
12. If  $a, x_1, x_2, x_3, \dots$  and  $b, y_1, y_2, \dots$  form two infinite A.P's with common difference  $p$  and  $q$  respectively then the locus of  $P(h, k)$  when  $h = \frac{x_1 + x_2 + x_3 + \dots + x_n}{n}$ ,  
 $k = \frac{y_1 + y_2 + \dots + y_n}{n}$
- (A)  $q(x-a) = p(y-b)$   
 (B)  $b(x+p) = a(y+q)$   
 (C)  $p(x+a) = q(y+b)$   
 (D)  $p(y+a) = q(x+b)$
13. The line joining  $(5, 0)$  to  $(10\cos\theta, 10\sin\theta)$  is divided internally in the ratio  $2:3$  at P, then the locus of P is  
 (A)  $x^2 + 2xy + y^2 - 6x = 0$   
 (B)  $x + y - 3 = 0$   
 (C)  $(x-3)^2 + y^2 = 16$   
 (D)  $x^2 = y - 3$
14. The equation  $16x^2 + y^2 + 8xy - 74x - 78y + 212 = 0$  represents  
 (A) a circle  
 (B) a parabola  
 (C) an ellipse  
 (D) a hyperbola
15. The system of equations  $(\cos 2\theta)x + 4y + 3z = 0$ ,  
 $2x + 7y + 7z = 0$  has non trivial solution then  $\sin 3\theta + 2\cos 2\theta =$   
 (A) 2  
 (B) -2  
 (C) 0  
 (D) 1
16. If  $f(x) = \begin{vmatrix} 2\cos x & 1 & 0 \\ x - \frac{\pi}{2} & 2\cos x & 1 \\ 0 & 1 & 2\cos x \end{vmatrix}$ , then  $f'(\pi) =$   
 (A) 0  
 (B) 2  
 (C)  $\frac{\pi}{2}$   
 (D)  $\pi - 6$
17.  $A = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & -1 \\ 0 & -2 & 4 \end{bmatrix}$ ,  $I = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$  and  $A^{-1} = \frac{1}{6}(A^2 + \alpha A + \beta I)$  then  
 (A)  $\alpha = -6, \beta = 11$  (B)  $\alpha = 6, \beta = -11$   
 (C)  $\alpha = -6, \beta = -11$  (D)  $\alpha = 6, \beta = 11$
18. If  $a, b, c$  are non zero real numbers and if the equations  $(a-1)x = y+z$ ,  
 $(b-1)y = z+x$ ,  $(c-1)z = x+y$  has a non trivial solution then  $ab+bc+ca$  equals  
 (A)  $a+b+c$  (B)  $abc$   
 (C) 1 (D)  $a+b-c$
19. If  $A = \begin{bmatrix} 1 & 2 & -1 \\ -1 & 1 & 2 \\ 2 & -1 & 1 \end{bmatrix}$  then  $\det(\text{adj } A)$  is  
 (A)  $(14)^4$  (B)  $(14)^3$   
 (C)  $(14)^2$  (D)  $(14)^1$
20. Matrix A is given by  $A = \begin{bmatrix} 6 & 11 \\ 2 & 4 \end{bmatrix}$  then the determinant of  $A^{2015} - 6A^{2014}$  is  
 (A)  $2^{2016}$  (B)  $(-11)2^{2015}$   
 (C)  $-2^{2015} \times 7$  (D)  $(-9)2^{2014}$

#### (NUMERICAL VALUE TYPE)

Section-II contains 5 Numerical Value Type questions.

Marking scheme: +4 for correct answer, 0 if not attempt and -1 in all other cases

21. The value of the determinant

$$\begin{vmatrix} 10! & 11! & 12! \\ 11! & 12! & 13! \\ 12! & 13! & 14! \end{vmatrix} \text{ is } A(10!11!12!).$$

Find A \_\_\_\_\_.

22. In  $\Delta ABC$ ,  $A = (1, 2), B = (5, 5)$ ,

$\angle ACB = 90^\circ$ . If area of  $\Delta ABC$  is to be 6.5 sq. units, then the possible number of points for C is 9.

23. The sum of the squares of the sides of a triangle is 32 units. Then the sum of the squares of the medians of the triangle is
24. A straight line of length 3 units slides with its ends A, B always on x and y axes respectively. Locus of centroid of  $\triangle OAB$  is  $x^2 + y^2 = k$  then  $k =$
25. The locus of point of intersection of the lines  $y + mx = \sqrt{4 + m^2}$  and  $my - x = \sqrt{1 + 4m^2}$  is  $x^2 + y^2 = k$  then  $k =$

## PHYSICS

### (SINGLE CORRECT ANSWER TYPE)

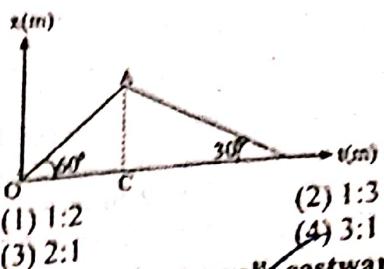
This section contains 20 multiple choice questions. Each question has 4 options (A), (B), (C) and (D) for its answer, out of which ONLY ONE option can be correct.

- Marking scheme: +4 for correct answer, 0 if not attempted and -1 in all other cases
26. An engine of a train moving with uniform acceleration passes an electric pole with velocity 6 m/s and the last compartment with velocity 8 m/s. The middle point of the train passes the same pole with a velocity of :-
- (1)  $\sqrt{14}$  m/s      (2) 5 m/s  
 (3) 50 m/s      (4) 7 m/s

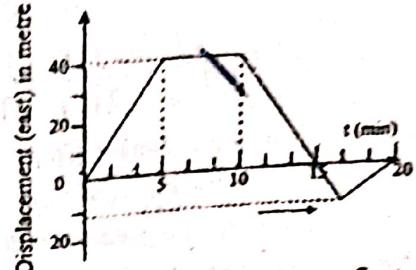
27. A starts from rest and moves with acceleration  $a_1$ . Two seconds later, B starts from rest and moves with an acceleration  $a_2$ . If the displacement of A in the 5<sup>th</sup> second is the same as that of B in the same interval, the ratio of  $a_1$  to  $a_2$  is
- (1) 9:5      (2) 5:9  
 (3) 1:1      (4) 1:3

28. A moving car possesses average velocities of  $15\text{ms}^{-1}$ ,  $10\text{ms}^{-1}$  and  $15\text{ms}^{-1}$  in the first, second, and third seconds respectively. What is the total distance covered by the car in these 3s?
- (1) 15m      (2) 30m  
 (3) 55m      (4) 45m

29. In displacement time graph, two straight lines make angles  $60^\circ$  and  $30^\circ$  with time axis. The ratio of magnitudes of the velocities represented by them is



30. A boy begins to walk eastward along a straight street in front of his house and the graph of his displacement from home is shown in the following figure. His average speed for the whole time interval is equal to



- (1)  $8\text{m min}^{-1}$       (2)  $5\text{m min}^{-1}$   
 (3)  $\frac{8}{3}\text{m min}^{-1}$       (4)  $2\text{m min}^{-1}$

31. A body falls freely from a height 'h'. Its average velocity when it reaches earth is
- (1)  $\sqrt{gh}$       (2)  $\sqrt{\frac{gh}{2}}$   
 (3)  $\sqrt{2gh}$       (4)  $g\sqrt{h}$

32. A stone is thrown upwards with a speed 'u' from the top of the tower reaches the ground with a velocity '3u'. The height of the tower is

- (1)  $\frac{3u^2}{g}$       (2)  $\frac{4u^2}{g}$   
 (3)  $\frac{6u^2}{g}$       (4)  $\frac{9u^2}{g}$

33. A freely falling body travels— of total distance in 5th second

- (1) 8%      (2) 12%  
 (3) 25%      (4) 36%

34. A ball released from a height 'h' touches the ground in 't's. After  $t/2$ s since dropping, the height of the body from the ground

- (1)  $\frac{h}{2}$       (2)  $\frac{h}{4}$

$$\frac{3h}{4}$$

$$(4) \frac{3h}{2}$$

35. A train starts from rest and moves with uniform acceleration  $\alpha$  for some time and acquires a velocity 'v'. It then moves with constant velocity for some time and then decelerates at rate  $\beta$  and finally comes to rest at the next station. If 'L' is distance between two stations then total time of travel is

(1)  $\frac{L}{v} + \frac{v}{2} \left( \frac{1}{\alpha} + \frac{1}{\beta} \right)$  ~~(2)  $\frac{L}{v} - \frac{v}{2} \left( \frac{1}{\alpha} + \frac{1}{\beta} \right)$~~

(3)  $\frac{L}{v} - \frac{v}{2} \left( \frac{1}{\alpha} - \frac{1}{\beta} \right)$  ~~(4)  $\frac{L}{v} + \frac{v}{2} \left( \frac{1}{\alpha} - \frac{1}{\beta} \right)$~~

36. At a metro station, a girl walks up a stationary escalator in time  $t_1$ . If she remains stationary on the escalator, then the escalator takes her up in time  $t_2$ . The time taken by her to walk upon the moving escalator will be

(1)  $\frac{t_1 + t_2}{2}$  ~~(2)  $\frac{t_1 t_2}{(t_2 - t_1)}$~~

~~(3)  $\frac{t_1 t_2}{(t_2 + t_1)}$~~  ~~(4)  $t_1 - t_2$~~

37. If the velocity of a particle is  $v = At + Bt^2$ , where A and B are constants, then the distance travelled by it between 1s and 2s is

(1)  $\frac{3}{2}A + \frac{7}{3}B$  ~~(2)  $\frac{A}{2} + \frac{B}{3}$~~

~~(3)  $\frac{3}{2}A + 4B$~~  ~~(4)  $3A + 7B$~~

38. The x and y coordinates of the particle at any time are  $x = 5t - 2t^2$  and  $y = 10t$  respectively, where x and y are in meters and t in seconds. The acceleration of the particle at  $t = 2$  s is

(1) 0 ~~(2)  $5m/s^2$~~

~~(3)  $-4m/s^2$~~  ~~(4)  $-8m/s^2$~~

39. A man is going due east with a velocity of  $5ms^{-1}$ . It is vertically raining downwards with a velocity of  $4ms^{-1}$ . At what angle should he hold the umbrella to the

vertical so as to protect him self from the rain?

(1)  $\tan^{-1} \left( \frac{5}{4} \right)$  in anti-clockwise direction

~~(2)  $\tan^{-1} \left( \frac{5}{4} \right)$  in clock-wise direction~~

(3)  $\tan^{-1} \left( \frac{4}{5} \right)$  North of East

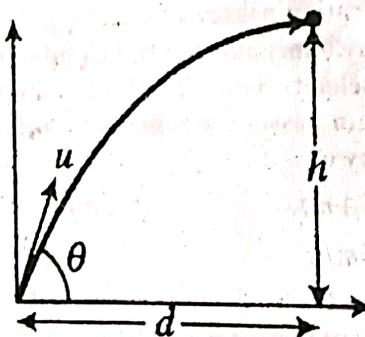
(4)  $\tan^{-1} \left( \frac{4}{5} \right)$  East of North

40. The acceleration of a projectile relative to another projectile is

(1)  $-g$  ~~(2) g~~

(3)  $2g$  ~~(4) 0~~

41. If a stone is to hit at a point which is at a distance d away and at a height h (see fig) above the point from where the stone starts, then what is the value of initial speed u if the stone is launched at an angle  $\theta$ ?



~~(1)  $\frac{d}{\sin \theta} \sqrt{\frac{g}{2(d \tan \theta - h)}}$~~

~~(2)  $\frac{d}{\cos \theta} \sqrt{\frac{g}{2(d \tan \theta - h)}}$~~

(3)  $\sqrt{\frac{gd^2}{h \cos^2 \theta}}$  ~~(4)  $\sqrt{\frac{gd^2}{(d-h)}}$~~

42. A particle is projected with a velocity v such that its range on the horizontal plane is twice the greatest height attained by it. The range of the projectile is (when its acceleration due to gravity is 'g')

(1)  $\frac{4v^2}{5g}$  ~~(2)  $\frac{4g}{5v^2}$~~

- (3)  $\frac{v^2}{g}$
- (4)  $\frac{4v^2}{\sqrt{5}g}$
43. A ball is thrown from a point with a speed  $V_0$ , at an angle of projection  $\theta$ . From the same point and at the same instance a person starts running  $V_0$  with a constant speed  $\frac{V_0}{\sqrt{2}}$ . To catch the ball will the person be able to catch the ball? If yes, what should be the angle of projection  
 (1) yes,  $60^\circ$   
 (2) yes,  $30^\circ$   
 (3) No  
 (4) Yes,  $45^\circ$
44. A stone is thrown with a velocity  $v$  at an angle  $\theta$  with the horizontal. Its speed when it makes an angle  $\beta$  with the horizontal is  
 (1)  $v \cos \theta$   
 (2)  $\frac{v}{\cos \beta}$   
 (3)  $v \cos \theta \cos \beta$   
 (4)  $\frac{v \cos \theta}{\cos \beta}$
45. A stair case contains ten steps each 10 cm high and 20 cm wide. The minimum horizontal velocity with which the ball has to be rolled off the upper most step, so as to hit directly the edge of the lowest step is (approximately)  
 (1)  $42 \text{ ms}^{-1}$   
 (2)  $4.2 \text{ ms}^{-1}$   
 (3)  $24 \text{ ms}^{-1}$   
 (4)  $2.4 \text{ ms}^{-1}$

#### NUMERICAL VALUE TYPE

Section-II contains 5 Numerical Value Type questions.

Marking scheme: +4 for correct answer, 0 if not attempted and -1 in all other cases

46. A balloon is going upwards with velocity 12 m/sec. It releases a packet when it is at a height of 65 m from the ground. How much time the packet will take to reach the ground ( $g = 10 \text{ m/sec}^2$ ).  
 5

47. A body is dropped from the roof of a multistoried building. It passes the ceiling of the 15th story at a speed of  $20 \text{ ms}^{-1}$ . If the height of each story is 4m, the number of stories in the building is.  
 (take  $g = 10 \text{ ms}^{-2}$  and neglect air resistance)

48. A ball is thrown vertically downward with a velocity of 20 m/s from the top of a tower. It hits the ground after sometime with a velocity of 80 m/s. The height of the tower is ( $g = 10 \text{ m/s}^2$ ) 300
49. A machine gun fires a bullet of mass 40g with a velocity  $1200 \text{ ms}^{-1}$ . The man holding it can exert a maximum force of 144 N on the gun. How many bullets can he fire per second at the most? 3
50. A body is acted on by a force given by  $F = (10+2t) \text{ N}$ . The impulse received by the body during the first four seconds is 56.

#### CHEMISTRY

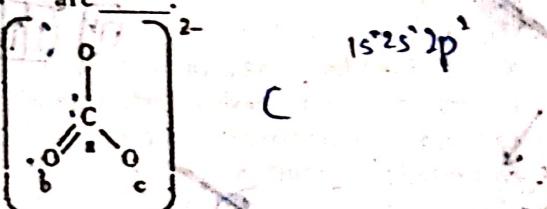
##### (SINGLE CORRECT ANSWER TYPE)

This section contains 20 multiple choice questions. Each question has 4 options (A), (B), (C) and (D) for its answer, out of which ONLY ONE option can be correct.

Marking scheme: +4 for correct answer, 0 if not attempted and -1 in all other cases

51. IE(I) and IE(II) of Mg are 178 and 348 kcal/mol. The energy required for the reaction:  $\text{Mg} \rightarrow \text{Mg}^{2+} + 2e^-$  is  
 (A) +170 kcal  
 (B) +526 kcal  
 (C) -170 kcal  
 (D) -526 kcal

52. The incomplete Lewis representation of  $\text{CO}_3^{2-}$  is given below. The formal charge on atoms marked as a, b, and c, respectively, are \_\_\_\_\_



- |        |   |    |       |    |    |
|--------|---|----|-------|----|----|
| a      | b | c  | a     | b  | c  |
| (X) 0  | 0 | -1 | (X) 0 | -2 | 0  |
| (C) -2 | 0 | 0  | (D) 0 | -1 | -1 |

53. The set of molecules in which the central atom is not obeying the octet rule is \_\_\_\_\_.

- (A)  $\text{CO}_2, \text{SiH}_4, \text{BeCl}_2$  (B)  $\text{H}_2\text{O}, \text{Cl}_2\text{O}, \text{CO}_2$   
 (C)  $\text{CH}_4, \text{NH}_3, \text{OF}_2$  (D)  $\text{SF}_6, \text{PCl}_5, \text{XeF}_2$

54. The compound which contains both ionic and covalent bonds is \_\_\_\_\_

- (A)  $\text{CH}_4$   
 (B)  $\text{H}_2$   
 (C)  $\text{KCN}$   
 (D)  $\text{KCl}$

55. The group number, number of valence electrons and valency of an element with atomic number 15, respectively, are

56. (A) 16, 5 and 2 (B) 15, 5 and 3  
 (C) 16, 6 and 3 (D) 15, 6 and 2  
 A pair of compound which have odd electrons in the group NO, CO, ClO<sub>2</sub>, N<sub>2</sub>O<sub>4</sub>, SO<sub>2</sub> and O<sub>3</sub> are 15 25 29  
N<sub>2</sub>O<sub>4</sub>, SO<sub>2</sub> and O<sub>3</sub>

57. Outermost electronic configurations of four elements A, B, C, D are given below.  
 (A)  $3s^2$  (B)  $3s^2 3p^1$   
 (C)  $3s^2 3p^3$  (D)  $3s^2 3p^4$

The correct order of first ionisation enthalpy for them is

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

58. Match the following:

	List-I (Molecule)	List-II (Number of lone pairs on central atom)
A.	$\text{NH}_3$	i. Two
B.	$\text{H}_2\text{O}$	ii. Three
C.	$\text{XeF}_2$	iii. Zero
D.	$\text{CH}_4$	iv. Four v. One

The correct answer is:

- (A) (B) (C) (D) 15 25 29  
 (A) (v) (i) (iii) (ii) 11 11 11  
 (B) (iii) (i) (ii) (v) 11 11 11  
 (C) (v) (i) (ii) (iii) 11 11 11  
 (D) (i) (v) (iii) (iv) 11 11 11

59. Which of the following represents the correct order of increasing electron gain enthalpy with negative sign for the elements O, S, F and Cl?

- (A) Cl < F < O < S (B) O < S < F < Cl  
 (C) F < S < O < Cl (D) S < O < Cl < F

The successive ionization energies (starting from the 1<sup>st</sup>) of an element are 801, 2430, 3660, 25,000 and 32,800 kJ mol<sup>-1</sup>, respectively. The element is \_\_\_\_\_.

- (A) B (B) C  
 (C) O (D) N

61. Which of the following compounds has the lowest melting point?

- (A)  $\text{CaCl}_2$  (B)  $\text{CaBr}_2$   
 (C)  $\text{CaI}_2$  (D)  $\text{CaF}_2$

62. Among the following, the maximum covalent character is shown by the compound:

- (A)  $\text{FeCl}_3$  (B)  $\text{SnCl}_2$   
 (C)  $\text{AlCl}_3$  (D)  $\text{MgCl}_2$   
 63. Match Column I with Column II and choose the correct combination from the options given.

	Column-I	Column-II
A.	Ionization energy	p. $\text{N} > \text{O} > \text{F}$
B.	Atomic radius	q. $\text{S} > \text{Se} > \text{Te} > \text{O}$
C.	Metallic character	r. $\text{Li} < \text{B} < \text{Be}$
D.	Electron gain enthalpy	s. $\text{K} < \text{Na} > \text{Mg}$

- (A) A-p; B-r, C-s; D-q

- (B) A-r; B-p, C-s; D-q

- (C) A-r; B-q; C-p; D-s

- (D) A-r; B-s; C-p; D-q

64. Given below are two statements:

Statement I: Electron affinity of fluorine is greater than chlorine.

Statement II: Ionization potential of fluorine is less than chlorine.

In the light of the above statements, choose the most appropriate answer from the options given below:

- (A) Both statement I and statement II are true.

- (B) Both statement I and statement II are false.

- (C) Statement I is true but statement II is false.

- (D) Statement I is false but statement II is true.

65. The electron affinity value are negative for.



Choose the most appropriate answer from the options given below.

- (A) A, B, D and E only      (B) A and D only

- (C) D and E only      (D) A, B and C only

66. Match List I with List II.

	List I (Oxide)	List II (Nature)
A.	$\text{Cl}_2\text{O}_7$	I. Amphoteric
B.	$\text{Na}_2\text{O}$	II. Basic
C.	$\text{Al}_2\text{O}_3$	III. Neutral
D.	$\text{N}_2\text{O}$	IV. Acidic

Choose the correct answer from the options given below

- (A) (A) (IV), (B) (III), (C) (I), (D) (II)

- (B) (A) (IV), (B) (II), (C) (I), (D) (III)

- (C) (A) (II), (B) (IV), (C) (III), (D) (I)

- (D) (A) (I), (B) (II), (C) (III), (D) (IV)

Arrange them in increasing order of  $IE_2$ .

- (A)  $A < B < C < D$       ~~(B)  $A < C < D < B$~~   
 (C)  $B < A < D < C$       ~~(D)  $B < A < C < D$~~

### (NUMERICAL VALUE TYPE)

**Section-II contains 5 Numerical Value Type questions.**

**Marking scheme:** +4 for correct answer, 0 if not attempt and -1 in all other cases

71. The lowest oxidation number of an atom in a compound  $A_2B$  is -2. The number of electrons in its valence shell is 2

72. In the lewis dot structure for  $NO_2^-$ , total number of valence electrons around nitrogen is 5.

73. Number of molecules from the following which are exceptions to octet rule is  $CO_2$ ,  $NO_2$ ,  $H_2SO_4$ ,  $BF_3$ ,  $CH_4$ ,  $SiF_4$ ,  $ClO_2$ ,  $PCl_5$ ,  $BeF_2$ ,  $C$ ,  $H_6$ ,  $CHCl_3$ ,  $CBr_4$

74. Total number of acidic oxides among  $N_2O_3$ ,  $NO_2$ ,  $N_2O$ ,  $Cl_2O_7$ ,  $S_2O_2$ ,  $CO$ ,  $CaO$ ,  $Na_2O$  and  $NO$  is 4.

75. Calculate the value of Zeff on 3d electrons of SC? (nearest integer) 14

六六六六六

## BEST OF LUCK

$$\begin{array}{r}
 \textcircled{11} \quad \textcircled{11} - \\
 \cancel{11} \quad \cancel{11} \\
 \hline
 10 \quad 4 \\
 \end{array}$$
  

$$\begin{array}{r}
 \textcircled{1.1} : \quad 16+ \\
 0 \rightarrow 1.8 \quad 0- \\
 \cancel{1.8} \cancel{.5} \\
 \hline
 50 \\
 \end{array}$$
  

$$\begin{array}{r}
 1 \rightarrow 18.5 \\
 9:1 \rightarrow x \\
 x = \\
 \end{array}$$

$$\begin{array}{r}
 0.35 \\
 \times 0.80 \\
 \hline
 28 \\
 +28 \\
 \hline
 2.80
 \end{array}
 \quad
 \begin{array}{r}
 18.5 \\
 \times 2.1 \\
 \hline
 185 \\
 +370 \\
 \hline
 38.85
 \end{array}
 \quad
 \begin{array}{r}
 19.6 \\
 \times 2.1 \\
 \hline
 19 \\
 +19 \\
 \hline
 2.196
 \end{array}$$



**RANKRIDGE IIT JEE/NEET JUNIOR  
COLLEGE (LONGTERM)**  
TELANGANA

STREAM: JR MPC  
Time: 3 Hours

**UNIT TEST-02**

Date: 11-08-2025  
Max Marks: 300

**KEY SHEET**

**MATHEMATICS**

1) A	2) B	3) A	4) D	5) C	6) A	7) <del>A</del>	8) <del>D</del> A	9) <del>C</del> D	10) D
11) <del>D</del>	12) A	13) C	14) <del>C</del> B	15) <del>C</del> A	16) <del>B</del>	17) A	18) B	19) A	20) B
21) <del>2</del>	22) <del>0</del>	23) <del>24</del>	24) <del>1</del>	25) <del>5</del>					

**PHYSICS**

26) <del>D</del>	27) B	28) B	29) D	30) <del>C</del> B	31) B	32) B	33) D	34) C	35) <del>C</del> A
36) C	37) <del>A</del>	38) C	39) B	40) D	41) B	42) <del>A</del>	43) D	44) D	45) B
46) 5	47) 20	48) 300	49) 3	50) <del>56</del>					

**CHEMISTRY**

51) B	52) A	53) D	54) <del>C</del> C	55) B	56) A	57) <del>B</del> B	58) <del>C</del> C	59) B	60) <del>A</del> A
61) <del>C</del> C	62) C	63) <del>B</del> B	64) <del>B</del> B	65) C	66) B	67) <del>B</del> B	68) C	69) <del>A</del> A	70) B
71) <del>6</del>	72) <del>8</del>	73) <del>6</del>	74) <del>4</del>	75) <del>8</del>					

