NEW STANDARD ACADEMY

Marks:300

Date : 20-07-2026 **CLASS : 11TH JEE** **Time: 3 hours**

PHYSICS

1. In 1.0 sec. a particle goes from point A to point B moving in a semicircle of radius 1.0 m. The magnitude of average velocity is :

(1) 3.14 m/sec (2) 2.0 m/sec
(3) 1.0 m/sec (4) zero

2. A body starts from rest and is uniformly accelerated for 30 s. The distance travelled in the first 10 s is x_1 , next 10 s is x_2 and the last 10 s is x_3 . Then $x_1 : x_2 : x_3$ is the same as :
(1) 1 : 2 : 4 (2) 1 : 2 : 5
(3) 1 : 3 : 5 (4) 1 : 3 : 9

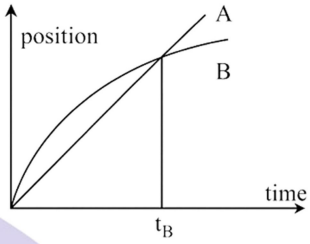
3. A particle is thrown upwards from ground. It experiences a constant resistance force which can produce retardation 2 m/s2. The ratio of time of ascent to the time of descent is [g=10 m/s2]

(1) 1 : 1 (2) $\sqrt{\frac{2}{3}}$

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

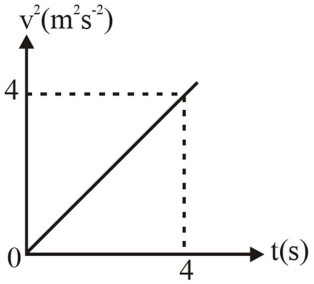
4. A ball is thrown vertically upward with initial velocity 30 m/sec. What will be its position vector at time t = 5 sec, taking origin at 45 m above the point of projection, vertical up as positive y-axis and horizontal as x-axis :
(1) (0, –25) (2) (0, –20)
(3) (0, –45) (4) (0, –5)

5. The graph shows position as a function of time for two trains running on parallel tracks. Which statement is true?



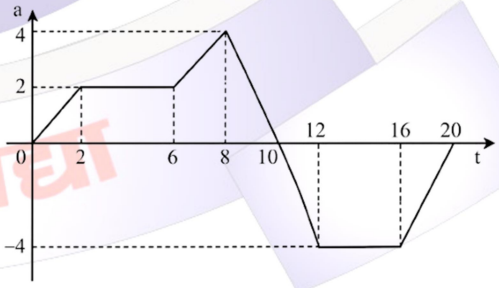
(1) At time t_B, both trains have the same velocity.
(2) Both trains have the same velocity at some time after t_B
(3) Both trains have the same velocity at some time before t_B.
(4) Somewhere on the graph, both trains have the same acceleration.

6. A particle is moving along a straight line such that square of its velocity varies with time as shown in the figure. What is the acceleration of the particle at t = 4 s?



(1) 4 m/s^2 (2) 1/4 m/s^2
(3) 1/2 m/s^2 (4) 1

7. If initial velocity of particle is 2 m/s, the maximum velocity of particle from t = 0 to t = 20 sec is :



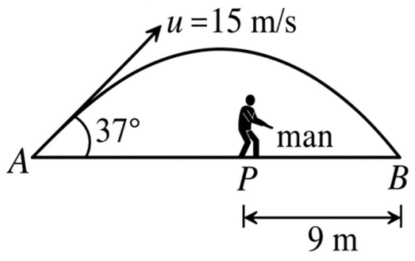
(1) 20 m/s (2) 18 m/s
(3) 22 m/s (4) 24 m/s

8. A particle is projected from a horizontal plane (x-z plane) such that its velocity vector at time t is given by $\vec{V} = a\hat{\imath} + (b - ct)\hat{\jmath}$. Its range on the horizontal plane is given by
(1) $\frac{ba}{c}$ (2) $\frac{2ba}{c}$
(3) $\frac{3ba}{c}$ (4) None

9. A particle is projected from the ground with velocity u at angle θ with horizontal. The horizontal range, maximum height and time of flight are R, H and T respectively. They are given by
R=$\frac{u^2 sin2\theta}{g}$ $H = \frac{u^2 sin^2\theta}{2g}$ and
$T = \frac{2u^2 sin\theta}{g}$
Now keeping u fixed, q is varied from 30° to 60°, then
(1) R will first increase then decrease, H will increase and T will decrease
(2) R will first increase then decrease while H and T both will increase
(3) R will decrease while H and T both will increase
(4) R will increase while H and T both will also increase

10. Suppose a player hits several baseballs. Which baseball will be in the air for the longest time?
(1) The one with the farthest range.
(2) The one which reaches maximum height.
(3) The one with the greatest initial velocity.
(4) The one leaving the bat at 45° with respect to the ground

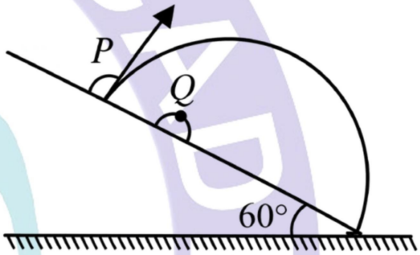
11. A ball is hit by a batsman at an angle of 37° as shown in figure. The man standing at P should run at what minimum velocity so that he catches the ball before it strikes the ground. Assume that height of man is negligible in comparison to maximum height of projectile.



(1) 3 m/s (2) 5 m/s
(3) 9 m/s (4) 12 m/s

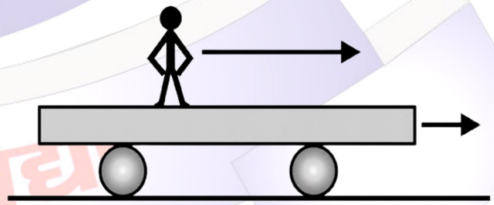
12. A ball is projected horizontally. After 3 s from projection its velocity becomes 1.25 times of the velocity of projection. Its velocity of projection is
(1) 10 m/s (2) 20 m/s
(3) 30 m/s (4) 40 m/s

13. A particle P is projected from a point on the surface of smooth inclined plane (see figure). Simultaneously another particle Q is released on the smooth inclined plane from the same position. P and Q collide after t = 4 s. The speed of projection of P is



(1) 5 m/s (2) 10 m/s
(3) 15 m/s (4) 20 m/s

14. A trolley is moving horizontally with a constant velocity of v with respect to earth. A man starts running from one end of the trolley with a velocity 1.5 v with respect to trolley. After reaching the opposite end, the man returns back and continues running with a velocity of 1.5 v w.r.t. the trolley in the backward direction. If the length of the trolley is L then the displacement of the man with respect to earth during the process will be



(1) 2.5 L (2) 1.5 L
(3) $\frac{5L}{3}$ (4) $\frac{4L}{3}$

15. A particle is thrown from a stationary platform with velocity v at an angle of 60° with the horizontal. The range obtained is R. If the platform moves horizontally in the direction of target with velocity v, the range will increase to :

(1) $\frac{3R}{2}$ (2) $\frac{5R}{2}$
(3) 2 R (4) 3 R

16. Three ships A, B & C are in motion. Ship A moves relative to B is with speed v towards North-East. Ship B moves relative to C with speed v towards the North-West. Then relative to A, C will be moving towards :
(1) North (2) South
(2) East (3) West

17. A water fountain on the ground sprinkles water all around it. If the speed of water coming out of the fountain is v, the total area around the fountain that gets wet is :
(1) $\frac{\pi V^4}{2g^2}$ (2) $\pi\frac{V^4}{g^2}$
(3) $\pi\frac{V^4}{g}$ (4) $\pi\frac{V^4}{g^2}$

18. A projectile is given an initial velocity of $(\hat{\imath} + 2\hat{\jmath})$ m/s, where $\hat{\imath}$ is along the ground and $\hat{\jmath}$ is along the vertical. If g = 10 m/s^2, the equation of its trajectory is :
(1) $y = x - 5x^2$ (2) $y = 2x - 5x^2$
(3) $4y = 2x - 5x^2$ (4) $4y = 2x - 25x^2$

19. The position co-ordinates of a particle moving in a 3-D coordinate system is given by
$x = a\cos\omega t$
$y = a\sin\omega t$
and $z = a\omega t$
The speed of the particle is :
(1) $a\omega$ (2) $\sqrt{3}\,a\omega$
(3) $\sqrt{2}\,a\omega$ (4) $2a\omega$

20. A helicopter is flying horizontally with a speed 'v' at an altitude 'h' has to drop a food packet for a man on the ground. What is the distance of helicopter from the man when the food packet is dropped?
(1) $\sqrt{\frac{2ghv^2+1}{h^2}}$ (2) $\sqrt{2ghv^2 + h^2}$
(3) $\sqrt{\frac{2v^2h}{g} + h^2}$ (4) $\sqrt{\frac{2gh}{v^2} + h^2}$

21. A train moving at 72 km/h first accelerates at 1, m/s² for 10 s and then brakes uniformly to rest in 15 s.Find the total distance travelled (in m)._____

22. Car A starts from rest with acceleration 2, m / s^2 . At the same instant, Car B passes A with a constant speed of 20, m / s.Find the time (in s) after which A overtakes B for the second time. _____

23. A ball of mass 100 g is projected with a velocity of 20 m/s at an angle of 60° with the horizontal. Find the decrease in kinetic energy (in Joules) of the ball as it moves from the point of projection to its highest point._____

24. The velocity of a particle moving along the x-axis depends on its position x as $v = 4\sqrt{x}$ m/s. Find the force acting on the particle if its mass is 0.5 kg._____

25. A particle is projected from the ground with velocity u such that its horizontal range is three times the maximum height attained by it. If the horizontal range is expressed as nu²/25g, find the value of n.
_____

CHEMISTRY

26. Among Al_2O_3 , SiO_2, P_2O_3 and SO_2 the correct order of acid strength is
(1) $Al_2O_3 < SiO_2 < SO_2 < P_2O_3$
(2) $SiO_2 < SO_2 < Al_2O_3 < P_2O_3$
(3) $SO_2 < P_2O_3 < SiO_2 < Al_2O_3$
(4) $Al_2O_3 < SiO_2 < P_2O_3 < SO_2$

27. Oxidising action increases in halogen in the following order
(1) Cl < Br < I < F (2) Cl < I < Br < F
(3) - I < F < Cl < Br (4) I < Br < Cl < F

28. Which of the following sequence correctly represents the decreasing acid nature of oxides?
(1) $Li_2O > BeO > B_2O_3 > CO_2 > N_2O_3$
(2) $N_2O_3 > CO_2 > B_2O_3 > BeO > Li_2O$
(3) $CO_2 > N_2O_3 > B_2O_3 > BeO > Li_2O$
(4) $B_2O_3 > CO_2 > N_2O_3 > Li_2O > BeO$

29. The correct order of electron affinity of B, C, N, O is
(1) O > C > N > B (2) B > N > C > 0
(3) O > C > B > N (4) O > B > C > N

30. The correct order of reactivity of halogen is
(1) F > Cl > Br > I (2) F < Cl > Br < I
(3) F < Cl < Br < I (4) F < Cl < Br > I

31. Which of the following statement is correct with respect to the property of elements with an increase in atomic number in the carbon family (group 14)?
(1) Atomic size decrease
(2) Ionization energy increase
(3) Metallic character decrease
(4) Stability of +2 oxidation state increase

32. Match the following

List-I (Elements)	List-II (Valence shell Configuration)
A. Alkali metals	I. $n s^2 n p^6$
B. Alkaline earth metals	II. $n s^2 n p^5$
C. Halogens	III. $n s^2$
D. Noble gases	IV. $n s^1$

(1) A-I, B-II, C-III, D-IV
(2) A-IV, B-III, C-II, D-I
(3) A-II, B-I, C-III, D-IV
(4) A-IV, B-I, C-III, D-II

33. The electronic configuration of four elements are given below.
(i) $[Xe]\ 4f^{14}\ 5d^{10}\ 6s^2$
(ii) $[Kr]\ 4d^{10}\ 5s^2$
(iii) $[Ne]\ 3s^2\ 3p^5$
(iv) $[Ar]\ 3d^{10}\ 4s^2$
Which element does not belong to the same family?
(1) (i) (2) (ii)
(3) (iii) (4) (iv)

34. General electronic configuration of outermost and penultimate shell is $(n-1)\ S^2\ (n-1)\ p^6\ (n-1)\ dx\ ns^2$ If $n = 4$ and $x = 5$ then number of protons in the nucleus will be:
(1) >25 (2) <24
(3) 25 (4) 30

35. Which set does not show correct matching?
(1) Sc^{3+} [Ne] $3s^2\ 3p^6$ Zero group
(2) Fe^{2+} [Ar] $3\ d^6$ VIII group
(3) Cr[Ar] $3d^6 4s^1$ VIB group
(4) All of the above

36. Ionie radii are
(1) Directly proportional to effective nuclear charge
(2) Directly proportional to square of effective nuclear charge
(3) Inversely proportional to effective nuclear charge
(4) Inversely proportional to square of effective nuclear charge.

37. Identify the correct order of the size of the following:
(1) $Ca^{2+} < K^+ < Ar < S^{2-} < Cl^-$
(2) $Ca^{2+} < K^+ < Ar < Cl^- < S^{2-}$
(3) $Ar < Ca^{2+} < K^+ < Cl^- < S^{2-}$
(4) $Ca^{2+} < Ar < K^+ < Cl^- < S^{2-}$

38. Which of the following is correct order of increasing size?
(1) $Br^- > S^{2-} > Cl^- > Na^+ > Mg^{2+} > Be^{2+}$
(2) $Be^{2+} > Mg^{2+} > Na^+ > S^{2-} > Cl^+ > Br^-$
(3) $S^{2-} > Cl^- > Br^- > Na^+ > Mg^{2+} > Be^-$
(4) $Na^+ > Mg^{2+} > Be^{2+} < Br^- > S^{2-} > Cl^-$

39. Which one of the following indicates the correct order of atomic size?
(1) Be > F > C > Ne (2) Be < C < F < Ne
(3) Be > C > F > Ne (4) F < Ne < Be < C

40. Which one of the following elements has the highest ionisation energy?
(1) [Ne] $3s^2\ 3p^1$
(2) [Ne] $3s^2\ 3p^3$
(3) [Ne] $3s^2 3p^2$
(4) [Ar] $3d^{10}\ 4s^2 4p^2$

41. The incorrect statement among the following is
(1) The first ionisation potential of Al is less than the first ionisation potential of Mg
(2) The second ionisation potential of Mg is greater than the second ionisation potential of Na
(3) The first ionisation potential of Na is less than the first ionisation potential of Mg
(4) The third ionisation potential of Mg is greater than the third ionisation potential of Al

42. Arrange S, O and Se in ascending order of electron affinity.
(1) Se < S < O (2) Se < O < S
(3) S < O < Se (4) S < Se < O

43. In which of the following arrangements the order is NOT according to the property indicated against it.
(1) $Al^{3+} < Mg^{2+} < Na^+ < F^-$: Increasing ionic size
(2) B < C < N < 0 : Increasing first ionization enthalpy
(3) I < Br < F < Cl : Increasing electron gain enthalpy (with negative sign)
(4) Li < Na < K < Rb : Increasing metallic radius

44. Which one of the following arrangements represents the correct order of electron gain enthalpy (with negative sign) of the given atomic species?
(1) Cl < F < S < O
(2) O < S < F < Cl
(3) S < O < Cl < F
(4) F < Cl < O < S

45. In the periodic table, the metallic character of elements
(1) increases, (i) from left to right across a period and (ii) on descending a group
(2) decreases (i) from left to right across a period and (ii) on descending a group
(3) increases from left to right across a period and decreases on descending a group
(4) decreases from left to right across a period and increases on descending a group

46. Which of the following does not represent the correct order of the property indicated?
(1) $Sc^{3+} > Cr^{3+} > Fe^{3+} > Mn^{3+}$ (Ionic radii)
(2) Sc < Ti < Cr < Mn (Density)
(3) $Mn^{2+} > Ni^{2+} < Co^{2+} < Fe^{2+}$ (Ionic radii)
(4) FeO <CaO > MnO > CuO (Basic nature)

47. Which of the following sequence correctly represents the decreasing acidic nature of oxides?
(1) $Li_2O > BeO > CO_2 > N_2O_3 > B_2O_3$
(2) $CO_2 > N_2O_3 > B_2O_3 > Li_2O > BeO$
(3) $N_2O_3 > CO_2 > B_2O_3 > BeO > Li_2O$
(4) $CO_2 > BeO > Li_2O > B_2O_3 > N_2O_3$

48. Which one of the following is an incorrect statement?
(1) The ionisation potential of nitrogen is greater than that of oxygen.
(2) The ionisation potential of beryllium is greater than that of boron.
(3) The electron affinity of fluorine is greater than that of chlorine.
(4) The electronegativity of fluorine is greater than that of chlorine.

49. Considering the elements B, C, N, F and Si, the correct order of their non-metallic character is:
(1) B > C > Si > N > F
(2) Si > C > B > N > F
(3) F > N > C > B > Si
(4) F > N > C > Si > B

50. Considering the elements F, Cl, O correct order of their chemical reactivity in terms of oxidizing property is:
(1) F > Cl > O > N (2) F > O > Cl > N
(3) Cl > F > O > N (4) O > F > N > Cl

MATHS

51. If $a_1, a_2, a_3, \ldots$ are in A.P. such that $a_1 + a_5 + a_{10} + a_{15} + a_{20} + a_{24} = 225$, then $a_1 + a_2 + a_3 + \ldots + a_{24}$ is equal to
(1) 600 (2) 900
(3) 1200 (4) 1800

52. The first and last terms of an A.P. are 1 and 7. If the sum of its terms is 36, then the number of terms will be
(1) 6 (2) 7
(3) 8 (4) 9

53. The number of numbers lying between 81 and 1792 which are divisible by 17 is
(1) 105 (2) 107
(3) 109 (4) 101

54. If the sum of three numbers in A.P is 27 and the product of first and last is 77, then the numbers are
(1) $\frac{7}{2}, \frac{51}{4}, 22$ (2) 6, 9, 12
(3) 7, 10, 11 (4) 7, 9, 11

55. If three positive numbers a, b, c are in A.P. and $\frac{1}{a^2}, \frac{1}{b^2}, \frac{1}{c^2}$ also in A.P., then
(1) a = b = c (2) 2b = 3a + c
(3) $b^2 = \frac{ac}{8}$ (4) 2c = 2b + a

56. The maximum sum of the series 100 + 98 + 96 + ... is
(1) 2500 (2) 2550
(3) 2050 (4) 2555

57. Let t_r denote the rth term of an A.P. Also suppose
$t_m = \frac{1}{n}$ and $t_n = \frac{1}{m}$, $(m \neq n)$, for some positive integers m and n, then which of the following is necessarily a root of the equation ?
$(l+m-2n)x^2 + (m+n-2l)x + (n+l-2m)=0$
(1) t_n (2) t_m
(3) t_{m+n} (4) t_{mn}

58. If first and eighth terms of a G.P. are x^{-4} and x^{52} and its second term is x^t, then t is equal to
(1) 2 (2) 3
(3) 4 (4) 13

59. Let a_n be the n^{th} term of the G.P. of positive numbers. Let
$\sum_{n=1}^{100} a_{2n} = \alpha$ and $\sum_{n=1}^{100} a_{2n-1} = \beta$
Such that $\alpha \neq \beta$ then the common ratio is
(1) $\frac{\alpha}{\beta}$ (2) $\frac{\beta}{\alpha}$
(3) $\sqrt{\frac{\alpha}{\beta}}$ (4) $\sqrt{\frac{\beta}{\alpha}}$

60. If distinct positive numbers a, b, c are in G.P. and $\frac{1}{a-b}, \frac{1}{c-a}, \frac{1}{b-c}$ are in A.P., then the value of a + 4b + c is equal to
(1) –3 (2) 0
(3) 3 (4) 4

61. Let $b_i > 1$ for $i = 1, 2, ..., 101$. Suppose $\log_e b_1, \log_e b_2 \ldots \log_e b_{101}$ are in Arithmetic Progression (A.P.)with the common difference $\log_e 2$. Suppose $a_1, a_2, ..., a_{101}$ are in A.P. such that $a_1 = b_1$ and $a_{51} = b^{51}$. If $t = b_1 + b_2 + ... + b_{51}$ and $s = a_1 + a_2 + ... + a_{51}$, then
(1) s > t and $a_{101} > b_{101}$
(2) s > t and $a_{101} < b_{101}$
(3) s < t and $a_{101} > b_{101}$
(4) s < t and $a_{101} < b_{101}$

62. The sum of the roots of the equation $x + 1 - 2\log_2(3 + 2^x) + 2\log_4(10 - 2^{-x}) = 0$ is
(1) $\log_2 14$ (2) $\log_2 12$
(3) $\log_2 13$ (4) $\log_2 11$

63. The sum of all the solutions of the equation $(8)^{(2x)} - 16 \cdot (8)^x + 48 = 0$ is
(1) $1 + \log_6(8)$ (2) $\log_8(6)$
(3) $1 + \log_8(6)$ (4) $\log_8(4)$

64. If $a_1, a_2, a_3, ..., a_n$ are in A.P. and $a_1 + a_4 + a_7 + \ldots + a_{16} = 114$ then $a_1 + a_6 + a_{11} + a_{16}$ is equal to m5
(1) 64 (2) 38
(3) 76 (4) 98

65. The 20^{th} term from the end of the progression $20.19\frac{1}{4}, 18\frac{1}{2}, 17\frac{3}{4}, \ldots, -129\frac{1}{4}$ is
(1) -118 (2) -110
(3) -115 (4) -100

66. The 8^{th} common term of the series $S_1 = 3 + 7 + 11 + 15 + 19 + \ldots$ and $S_2 = 1 + 6 + 11 + 16 + 21 + ...$ is
(1) 125 (2) 151
(3) 130 (4) 115

67. Let $a_1, a_2, ..., a_{10}$ be a G.P.. If $a_3/a_1 = 25$ then a_9/a_5 equals
(1) $2(5^2)$ (2) $4(5^2)$
(3) 5^4 (4) 5^3

68. In an increasing geometric series, the sum of the second and the sixth term is 25/2 and the product of the third and fifth term is 25. Then, the sum of 4^{th}, 6^{th} and 8^{th} terms is equal to:
(1) 30 (2) 26
(3) 35 (4) 32

69. $25^{190} - 19^{190} - 8^{190} + 2^{190}$ is divisible by
(1) 14 but not by 34 (2) 34 but not by 14
(3) both 14 and 34 (4) neither 14 nor 34

70. If the sum of three numbers in A.P. is 24 and their product is 440, find the numbers.
(1) 6,8,9 (2) 2,3,8
(3) 5,8,11 (4) 7,8,9

71. Let $a_1, a_2, a_3, ..., a_{100}$ be an arithmetic progression with $a_1 = 3$ and $S_p = \sum_{i=1}^{P} a_i, 1 \le p \le 100$. For any integer n with $1 \le n \le 20$, let m = 5n. If $\frac{S_m}{S_n}$ does not depend on n, then a_2 is_____

72. Suppose that all the terms of an arithmetic progression (A.P.) are natural numbers. If the ratio of the sum of the first seven terms to the sum of the first eleven terms is 6 : 11 and the seventh term lies in between 130 and 140, then the common difference of this A.P. is_____

73. The sides of a right angled triangle are in arithmetic progression. If the triangle has area 24, then what is the length of its smallest side?_____

74. The number of solutions of the equation $\log_4(x - 1) = \log_2(x - 3)$ is_____

75. The value of $((\log_2 9)^2)^{\frac{1}{2\log_2(\log_2 9)}} \times (\sqrt{7})^{\frac{1}{\log_4 7}}$ is _____.