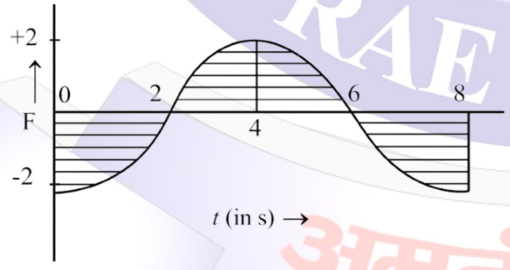
NEW STANDARD ACADEMY

Marks:300

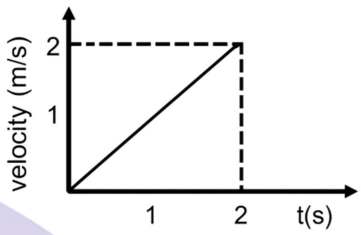
Date : 04-08-2026 **CLASS : 12TH JEE** **Time: 3 hours**

PHYSICS

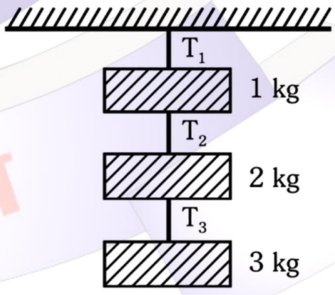
1. A material body A of mass m_1 exerts a force on another material body B of mass m_2. If the acceleration of B be a_2 , the magnitude of the acceleration of A is :-
   (1) Zero (2) m_2a_2 / m_1
   (3) m_1a_2 / m_2 (4) a_2
2. The velocity acquired by a mass m in travelling a certain distance d starting from rest under the action of a constant force is directly proportional to :-
   (1) $\sqrt{m}$ (2) m°
   (3) $1/\sqrt{m}$ (4) m
3. A balloon of mass M is descending with a constant acceleration g/3. When a mass m is released from the balloon it starts rising with the same acceleration g/3. The value of m is (Assuming that its volume does not change) :-
   (1) M/2 (2) M/4
   (3) 4M (4) 2M
4. Force-time graph for the motion of a body is shown in fig. Change in linear momentum between 0 to8 s is:-



   (1) Zero (3) 8 N-s
   (2) 4 N-s (4) None
1. For a body of 50 kg mass, the velocity-time graph is shown in figure. The force acting on the body is :

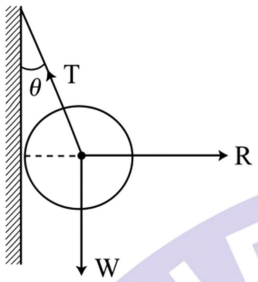


   (1) 25 N (2) 50 N
   (3) 12.5 N (4) 100 N
5. A satellite in force free space sweeps stationary interplanetary dust at a rate $\frac{dM}{dt} = +\alpha v$ Here v is the velocity. The acceleration of satellite of mass M is :-
   (1) $-2\alpha v^2 / M$ (2) $-3\alpha v^2 / M$
   (3) $-\alpha v^2/M$ (4) $-\alpha v^2$
6. A person is standing in an elevator. In which situation he finds his weight less?
   (1) when the elevator moves upward with constant acceleration
   (2) when the elevator moves downward with constant acceleration
   (3) when the elevator moves upward with uniform velocity
   (4) when the elevator moves downward with uniform velocity
7. Find the tension T_2 dagger the system shown in fig.



   (1) 1g N (2) 2g N
   (3) 5g N (4) 6g N
8. A metal sphere is hung by a string fixed to

a wall. The forces acting on the sphere are shown in fig. Which of the following statements is correct?



(a) $\vec{R}+\vec{T}+\vec{W}=0$ (b) $T^2 = R^2 + W^2$

(c) $T = R + W$ (d) $R = W \tan\theta$

(1) a, b, c (2) b, c, d

(3) a, b, d (4) a, b, c, d

9. Two particles of masses m and M (M > m) are connected by a cord that passes over a massless and frictionless pulley. The tension T in the string and the acceleration a of the particles is :-

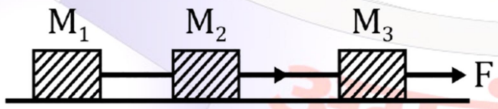
(1) $T=\frac{2mM}{(M-m)}g; a=\left(\frac{mM}{m+M}\right)g$

(2) $T=\frac{2mM}{(M+m)}g; a=\left(\frac{m-M}{m+M}\right)g$

(3) $T=\frac{M-m}{(M+m)}g; a=\left(\frac{2mM}{m+M}\right)g$

(4) $T=\frac{mM}{(M+m)}g; a=\left(\frac{2mM}{m+M}\right)g$

10. Three masses M_1, M_2 and M_3 are lying on a 2 frictionless table. The masses are connected by massless threads as shown. The mass M_3 is pulled by a constant force F as shown. The tension in the thread between masses M_2 and M_3 is



(1) $\left(\frac{M_1+M_2}{M_1+M_2+M_3}\right)F$ (2) $\left(\frac{M_2+M_3}{M_1+M_2+M_3}\right)F$

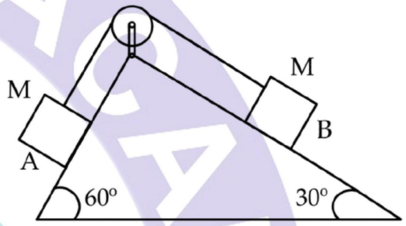
(3) $\left(\frac{M_1+M_3}{M_1+M_2+M_3}\right)F$ (4) $\left(\frac{M_1-M_2}{M_1+M_2+M_3}\right)F$

11. In the fig. given below masses m and m' are tied with a thread passing over a pulley, m is on a frictionless horizontal surface. If acceleration due to gravity is g, the acceleration of m' in this arrangement will be :-

(1) g (2) m'g/(m + m')

(3) mg/m' (4) mg / (m - m')

12. Two blocks each of mass M are resting on a frictionless inclined planes as shown in fig. then



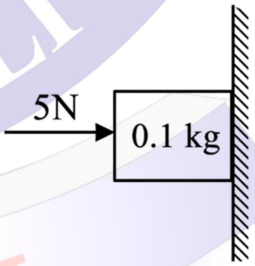
(1) The block A moves down the plane

(2) The block B moves down the plane

(3) Both the blocks remain at rest

(4) Both the blocks move down the plane.

13. A block of mass 0.1 kg. is pressed against a wall with a horizontal force of 5N as shown in the figure. If the coefficient of friction between the wall and the block is 0.5 then the frictional force acting on the block will be (g = 9.8 m/s2) :-

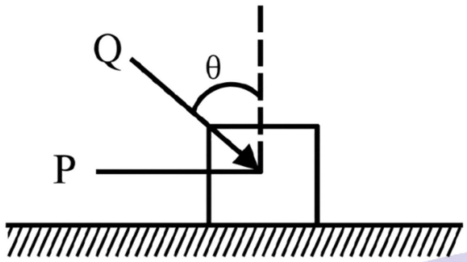


(1) 9.8 N (2) 2.5 N

(3) 0.98 N (4) 0.49 N

14. A block of mass m lying on a rough horizontal plane is acted upon by a horizontal force P and another force Q inclined at an angle e to the vertical. The block will remain in equilibrium if the coefficient of friction between it and the

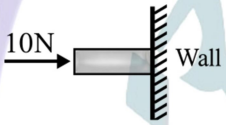
surface is :-



(1) $\frac{P+Q\sin\theta}{mg+Qcos\theta}$ (2) $\frac{Pcos\theta+Q}{mg-Qsin\theta}$

(3) $\frac{P+Q\cos\theta}{mg+Qsin\theta}$ (4) $\frac{P\sin\theta+Q}{mg+Qcos\theta}$

15. A horizontal force of 10 N is necessary to just hold a block stationary against a wall. The coefficient of friction between the block and wall is 0.2. The weight of the block is :-



(1) 20 N (2) 50 N

(3) 100 N (4) 2 N

16. A given object takes n times as much time to slide down a 45° rough incline as it takes to slide down a perfectly smooth 45° incline. The coefficient of kinetic friction between the object and the incline is given by: by

(1) $\left(1-\frac{1}{n^2}\right)$ (2) $\left(\frac{1}{1-n^2}\right)$

(3) $\sqrt{\left(1-\frac{1}{n^2}\right)}$ (4) $\sqrt{\left(\frac{1}{1-n^2}\right)}$

17. Mass particles of 1 kg each are placed along x-axis at x = 1, 2, 4, 8……..∞ Then gravitational force on a mass of 3kg placed at origin is (G = gravitational constant):-

(1) 4G (2) 4G/3

(3) 2G (4) ∞

18. Three identical bodies (each mass M) are placed at vertices of an equilateral triangle of arm L., keeping the triangle as such by which angular speed the bodies should be rotated in their gravitational fields so that the triangle moves along circumference of circular orbit:

(1) $\sqrt{\frac{3GM}{L^3}}$ (2) $\sqrt{\frac{GM}{L^3}}$

(3) $\sqrt{\frac{GM}{3L^3}}$ (4) $3\sqrt{\frac{GM}{L^3}}$

19. The value of 'g' reduces to half of its value at surface of earth at a height 'h', then :-

(1) h = R (2) h = 2R

(3) h = $(\sqrt{2}+1)$ R (4) h = $(\sqrt{2}-1)$ R

20. The acceleration due to gravity g and mean density of earth p are related by which of the following relations? [G = gravitational constant and R = radius of earth]:

(1) $\rho=\frac{4\pi gR^2}{3G}$ (2) $\rho=\frac{4\pi gR^3}{3G}$

(3) $\rho=\frac{3g}{4\pi GR}$ (4) $\rho=\frac{3g}{4\pi GR^3}$

21. A body attains a height equal to the radius of the earth when projected from earth' surface. The velocity of the body with which it was projected is:

(1) $\sqrt{\frac{GM}{R}}$ (2) $\sqrt{\frac{2GM}{R}}$

(3) $\sqrt{\frac{5}{4}\frac{GM}{R}}$ (4) $\sqrt{\frac{3GM}{R}}$

22. A particle falls from infinity to the earth. Its velocity on reaching the earth surface is:

(1) 2Rg (2) Rg

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

23. The ratio of radii of two satellites is p and the ratio of their acceleration due to gravity is q. The ratio of their escape velocities will be :

(1) $\left(\frac{q}{p}\right)^{1/2}$ (2) $\left(\frac{p}{q}\right)^{1/2}$

(3) pq (4) $\sqrt{pq}$

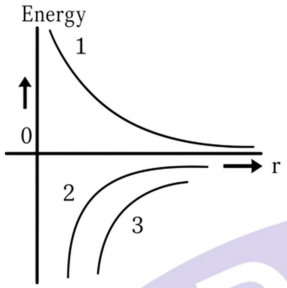
24. The earth revolves around the sun in one year. If distance between them becomes double, the new time period of revolution will be :-

(1) $4\sqrt{2}$ years (2) $2\sqrt{2}$ years

(3) 4 years (4) 8 years

25. A satellite is orbiting earth at a distance r. Variations of its kinetic energy, potential energy and total energy, is shown in the figure. Of the three curves shown in figure,

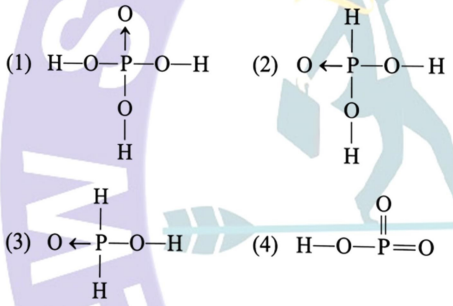
identify the type of mechanical energy they represent.



(1) 1 Potential, 2 Kinetic, 3 Total
(2) 1 Total, 2 Kinetic, 3 Potential
(3) 1 Kinetic, 2 Total, 3 Potential
(4) 1 Potential, 2 Total, 3 Kinetic

CHEMISTRY

26. The structure of orthophosphoric acid is



27. Which type of overlapping results in the formation of a π bond?
(1) Axial overlapping of s - s orbitals
(2) Lateral overlapping of p - p orbitals
(3) Axial overlapping of p - p orbitals
(4) Axial overlapping of s - p orbitals

28. Which of the following is incorrect statement(s)?
(1) $s + p_y \rightarrow$ sp-hybrid orbitals lying in the yz plane
(2) $s + p_x \rightarrow$ two sp-hybird orbitals lying in xz plane
(3) $s + p_x + p_z) \rightarrow$ three sp^2 hybrid orbitals lying in xz plane
(4) $(s + p_y) \rightarrow$two sp-hybrid orbitals lying along y-axis

29. Which is the correct order of the bond angle?
(1) NH3 $<NF_3$ (2) $H_2O > Cl_2O$
(3) $PH_3 < SbH_3$ (4) $H_2Te < H_2S$

30. Increasing order of dipole moments is given by
(1) $CF_4 < NH_3 < NF_3 < H_2O$
(2) $CF_4 < NH_3 < H_2O < NF_3$
(3) $CF_4 < NF_3 < H_2O < NH_3$
(4) $CF_4 < NF_3 < NH_3 < H_2O$

31. The hydrogen bonds are encountered in HF, H_2O, NH_3 and HF_2^- . The relative order of energies of hydrogen bonds is
(1) $HF > H_2O > H_3N > HF_2^-$,
(2) $H_2O > HF_2^-$, $> HF > NH_3$
(3) $HF > H\ F_2^-, > H_2O > NH_3$
(4) HF_2^-, $> HF > H_2O > NH_3$

32. Match List-I with List-II.

List-I	List-II
A. ICl	I. T-shape
B. ICl_3	II.Square pyramidal
C. ClF_5	III. Pentagonal bipyramidal
D. IF_7	IV.Linear

Choose the correct answer from the options given below:
(1) (A)-(IV), (B)-(I), (C)-(II), (D)-(III)
(2) (A)-(I), (B)-(IV), (C)-(III), (D)-(II)
(3) (A)-(I), (B)-(III), (C)-(II), (D)-(IV)
(4) (A)-(IV), (B)-(III), (C)-(II), (D)-(I)

33. The correct increasing order for bond angles among BF_3, PF_3 and ClF_3 is:
(1) $ClF_3 < PF_3 < BF_3$
(2) $BF_3 = PF_3 < ClF_3$
(3) $BF_3 < PF_3 < ClF_3$
(4) $PF_3 < BF_3 < ClF_3$

34. Match List - I with List - II.

List – I Molecule	List - II Shape
(A) BrF_5	(I) T-shape
(B) H_2O	(II) See saw
(C) ClF_3	(III) Bent
(D) SF_4	(IV) Square pyramidal

Choose the correct answer from the options given below:

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

35. The ionic radii (in Å) of N^{3-}, O^{2-} and $Fe^{\ominus}$ are respectively:
(1) 1.36, 1.40 and 1.71
(2) 1.36, 1.71 and 1.40
(3) 1.71, 1.40 and 1.36
(4) 1.71, 1.36 and 1.40

36. According to Molecular orbital theory,
(1) C_2^{2-} is expected to be diamagnetic
(2) O_2^{2+} is expected to have a long bond length than O_2
(3) N_2^+ and N_2^- have the same different bond order
(4) He_2^+ has the same energy as two isolated He atoms

37. Based on VSEPR model, match the xenon compounds given in List-I with the corresponding geometries and the number of lone pairs on xenon given in List-II and choose the correct option.

List-I	List-II
(P) XeF2	(1) Trigonal bipyramidal and two lone pair of electrons
(Q) XeF_4	(2) Tetrahedral and one lone pair of electrons
(R) XeO_3	(3) Octahedral and two lone pair of electrons
(S) XeO_3F_2	(4) Trigonal bipyramidal and no lone pair of electrons
	(5) Trigonal bipyramidal and three lone pair of electrons

(1) P-5, Q-2, R-3, S-1
(2) P-5, Q-3, R-2, S-4
(3) P-4, Q-3, R-2, S-1
(4) P-4, Q-2, R-5, S-3

38. Outermost electronic configuration of a group 13 element, E is $4s^24p^1$. The electronic configuration of an element of p-block period-five placed diagonally to element, E is:
(1) [Xe] $5d^{10}$ $6s^2$ $6p^2$
(2) [Ar] $3d^{10}$ $4s^2$ $4p^2$
(3) [Kr] $3d^{10}$ $4s^2$ $4p^2$
(4) [Kr] $4d^{10}$ $5s^2$ $5p^2$

39. The correct order of the ionic radii of O^{2-}, N^{3-}, F^-, Mg^{2+}, Na^+ and Al^{3+} is:
(1) $N^{3-} < F^- < O^{2-} < Mg^{2+} < Na^+ < Al^{3+}$
(2) $Al^{3+} < Mg^{2+} < Na^+ < F^- < O^{2-} < N^{3-}$
(3) $Al^{3+} < Na^+ < Mg^{2+} < O^{2-} < F^- < N^{3-}$
(4) $N^{3-} < O^{2-} < F^- < Na^+ < Mg^{2+} < Al^{3+}$

40. The correct increasing order of the ionic radii is
(1) $Ca^{2+} < K^+ < Cl^- < S^{2-}$
(2) $S^{2-} < Cl^- < Ca^{2+} < K^+$
(3) $K^+ < S^{2-} < Ca^{2+} < Cl^-$
(4) $Cl^- < Ca^{2+} < K^+ < S^{2-}$

41. Match List I with List II.

List I	List II
A. Melting Point [K]	I. T1 > In > Ga > A1 > B
B. Ionic Radius [M^{3+}/pm]	II.B > T1 > A1 ≈ Ga >ln
C.Δ_iH_1[kJmol^{-1}]	III. T1 > In > A1 > Ga > B
D.Atomic Radius [pm]	IV.B > A1 > T1 > In > Ga

Choose the correct answer from the options given below:
(1) A-IV, B-I, C-II, D-III
(2) A-II, B-III, C-IV, D-I
(3) A-III, B-IV, C-I, D-II
(4) A-I, B-II, C-III, D-IV

42. Which of the following represents the correct order of increasing first ionization enthalpy for Ca, Ba, S, Se, and Ar?
(1) Ca<S<Ba< Se <Ar
(2) S <Se<Ca< Ba< Ar
(3) Ba<Ca< Se<S <Ar
(4) Ca< Ba<S <Se < Ar

43. In comparison to boron, beryllium has:
(1) lesser nuclear charge and greater first

ionisation enthalpy
(2) lesser nuclear charge and lesser first ionisation enthalpy
(3) greater nuclear charge and greater first ionisation enthalpy
(4) greater nuclear charge and lesser first ionisation energy

44. Consider the elements Mg, Al, S, P and Si, the correct increasing order of their first ionization enthalpy is
(1) Mg < Al < Si < S < P
(2) Al < Mg < Si < S < P
(3) Mg < Al < Si < P < S
(4) Al < Mg < S < Si < P

45. Match List-I with List-II

List-I Electronic configuration of elements	List-II $\Delta_i H$ in kJ mol^{-1}
(a) $1s^2 2s^2$	(i) 801
(b) $1s^2 2s^2 2p^4$	(ii) 899
(c) $1s^2 2s^2 2p^3$	(iii) 1314
(d) $1s^2 2s^2 2p^1$	(iv) 1402

Choose the most appropriate answer from the options given below:
(1) (a) → (ii), (b) → (iii), (c) → (iv), (d) → (i)
(2) (a) → (i), (b) → (iv), (c) → (iii), (d) → (ii)
(3) (a) → (i), (b) → (iii), (c) → (iv), (d) → (ii)
(4) (a) → (iv), (b) → (i), (c) → (ii), (d) → (iii)

46. The first ionization energy of magnesium is smaller as compared to that of elements X and Y, but higher than that of Z. The elements X, Y and Z, respectively, are:
(1) chlorine, lithium and sodium
(2) argon, lithium and sodium
(3) argon, chlorine and sodium
(4) neon, sodium and chlorine

47. The incorrect statement is
(1) The first ionization enthalpy of K is less than that of Na and Li
(2) Xe does not have the lowest first ionization enthalpy in its group.
(3) The first ionization enthalpy of element with atomic number 37 is lower than that ofthe element with atomic number 38.
(4) The first ionization enthalpy of Ga is higher than that of the d-block element with atomic number 30.

48. For elements B, C, N, Li, Be, O and F, the correct order of
first ionization enthalpy is
(1) Li<Be <B<C<O<N<F
(2) Li Be <B<C<N<O<F
(3) Li<B<Be<C<O<N<F
(4) B > Li > Be > C > N > O>F

49. The correct order of electron gain enthalpy is:
(1) S > Se > Te > 0
(2) Te > Se > S > 0
(3) O > S > Se > Te
(4) S > 0 > Se > Te

50. Given below are two statements:
Statement (I): The oxidation state of an element in a particular compound is the charge acquired by its atom on the basis of electron gain enthalpy consideration from other atoms in the molecule.
Statement (II): $p\pi$-$p\pi$ bond formation is more prevalent in second period elements over other periods.
In the light of the above statements, choose the most appropriate answer from the options given below:
(1) Both Statement I and Statement II are incorrect
(2) Both Statement I and Statement II are correct
(3) Statement I is incorrect but Statement II is correct
(4) Statement I is correct but Statement II is incorrect

MATHS

51. The sides of an equilateral triangle are increasing at the rate of 2 cm/sec. The rate at which its area increases, when side is 10

cm, is

(1) 10 cm²/sec (2) $10\sqrt{3}$ cm^2 /sec

(3) 10/3 cm²/sec (4) $\sqrt{3}$ c m ^{2} /sec

52. The interval on which the function f(x) = $2x^3 + 9x^2 + 12x - 1$ is decreasing is

(1) [- 1, ∞) (2) (- ∞, - 2]

(3) [-2,-1] (4) [-1,1]

53. The function f(x) = x^x, $x > 0$, is increasing on the interval

(1) (0, e] (2) $(0,\frac{1}{e})$

(3) $\left[\frac{1}{e}, \quad\right)\infty$ (d) none of these

54. If function f: R⟶R is defined by f(x) = 2x + cos x then

(1) *f* has a minimum at x = π

(2) has a maximum at x = 0

(3) *f* is a decreasing function

(4) *f* is an increasing function

55. The function f(x) = $x^3 - 3x^2 + 12x - 18$ is

(1) strictly increasing on R

(2) strictly decreasing on R

(3) neither strictly increasing nor strictly decreasing on R

(4) strictly decreasing on (- ∞, 0)

56. If $\sec^4\theta + \sec^2\theta = 10 + \tan^4\theta + \tan^2\theta$ then $\sin^2\theta$ =

(1) 2/3 (2) 3/4

(3) 4/5 (4) 5/6

57. If sin A = sin² B and 2 cos² A = 3 cos² B then the triangle ABC is

(1) right angled (2) obtuse angled

(3) isosceles (4) equilateral

58. The greatest value of $\sin^4\theta + \cos^4\theta$ is

(1) 1/2 (2) 1

(3) 2 (4) 3

59. If cos 28° + sin 28° = k^3 then cos 17° is equal to

(1) $k^3/\sqrt{2}$ (2) - $k^3/\sqrt{2}$

(3) $\pm$ $k^3/\sqrt{2}$ (4) none of these

60. If A and B are acute positive angles satisfying the equations $3\sin^2 A + 2\sin^2 B = 1$ and 3 sin 2A - 2sin 2B = 0, then A + 2B is equal to

(1) π (2) π /2

(3) π /4 (4) π /6

61. The set of value(s) of a for which the function $f(x) = \frac{ax^3}{3} + (a+2)x^2 + (a-1)x + 2$ possesses a negative point of inflection is

(1) (- ∞, - 2) ∪(0, ∞) (2) {- 4/5}

(3) (-2,0) (4) empty set

62. The global maximum value of $f(x) = \log_{10}(4x^3 - 12x^2 + 11x - 3)$, x ∈ [2, 3], is

(1) $-\frac{3}{2}\log_{10}3$ (2) $1 + \log_{10} 3$

(3) $\log_{10} 3$ (4) $\frac{3}{2}\log_{10}3$

63. For the function *f*(x) = (cos x) - x + 1 , x ∈ R between the following two statements

(S1): f(x) = 0 for only one value of x is $[0, \pi]$.

(S2): f(x) is decreasing in $[0, \pi/2]$ and increasing in $[\pi/2, \pi]$

(1) Only (S2) is correct

(2) Both (S1) and (S2) are incorrect

(3) Only (S1) is correct

(4) Both (S1) and (S2) are correct

64. The maximum value of $x^4e^{-x^2}$ is

(1) e^2 (2) e^{-2}

(3) $12e^{-2}$ (4) $4e^{-2}$

65. A rectangle of the greatest area is inscribed in a trapezium ABCD, one of whose non-parallel sides AB is perpendicular to the base, so that one of the rectangle's side lies on the larger base of the trapezium. The base of trapezium are 6 cm and 10 cm and AB is 8 cm long. Then the maximum area of the rectangle is

(1) 24cm ^{2} (2) 48cm^2

(3) 36cm^2 (4) none of these

66. cosec18° is a root of the equation

(1) $x^2 + 2x - 4 = 0$ (2) $4x^2 + 2x - 1 = 0$

(3) $x^2 - 2x - 4 =$ (4) $x^2 - 2x + 4 = 0$

67. The maximum value of of $3\cos\theta + 5\sin\left(\theta - \frac{\pi}{6}\right)$ for any real value of θ is

(1) $\sqrt{19}$ (2) $\frac{\sqrt{79}}{2}$

(3) $\sqrt{31}$ (4) $\sqrt{34}$

68. A spherical iron ball of radius 10 cm is coated with a layer of ice of uniform thickness that melts at a rate of $50cm^3$/min When the thickness of the ice is 5 cm then the rate at which the thickness (in cm / min) of ice decreases is

(1) $1/18\pi$ (2) $1/36\,\pi$

(3) $1/9\,\pi$ (4) $5/6\,\pi$

69. If *f(x)* is a non-zero polynomial of degree four, having local extreme points at x = -1, 0, 1 ; then the set S ={ x ∈ R: *f(x)* = *f(0)* } contains exactly

(1) two irrational and one rational number

(2) four irrational numbers

(3) four rational numbers

(4) two irrational and two rational numbers

70. Let S = $\{\sin^2 2\theta : (\sin^4\theta + \cos^2\theta)x^2 + (\sin^2\theta)x + (\sin^6\theta + 6\cos^6\theta) = 0$ has real roots$\}$. If α and β be the smallest and largest elements of the set S, respectively, then $3((\alpha - 2)^2 + (\beta - 1)^2)$ equals_____

71. The number of points, where the curve $y = x^5 - 20x^3 + 50x + 2$ crosses the x-axis, is _____

72. The value of $\frac{\sqrt{3}cosec\,20° - sec2\,°}{\cos 20°\cos 40°\cos 60°\cos 80°}$ is equal to_____

73. Let P $\{\theta\epsilon[0, 4\pi]: \tan^2\theta \neq 1\}$ and S={ a∈ $\mathbb{Z}$: $2\,(cos^8\theta - sin^8\theta)\,\sec 2\,\theta = a^2.\theta \in P\}$.Then n(S) is_____

74. If $\sin x + \sin^2 x = 1$, $x \in \left(0, \frac{\pi}{2}\right)$,then $(cos^{12} x + tan^{12} x) + 3(cos^{10} x + tan^{10} x + cos^8 x + tan^8 x) + (cos^6 x + tan^6 x)$ is equal to_____

75. If for $\theta\epsilon\left[-\frac{\pi}{3}, 0\right]$ the points (x, y) = $(3\tan\left(\theta + \frac{\pi}{3}\right), 2\tan\left(\theta + \frac{\pi}{3}\right))$ lie on $xy + \alpha x + \beta y + \gamma = 0$ then $\alpha^2 + \beta^2 + \gamma^2$ is equal to: _____