



**PHYSICS
WALLAH**

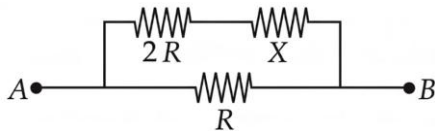
JEE MAIN 2026

SESSION-01

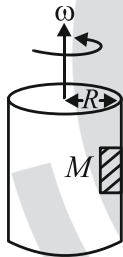
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Shift-02

10. Two known resistances of $R\Omega$ and $2R\Omega$ and one unknown resistance $X\Omega$ are connected in a circuit as shown in the figure. If the equivalent resistance between points A and B in the circuit is $X\Omega$, then the value of X is _____ Ω .



- (1) R (2) $(\sqrt{3}-1)R$
 (3) $(\sqrt{3}+1)R$ (4) $2(\sqrt{3}-1)R$
11. A battery with EMF E and internal resistance r is connected across a resistance R . The power consumption in R will be maximum when :
- (1) $R = 2r$ (2) $R = \frac{r}{2}$
 (3) $R = r$ (4) $R = \sqrt{2}r$
12. A large drum having radius R is spinning around its axis with angular velocity ω , as shown in figure. The minimum value of ω so that a body of mass M remains stuck to the inner wall of the drum, taking the coefficient of friction between the drum surface and mass M as μ , is :

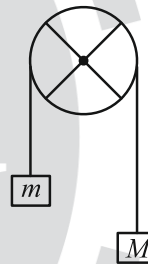


- (1) $\sqrt{\frac{g}{2\mu R}}$ (2) $\sqrt{\frac{\mu g}{R}}$
 (3) $\sqrt{\frac{g}{\mu R}}$ (4) $\sqrt{\frac{2g}{\mu R}}$
13. A river of width 200 m is flowing from west to east with a speed of 18 km/h. A boat, moving with speed of 36 km/h in still water, is made to travel one-round trip (bank to bank of the river). Minimum time taken by the boat for this journey and also the displacement along the river bank are _____ and _____ respectively.
- (1) 20 s and 100 m
 (2) 40 s and 200 m
 (3) 40 s and 100 m
 (4) 40 s and 0 m
14. A capacitor C is first charged fully with potential difference of V_0 and disconnected from the battery. The charged capacitor is connected across an inductor having inductance L . In t s, 25% of the

initial energy in the capacitor is transferred to the inductor. The value of t is _____ s.

- (1) $\pi\sqrt{\frac{LC}{2}}$ (2) $\frac{\pi\sqrt{LC}}{6}$
 (3) $\frac{\pi\sqrt{LC}}{3}$ (4) $\frac{\pi\sqrt{LC}}{2}$

15. The r.m.s. speed of oxygen molecules at 47°C is equal to that of the hydrogen molecules kept at _____ $^\circ\text{C}$. (Mass of oxygen molecule/mass of hydrogen molecule = 32/2)
- (1) -235 (2) -20
 (3) -253 (4) -100
16. The pulley shown in figure is made using a thin rim and two rods of length equal to diameter of the rim. The rim and each rod have a mass of M . Two blocks of mass M and m are attached to two ends of a light string passing over the pulley, which is hinged to rotate freely in vertical plane about its center. The magnitudes of the acceleration experienced by the blocks is _____ (assume no slipping of string on pulley).



- (1) $\frac{(M-m)g}{2M+m}$ (2) $\frac{(M-m)g}{M+m}$
 (3) $\frac{(M-m)g}{\left[\left(\frac{8}{3}\right)M+m\right]}$ (4) $\frac{(M-m)g}{\left[\left(\frac{13}{6}\right)M+m\right]}$
17. Given below are two statements :
- Statement I:** In a Young's double slit experiment, the angular separation of fringes will increase as the screen is moved away from the plane of the slits
- Statement II:** In a Young's double slit experiment, the angular separation of fringes will increase when monochromatic source is replaced by another monochromatic source of higher wavelength
- In the light of the above statements, choose the correct answer from the options given below :
- (1) Statement I is true but Statement II is false
 (2) Both Statement I and Statement II are false
 (3) Both Statement I and Statement II are true
 (4) Statement I is false but Statement II is true

18. A body of mass 2 kg is moving along x-direction such that its displacement as function of time is given by $x(t) = (\alpha t^2 + \beta t + \gamma) \text{ m}$, where $\alpha = 1 \text{ m/s}^2$, $\beta = 1 \text{ m/s}$ and $\gamma = 1 \text{ m}$. The work done on the body during the time interval $t = 2 \text{ s}$ to $t = 3 \text{ s}$, is _____ J.
- (1) 42 (2) 12
(3) 24 (4) 49
19. Surface tension of two liquids (having same densities), T_1 and T_2 , are measured using capillary rise method utilizing two tubes with inner radii of r_1 and r_2 where $r_1 > r_2$. The measured liquid heights in these tubes are h_1 and h_2 respectively. [Ignore the weight of the liquid about the lowest point of meniscus]. The heights h_1 and h_2 and surfaces tensions T_1 and T_2 satisfy the relation:
- (1) $h_1 = h_2$ and $T_1 = T_2$
(2) $h_1 < h_2$ and $T_1 = T_2$
(3) $h_1 > h_2$ and $T_1 < T_2$
(4) $h_1 > h_2$ and $T_1 = T_2$
20. The kinetic energy of a simple harmonic oscillator is oscillating with angular frequency of 176 rad/s. The frequency of this simple harmonic oscillator is _____ Hz. [take $\pi = \frac{22}{7}$]
- (1) 28 (2) 88
(3) 176 (4) 14

Integer Type Questions

21. In a Young's double slit experiment set up, the two slits are kept 0.4 mm apart and screen is placed at 1 m from slits. If a thin transparent sheet

of thickness 20 μm is introduced in front of one of the slits, then central bright fringe shifts by 20 mm on the screen. The refractive index of transparent sheet is given by $\frac{\alpha}{10}$, where α is _____.

22. A diatomic gas ($\gamma = 1.4$) does 100 J of work when it is expanded isobarically. Then the heat given to the gas is _____ J.
23. An electromagnetic wave of frequency 100 MHz propagates through a medium of conductivity, $\sigma = 10 \text{ mho/m}$. The ratio of maximum conduction current density to maximum displacement current density is _____. [Take $\frac{1}{4\pi\epsilon_0} = 9 \times 10^9 \text{ Nm}^2/\text{C}^2$]
24. A particle having electric charge $3 \times 10^{-19} \text{ C}$ and mass $6 \times 10^{-27} \text{ kg}$ is accelerated by applying an electric potential of 1.21 V. Wavelength of the matter wave associated with the particle is $\alpha \times 10^{-12} \text{ m}$. The value of α is _____ (Take Planck's constant = $6.6 \times 10^{-34} \text{ J.s}$)
25. The terminal velocity of a metallic ball of radius 6 mm in a viscous fluid is 20 cm/s. The terminal velocity of another ball of same material and having radius 3 mm in the same fluid will be _____ cm/s.

SECTION-II (CHEMISTRY)

Single Correct Type Questions

26. Decomposition of A is a first order reaction at T(K) and is given by $A(g) \longrightarrow B(g) + C(g)$. In a closed 1 L vessel, 1 bar A(g) is allowed to decompose at T(K). After 100 minutes, the total pressure was 1.5 bar. What is the rate constant (in min^{-1}) of the reaction? ($\log 2 = 0.3$)
- (1) 6.9×10^{-3}
(2) 6.9×10^{-1}
(3) 6.9×10^{-4}
(4) 6.9×10^{-2}
27. Given below are some of the statements about Mn and Mn_2O_7 . Identify the correct statements.

- A. Mn forms the oxide Mn_2O_7 , in which Mn is in its highest oxidation state.
B. Oxygen stabilizes the Mn in higher oxidation states by forming multiple bonds with Mn.
C. Mn_2O_7 is an ionic oxide.
D. The structure of Mn_2O_7 consists of one bridged oxygen.

Choose the correct answer from the options given below :

- (1) A, B and C Only
(2) A, B and D Only
(3) A, B, C and D
(4) A, C and D Only

28. Given below are two statements :

Statement I: The correct order in terms of bond dissociation enthalpy is $\text{Cl}_2 > \text{Br}_2 > \text{F}_2 > \text{I}_2$.

Statement II: The correct trend in the covalent character of the metal halides is

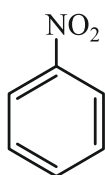
$[\text{SnCl}_4 > \text{SnCl}_2], [\text{PbCl}_4 > \text{PbCl}_2]$ and

$[\text{UF}_4 > \text{UF}_6]$.

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

- (1) Both Statement I and Statement II are true
- (2) Statement I is false but Statement II is true
- (3) Statement I is true but Statement II is false
- (4) Both Statement I and Statement II are false

29.



(1) $\text{Br}_2/\text{FeBr}_3/\Delta$

(2) $\text{Sn}/\text{HCl}/\Delta$

→ Major Product (P)

(3) pH neutralisation

(4) $\text{Br}_2/\text{H}_2\text{O}$

(5) $\text{NaNO}_2/\text{HBr}, 0-5^\circ\text{C}$

(6) CuBr/NaBr

Consider the above sequence of reactions. The number of bromine atom(s) in the final product (P) will be :

- (1) 1
- (2) 5
- (3) 6
- (4) 3

30. Given below are two statements :

Statement I : The correct order in terms of atomic/ionic radii is $\text{Al} > \text{Mg} > \text{Mg}^{2+} > \text{Al}^{3+}$.

Statement II: The correct order in terms of the magnitude of electron gain enthalpy is $\text{Cl} > \text{Br} > \text{S} > \text{O}$.

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

- (1) Statement I is true but Statement II is false
- (2) Both Statement I and Statement II are false
- (3) Both Statement I and Statement II are true
- (4) Statement I is false but Statement II is true

31. The correct statements are :

- A. Activation energy for enzyme catalysed hydrolysis of sucrose is lower than that of acid catalysed hydrolysis.
- B. During denaturation, secondary and tertiary structures of a protein are destroyed but primary structure remains intact.

C. Nucleotides are joined together by glycosidic linkage between C_1 and C_4 carbons of the pentose sugar.

D. Quaternary structure of proteins represents overall folding of the polypeptide chain.

Choose the correct answer from the options given below :

- (1) A, C and D Only
- (2) B and C Only
- (3) A, B and D Only
- (4) A and B Only

32. The correct increasing order of

$\text{C}-\text{H}(\text{A}), \text{C}-\text{O}(\text{B}), \text{C}=\text{O}(\text{C})$ and $\text{C}\equiv\text{N}(\text{D})$

bonds in terms of covalent bond length is:

- (1) $\text{D} < \text{C} < \text{B} < \text{A}$
- (2) $\text{A} < \text{B} < \text{C} < \text{D}$
- (3) $\text{D} < \text{C} < \text{A} < \text{B}$
- (4) $\text{A} < \text{D} < \text{C} < \text{B}$

33. Match Lis-I with List-II.

List-I Reagents		List-II Reaction Name (Involving aldehydes)	
A	$\text{H}_2, \text{Pd}-\text{BaSO}_4$	I	Etard Reaction
B	$\text{SnCl}_2, \text{HCl}$	II	Rosenmund Reduction
C	$\text{CrO}_2\text{Cl}_2, \text{CS}_2$	III	Gatterman - Koch Reaction
D	$\text{CO}, \text{HCl}, \text{Anhyd. AlCl}_3$	IV	Stephen Reaction

Choose the correct answer from the options given below :

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

34. Consider the following data:

$\Delta_f H^\ominus$ (methane, g) = $-X \text{ kJmol}^{-1}$

Enthalpy of sublimation of graphite = $Y \text{ kJmol}^{-1}$

Dissociation enthalpy of $\text{H}_2 = Z \text{ kJ mol}^{-1}$

The bond enthalpy of $\text{C}-\text{H}$ bond is given by :

- (1) $X+Y+Z$
- (2) $\frac{X+Y+2Z}{4}$
- (3) $\frac{X+Y+4Z}{2}$
- (4) $\frac{-X+Y+Z}{4}$

35. Match Lis-I with List-II.

List - I Pair of Compounds		List - II Type of Isomers	
A	2-Methylpropene and but-1-ene	I	Stereoisomers
B	Cis-but-2-ene and trans-but-2-ene	II	Position isomers
C	2-Butanol and diethyl ether	III	Chain isomers
D	But-1-ene and but-2-ene	IV	Functional group isomers

Choose the correct answer from the options given below :

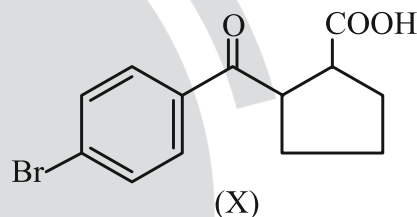
- (1) A-II, B-I, C-IV, D-III
 (2) A-III, B-I, C-IV, D-II
 (3) A-III, B-I, C-II, D-IV
 (4) A-I, B-IV, C-III, D-II
36. Aqueous HCl reacts with $\text{MnO}_2(\text{s})$ to form $\text{MnCl}_2(\text{aq})$, $\text{Cl}_2(\text{g})$ and $\text{H}_2\text{O}(\text{l})$. What is the weight (in g) of Cl_2 liberated when 8.7 g of $\text{MnO}_2(\text{s})$ is reacted with excess aqueous HCl solution ? (Given Molar mass in g mol^{-1} Mn = 55, Cl = 35.5, O = 16, H = 1)
- (1) 7.1
 (2) 14.2
 (3) 21.3
 (4) 71
37. The correct order of the rate of the reaction for the following reaction with respect to nucleophiles is :
- $$\text{CH}_3\text{Br} + \text{Nu}^- \longrightarrow \text{CH}_3\text{Nu} + \text{Br}^-$$
- (1) $\text{CH}_3\text{COO}^- > \text{PhO}^- > ^-\text{OH} > \text{ClO}_4^-$
 (2) $\text{ClO}_4^- > \text{CH}_3\text{COO}^- > ^-\text{OH} > \text{PhO}^-$
 (3) $\text{PhO}^- > ^-\text{OH} > \text{CH}_3\text{COO}^- > \text{ClO}_4^-$
 (4) $^-\text{OH} > \text{PhO}^- > \text{CH}_3\text{COO}^- > \text{ClO}_4^-$
38. On heating a mixture of common salt and $\text{K}_2\text{Cr}_2\text{O}_7$ in equal amount along with concentrated H_2SO_4 in a test tube, a gas is evolved. Formula of the gas evolved and

oxidation state of the central metal atom in the gas respectively are:

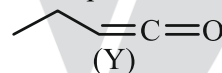
- (1) CrO_2Cl_2 and +5
 (2) CrO_2Cl_2 and +6
 (3) $\text{Cr}_2\text{O}_2\text{Cl}_2$ and +6
 (4) $\text{Cr}_2\text{O}_2\text{Cl}_2$ and +3
39. By usual analysis, 1.00 g of compound (X) gave 1.79 g of magnesium pyrophosphate. The percentage of phosphorus in compound (X) is : (nearest integer)
 (Given, molar mass in g mol^{-1} : O = 16, Mg = 24, P = 31)
- (1) 30
 (2) 50
 (3) 40
 (4) 20

40. Given below are two statements :

Statement I: Compound (X), shown below, dissolves in NaHCO_3 solution and has two chiral atoms.



Statement II: Compound (Y), shown below, has two carbons with sp^3 hybridization, one carbon with sp^2 and one carbon with sp hybridization



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

- (1) Statement I is false but Statement II is true
 (2) Both Statement I and Statement II are false
 (3) Statement I is true but Statement II is false
 (4) Both Statement I and Statement II are true
41. The correct order of reactivity of the following benzyl halides towards reaction with KCN is :
- a

b

c

d
- (1) $a > b > c > d$
 (2) $a > b > d > c$
 (3) $b > a > d > c$
 (4) $b > a > c > d$

SECTION-III (MATHEMATICS)

Single Correct Type Questions

51. If the area of the region $\{(x, y) : 1 - 2x \leq y \leq 4 - x^2, x \geq 0, y \geq 0\}$ is $\frac{\alpha}{\beta}$, $\alpha, \beta \in \mathbb{N}$, $\gcd(\alpha, \beta) = 1$, then the value of $(\alpha + \beta)$ is :
- (1) 73 (2) 85
(3) 67 (4) 91
52. Let $A = \{x : |x^2 - 10| \leq 6\}$ and $B = \{x : |x - 2| > 1\}$. Then
- (1) $A - B = [2, 3)$
(2) $A \cup B = (-\infty, 1] \cup (2, \infty)$
(3) $B - A = (-\infty, -4) \cup (-2, 1) \cup (4, \infty)$
(4) $A \cap B = [-4, -2] \cup [3, 4]$
53. For a triangle ABC , let $\vec{p} = \overrightarrow{BC}$, $\vec{q} = \overrightarrow{CA}$ and $\vec{r} = \overrightarrow{BA}$. If $|\vec{p}| = 2\sqrt{3}$, $|\vec{q}| = 2$ and $\cos\theta = \frac{1}{\sqrt{3}}$, where θ is the angle between \vec{p} and \vec{q} , then $|\vec{p} \times (\vec{q} - 3\vec{r})|^2 + 3|\vec{r}|^2$ is equal to:
- (1) 200 (2) 220
(3) 340 (4) 410
54. Let $f(x) = x^3 + x^2 f'(1) + 2x f''(2) + f'''(3)$, $x \in \mathbb{R}$. Then the value of $f'(5)$ is :
- (1) $\frac{62}{5}$ (2) $\frac{657}{5}$
(3) $\frac{117}{5}$ (4) $\frac{2}{5}$
55. Let α and β be the roots of the equation $x^2 + 2ax + (3a + 10) = 0$ such that $\alpha < 1 < \beta$. Then the set of all possible values of a is :
- (1) $(-\infty, -3)$
(2) $(-\infty, -2) \cup (5, \infty)$
(3) $\left(-\infty, \frac{-11}{5}\right)$
(4) $\left(-\infty, \frac{-11}{5}\right) \cup (5, \infty)$
56. The positive integer n , for which the solutions of the equation $x(x+2) + (x+2)(x+4) + \dots + (x+2n-2)(x+2n) = \frac{8n}{3}$ are two consecutive even Integers, is:
- (1) 3 (2) 9
(3) 12 (4) 6
57. If the system of equations $3x + y + 4z = 3$
 $2x + \alpha y - z = -3$
 $x + 2y + z = 4$ has no solution, then the value of α is equal to :
- (1) 13 (2) 23
(3) 19 (4) 4
58. Let z be the complex number satisfying $|z - 5| \leq 3$ and having maximum positive principal argument. Then $34 \left| \frac{5z - 12}{5iz + 16} \right|^2$ is equal to :
- (1) 12 (2) 16
(3) 26 (4) 20
59. Let the line L pass through the point $(-3, 5, 2)$ and make equal angles with the positive coordinate axes. If the distance of L from the point $(-2, r, 1)$ is $\sqrt{\frac{14}{3}}$, then the sum of all possible values of r is:
- (1) 10 (2) 6
(3) 12 (4) 16
60. The largest $n \in \mathbb{N}$, for which 7^n divides $101!$, is:
- (1) 19 (2) 16
(3) 15 (4) 18
61. Let $f: \mathbb{R} \rightarrow \mathbb{R}$ be a twice differentiable function such that $f''(x) > 0$ for all $x \in \mathbb{R}$ and $f'(a-1) = 0$, where a is a real number. Let $g(x) = f(\tan^2 x - 2\tan x + a)$, $0 < x < \frac{\pi}{2}$. Consider the following two statements :
- (I) g is increasing in $\left(0, \frac{\pi}{4}\right)$
(II) g is decreasing in $\left(\frac{\pi}{4}, \frac{\pi}{2}\right)$
- Then,
- (1) Both (I) and (II) are True
(2) Neither (I) nor (II) is True
(3) Only (I) is True
(4) Only (II) is True

62. Let the line L_1 be parallel to the vector $-3\hat{i} + 2\hat{j} + 4\hat{k}$ and pass through the point (2, 6, 7), and the line L_2 be parallel to the vector $2\hat{i} + \hat{j} + 3\hat{k}$ and pass through the point (4, 3, 5). If the line L_3 is parallel to the vector $-3\hat{i} + 5\hat{j} + 16\hat{k}$ and intersects the lines L_1 and L_2 at the points C and D, respectively, then $|\overline{CD}|^2$ is equal to:
- (1) 290 (2) 171
(3) 89 (4) 312

63. Let $y = y(x)$ be the solution of the differential equation $\sec x \frac{dy}{dx} - 2y = 2 + 3\sin x, x \in \left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$, $y(0) = -\frac{7}{4}$. Then $y\left(\frac{\pi}{6}\right)$ is equal to :
- (1) $-3\sqrt{2} - 7$ (2) $-\frac{5}{2}$
(3) $-\frac{5}{4}$ (4) $-3\sqrt{3} - 7$

64. Let one end of a focal chord of the parabola $y^2 = 16x$ be (16, 16). If $P(\alpha, \beta)$ divides this focal chord internally in the ratio 5 : 2, then the minimum value of $\alpha + \beta$ is equal to :
- (1) 22 (2) 7
(3) 16 (4) 5

65. A random variable X takes values 0, 1, 2, 3 with probabilities $\frac{2a+1}{30}, \frac{8a-1}{30}, \frac{4a+1}{30}, b$ respectively, where $a, b \in R$. Let μ and σ respectively be the mean and standard deviation of X such that $\sigma^2 + \mu^2 = 2$. Then $\frac{a}{b}$ is equal to :
- (1) 3 (2) 60
(3) 12 (4) 30

66. For the matrices $A = \begin{bmatrix} 3 & -4 \\ 1 & -1 \end{bmatrix}$ and $B = \begin{bmatrix} -29 & 49 \\ -13 & 18 \end{bmatrix}$, if $(A^{15} + B) \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \end{bmatrix}$, then among the following which one is true?
- (1) $x = 11, y = 2$
(2) $x = 16, y = 3$
(3) $x = 5, y = 7$
(4) $x = 18, y = 11$

67. If the line $\alpha x + 4y = \sqrt{7}$, where $\alpha \in R$, touches the ellipse $3x^2 + 4y^2 = 1$ at the point P in the first quadrant, then one of the focal distances of P is :
- (1) $\frac{1}{\sqrt{3}} - \frac{1}{2\sqrt{11}}$
(2) $\frac{1}{\sqrt{3}} + \frac{1}{2\sqrt{5}}$
(3) $\frac{1}{\sqrt{3}} - \frac{1}{2\sqrt{5}}$
(4) $\frac{1}{\sqrt{3}} + \frac{1}{2\sqrt{7}}$

68. Let $a_1, \frac{a_2}{2}, \frac{a_3}{2^2}, \dots, \frac{a_{10}}{2^9}$ be a G.P. of common ratio $\frac{1}{\sqrt{2}}$. If $a_1 + a_2 + \dots + a_{10} = 62$, then a_1 is equal to:
- (1) $2(\sqrt{2} - 1)$ (2) $2 - \sqrt{2}$
(3) $\sqrt{2} - 1$ (4) $2(2 - \sqrt{2})$

69. Let $A = \{2, 3, 5, 7, 9\}$. Let R be the relation on A defined by xRy if and only if $2x \leq 3y$. Let l be the number of elements in R, and m be the minimum number of elements required to be added in R to make it a symmetric relation. Then $l + m$ is equal to :
- (1) 23 (2) 25
(3) 21 (4) 27

70. Let $y^2 = 12x$ be the parabola with its vertex at O. Let P be a point on the parabola and A be a point on the x-axis such that $\angle OPA = 90^\circ$. Then the locus of the centroid of such triangles OPA is:
- (1) $y^2 - 9x + 6 = 0$
(2) $y^2 - 6x + 4 = 0$
(3) $y^2 - 2x + 8 = 0$
(4) $y^2 - 4x + 8 = 0$

Integer Type Questions

71. Let $[\cdot]$ denote the greatest integer function and $f(x) = \lim_{n \rightarrow \infty} \frac{1}{n^3} \sum_{k=1}^n \left\lfloor \frac{k^2}{3^x} \right\rfloor$. Then $12 \sum_{j=1}^{\infty} f(j)$ is equal to

72. If $\int_0^1 4\cot^{-1}(1-2x+4x^2)dx = a\tan^{-1}(2) - b\log_e(5)$, where $a, b \in N$, then $(2a+b)$ is equal to _____ .

73. If P is a point on the circle $x^2 + y^2 = 4$, Q is a point on the straight line $5x + y + 2 = 0$ and $x - y + 1 = 0$ is the perpendicular bisector of PQ , then 13 times the sum of abscissa of all such points P is _____ .

74. Let the maximum value of $(\sin^{-1}x)^2 + (\cos^{-1}x)^2$ for $x \in \left[-\frac{\sqrt{3}}{2}, \frac{1}{\sqrt{2}}\right]$ be $\frac{m}{n}\pi^2$, where $\gcd(m, n) = 1$. Then $m+n$ is equal to _____ .

75. If
$$\left(\frac{1}{{}^{15}C_0} + \frac{1}{{}^{15}C_1}\right)\left(\frac{1}{{}^{15}C_1} + \frac{1}{{}^{15}C_2}\right) \cdots \left(\frac{1}{{}^{15}C_{12}} + \frac{1}{{}^{15}C_{13}}\right) = \frac{\alpha^{13}}{{}^{14}C_0 {}^{14}C_1 \cdots {}^{14}C_{12}}$$
, then 30α is equal to _____ .

