SATISH SCIENCE ACADEMY
DHANORI PUNE - 411015

JEE Paper 1
ENTRANCE EXAM - JEE MAIN

Time Allowed: 3 hours **Maximum Marks :** 300

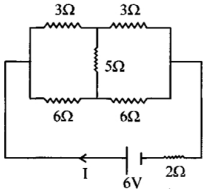
General Instructions:

- All questions are compulsory.
- There are three parts and each part carries 25 questions where the first 20 questions are MCQs and the next 5 questions are numerical.
- You will get 4 marks for each correct response and 1 mark will be deducted for an incorrect answer.

PHYSICS

1) The following observations were taken for determining surface tension T of water by the capillary method: Diameter of capillary, D = 1.25×10^{-2} m
rise of water, h = 1.45×10^{-2} m
Using g = 9.80 m/s^2 and the simplified relation
T = $\frac{rhg}{2} \times 10^3$ N/m, the possible error in surface tension is closest to: **[4]**
a) 1.5% b) 0.15%
c) 2.4% d) 10%

2) A battery of 6 V is connected to the circuit as shown below. The current I drawn from the battery is:



[4]

a) 1A
b) 2 A
c) $\frac{4}{3}$ A
d) $\frac{6}{11}$ A

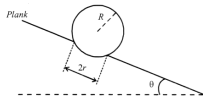
3) A projectile is given an initial velocity of$\hat{i} + 2\hat{j}$. The cartesian equation of its path is: (g = 10 m/s^2) **[4]**
a) Y = 2x - $25x^2$ b) Y = x - $5x^2$
c) 4y = 2x - $5x^2$ d) Y = 2x - $5x^2$

4) An object flying in air with velocity ($20\hat{i}$ + $25\hat{j}$ - $12\hat{k}$) suddenly breaks into two pieces whose masses are in the ratio 1:5. The smaller mass flies off with a velocity ($100\hat{i}$ + $35\hat{j}$ + $8\hat{k}$). The velocity of the larger piece will be, **[4]**

a) - $100\hat{i}$ - $35\hat{j}$ - $8\hat{k}$
b) - $20\hat{i}$ - $15\hat{j}$ - $80\hat{k}$
c) $4\hat{i}$ + $23\hat{j}$ - $16\hat{k}$
d) $20\hat{i}$ + $15\hat{j}$ - $80\hat{k}$

5) A particle of mass m moving in the x direction with speed 2v is hit by another particle of mass 2m moving in they direction with speed v. If the collision is perfectly inelastic, the percentage loss in the energy during the collision is close to: **[4]**
a) 44% b) 62%
c) 56% d) 50%

6) A football of radius R is kept on a hole of radius r(r < R) made on a plank kept horizontally. One end of the plank is now lifted so that it gets tilted making an angleθ from the horizontal as shown in the figure below. The maximum value of θ so that the football does not start rolling down the plank satisfies (the figure is schematic and not drawn to scale)



[4]

a) Cos$\theta = \frac{r}{2R}$
b) Tan$\theta = \frac{r}{R}$
c) Sin$\theta = \frac{r}{2R}$
d) Sin$\theta = \frac{r}{R}$

7) Two identical cylindrical vessels are kept on the ground and each contains the same liquid of density d. The area of the base of both vessels is S but the height of liquid in one vessel is x_1 and in the other, x_2. When both cylinders are connected through a pipe of negligible volume very close to the bottom, the liquid flows from one vessel to the other until it comes to equilibrium at a new height. The change in energy of the system in the process is: **[4]**

a) $\frac{3}{4}gdS\left(x_2 - x_1\right)^2$
b) $gdS\left(x_2 + x_1\right)^2$
c) $\frac{1}{4}gdS\left(x_2 - x_1\right)^2$
d) $gdS\left(x_2^2 + x_1^2\right)$

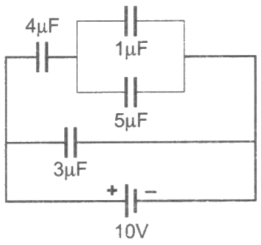
8) An external pressure p is applied on a cube at 0°C so that it is equally compressed from all sides. K is the bulk modulus of the material of the cube andα is its coefficient of linear expansion. Suppose we want to bring the cube to its original size by heating. The temperature should be raised by **[4]**
a) $\frac{p}{3\alpha K}$ b) $\frac{3\alpha}{pK}$
c) $3pK\alpha$ d) $\frac{p}{\alpha K}$

9) A monoatomic gas at pressure P and volume V is suddenly compressed to one eights of its original volume. The final pressure at constant entropy will be: **[4]**
a) P b) 32 P
c) 8 P d) 64 P

10) When two displacements represented by y_1= a sin (ω t) and y_2 = b cos(ω t) are superimposed the motion is: **[4]**

a) Simple harmonic with amplitude$\frac{a}{b}$
b) Simple harmonic with amplitude$\sqrt{a^2 + b^2}$
c) Not a simple harmonic
d) Simple harmonic with amplitude$\frac{(a\ +\ b)}{2}$

11) For the circuit shown in the figure, the charge on 4μ F capacitor is:



[4]

a) 30μ C b) 54μ C
c) 40μ C d) 24μ C

12) A galvanometer with its coil resistance 25Ω requires a current of 1mA for its full deflection. In order to construct an ammeter to read up to a current of 2 A, the approximate value of the shunt resistance should be **[4]**

a) $2.5\times 10^{-2}\ \Omega$
b) $2.5\times 10^{-2}\ \Omega$
c) $1.25\times 10^{-2}\ \Omega$
d) $1.25\times 10^{-3}\ \Omega$

13) A bar magnet has a magnetic moment of 200 Am^2. The magnet is suspended in a magnetic field of 0.30 N A^{-1} m^{-1}. The torque required to rotate the magnet from its equilibrium position through an angle of 30°, will be **[4]**

a) $60\sqrt{3}$ N m b) 60 N m
c) $30\sqrt{3}$ N m d) 30 N m

14) The induced emf can be produced in a coil by

i. Moving the coil with uniform speed inside magnetic field
ii. Moving the coil with non - uniform speed inside uniform magnetic field
iii. Rotating the coil inside the uniform magnetic field
iv. Changing the area of the coil inside the uniform magnetic field

[4]

a) B and C only b) B and D only
c) C and D only d) A and C only

15) The energy required to take a satellite to a height 'h' above earth surface (where, radius of earth = 6.4×10^3 km) is E_1 and kinetic energy required for the satellite to be in a circular orbit at this height is E_2. The value of h for which E_1 and E_2 are equal is **[4]**

a) 6.4×10^3 km b) 1.6×10^3 km
c) 1.28×10^4 km d) 3.2×10^3 km

16) A 27 mW laser beam has a cross - sectional area of 10 mm^2. The magnitude of the maximum electric field in this electromagnetic wave is given by: [Given permittivity of space $\varepsilon_0 = 9\times 10^{-12}$ SI units, Speed of light c = 3×10^8 m/s]**[4]**

a) 1.4 kV/m b) 1 kV/m
c) 0.7 kV/m d) 2 kV/m

17) Assuming the nitrogen molecule is moving with r.m.s.velocity at 400 K, the de - Broglie wavelength of nitrongen molecule is close to:
(Given: nitrogen molecule weight: 4.64×10^{-26} kg, Boltzman constant: 1.38×10^{-23} J/K, Planck constant: 6.63×10^{-34}J.s) **[4]**

a) $0.44\overset{o}{A}$ b) $0.20\overset{o}{A}$
c) $0.34\overset{o}{A}$ d) $0.24\overset{o}{A}$

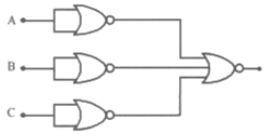
18) Taking the wavelength of first Balmer line in hydrogen spectrum (n = 3 to n = 2) as 660 nm, the wavelength of the 2nd Balmer line (n = 4 to n = 2) will be **[4]**

a) 642.7 nm b) 388.9 nm
c) 889.2 nm d) 488.9 nm

19) The ratio of the mass densities of nuclei of ^{40}Ca and ^{16}O is close to: **[4]**

a) 0.1 b) 5
c) 1 d) 2

20) Identify the operation performed by the circuit given below:



[4]

a) NAND b) NOT
c) OR d) AND

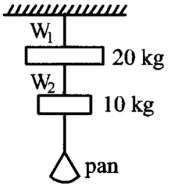
21) The distance x covered by a particle in one dimensional motion varies with time t as $x^2 = at^2 + 2bt + c$. If the acceleration of the particle depends on x as x^{-n}, where n is an integer, the value of n is _____. **[4]**

22) A series LCR circuit is connected to an ac source of 220V, 50Hz. The circuit contain a resistance R = 100Ω and an inductor of inductive reactance X_L = 79.6Ω . The capacitance of the capacitor needed to maximize the average rate at which energy is supplied will be _____ μF . **[4]**

23) A point object in air is in front of the curved surface of a plano - convex lens. The radius of curvature of the curved surface is 30 cm and the refractive index of the lens material is 1.5, then the focal length of the lens (in cm) is _____. **[4]**

24) Two parallel wires in the plane of the paper are distance X_0 apart. A point charge is moving with speed u between the wires in the same plane at a distance X_1 from one of the wires. When the wires carry current of magnitude I in the same direction, the radius of curvature of the path of the point charge is R_1. In contrast, if the currents I in the two wires have directions opposite to each other, the radius of curvature of the path is R_2. If $\frac{X_0}{X_1} = 3$, the value of $\frac{R_1}{R_2}$ is: **[4]**

25) Wires W_1 and W_2 are made of same material having the breaking stress of 1.25×10^9 N/m^2. W_1 and W_2 have cross - sectional area of 8×10^{-7} m^2 and 4×10^{-7} m^2, respectively. Masses of 20 kg and 10 kg hang from them as shown in the figure. The maximum mass that can be placed in the pan without breaking the wires is _____ kg. (Use g = 10 m/s^2)



[4]

CHEMISTRY

26) The orbital having two radial as well as two angular nodes is: **[4]**

a) 4f b) 5d
c) 3p d) 4d

27) The electronic configuration with the highest ionization enthalpy is: **[4]**

a) $[Ne]3s^23p^1$ b) $[Ar]3d^{10}4s^24p^3$
c) $[Ne]3s^23p^2$ d) $[Ne]3s^23p^3$

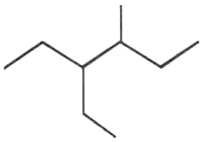
28) If K_{sp} of Ag_2CO_3 is 8×10^{-12}, the molar solubility of Ag_2CO_3 in 0.1 M $AgNO_3$ is **[4]**
a) 8×10^{-11} M b) 8×10^{-13} M
c) 8×10^{-10} M d) 8×10^{-12} M

29) The standard enthalpies of formation of $CO_2(g)$, $H_2O(l)$ and glucose(s) at 25°C are - 400 kJ/mol, - 300 kJ/mol and - 1300 kJ/mol, respectively. The standard enthalpy of combustion per gram of glucose at 25°C is **[4]**
a) +2900 kJ b) +16.11 kJ
c) - 16.11 kJ d) - 2900 kJ

30) Which amongst the following is the strongest acid? **[4]**
a) $CHCl_3$ b) $CH(CN)_3$
c) CHI_3 d) $CHBr_3$

31) Copper becomes green when exposed to moist air for a long period. This is due to: **[4]**
a) The formation of a layer of cupric hydroxide on the surface of copper
b) The formation of basic copper sulphate layer on the surface of the metal
c) The formation of a layer of cupric oxide on the surface of copper
d) The formation of a layer of basic carbonate of copper on the surface of copper

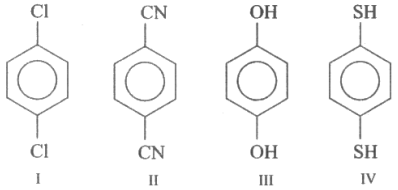
32) The correct IUPAC name of the following compound is:



[4]
a) 3, 4 - ethylmethylhexane
b) 3 - ethyl - 4 - methylhexane
c) 4 - ethyl - 3 - methylhexane
d) 4 - methyl - 3 - ethylhexane

33) In order to oxidise a mixture of one mole of each of FeC_2O_4, $Fe(C_2O_4)_3$, $FeSO_4$ and $Fe_2(SO_4)_3$ in acidic medium, the number of moles of $KMnO_4$ required is: **[4]**
a) 1 b) 1.5
c) 2 d) 3

34) For which of the following molecule significant $\mu \neq 0$?



[4]
a) I and II b) Only I
c) Only III d) III and IV

35) The freezing point of a diluted milk sample is found to be - 0.2° C, while it should have been - 0.5°C for pure milk. How much water has been added to pure milk to make the diluted sample? **[4]**
a) 1 cup of water to 2 cups of pure milk
b) 2 cups of water to 3 cups of pure milk
c) 3 cups of water to 2 cups of pure milk
d) 1 cup of water to 3 cups of pure milk

36) Evaluate the following statements for their correctness.
i. The elevation in boiling point temperature of water will be same for 0.1 M NaCl and 0.1 M urea.
ii. Azeotropic mixtures boil without change in their composition.
iii. Osmosis always takes place from hypertonic to hypotonic solution.
iv. The density of 32% H_2SO_4 solution having molarity 4.09 M is approximately $1.26 gmL^{-1}$.
v. A negatively charged sol is obtained when Kl solution is added to silver nitrate solution.
[4]
a) A, B, and D only b) A and C only
c) B and D only d) B, D, and E only

37) The decreasing order of electrical conductivity of the following aqueous solutions is:
i. 0.1 M Formic acid
ii. 0.1 M Acetic acid
iii. 0.1 M Benzoic acid
[4]
a) A > B > C b) C > B > A
c) C > A > B d) A > C > B

38) NO_2 required for a reaction is produced by the decomposition of N_2O_5 in CCl_4 as per the equation,
$2N_2O_5(g) \rightarrow 4NO_2(g) + O_2(g)$
The initial concentration of N_2O_5 is 3.00 mol L^{-1} and it is 2.75 mol L^{-1} after 30 minutes. The rate of formation of NO_2 is **[4]**
a) 2.083×10^{-3} mol L^{-1} min^{-1}
b) 1.667×10^{-2} mol L^{-1} min^{-1}
c) 4.167×10^{-3} mol L^{-1} min^{-1}
d) 8.333×10^{-3} mol L^{-1} min^{-1}

39) The standard electrode potentials $\left(E^{\circ}_{M^+/M}\right)$ of four metals A, B, C and D are - 1.2 V, 0.6 V, 0.85 V and - 0.76 V, respectively. The sequence of deposition of metals on applying potential is: **[4]**
a) D, A, B, C b) A, C, B, D
c) B, D, C, A d) C, B, D, A

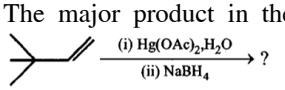
40) Aqueous solution of which salt will not contain ions with the electronic configuration $1s^2 2s^2 2p^6 3s^2 3p^6$? **[4]**
a) NaF b) KBr
c) NaCl d) CaI_2

41) Consider that a d^6 metal ion (M^{2+}) forms a complex with aqua ligands, and the spin - only magnetic moment of the complex is 4.90 BM. The geometry and the crystal field stabilization energy of the complex is: **[4]**
a) Tetrahedral and $-0.6\Delta_t$
b) Tetrahedral and $-1.6\Delta_t + 1P$
c) Octahedral and $-1.6\Delta_0$
d) Octahedral and $-2.4\Delta_0 + 2P$

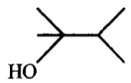
42) The major product of the following reaction is:

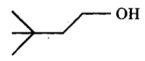
[4]
a) $CH_3CH=C=CHCH_2CH_3$ b) $CH_2=CHCH=CHCH_2CH_3$
c) $CH_2=CHCH_2CH=CHCH_3$ d) $CH_3CH=CH-CH=CHCH_3$

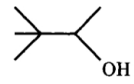
43) The major product in the following reaction

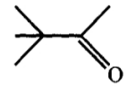


[4]
a)

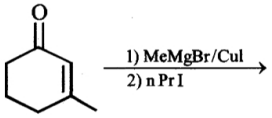


b) 

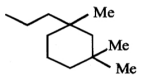
c) 

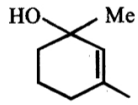
d) 

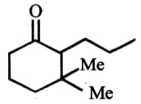
44) Find out the major product from the following reaction

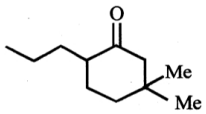


[4]

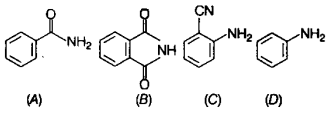
a) 

b) 

c) 

d) 

45) The increasing order of reactivity of the following compounds towards reaction with alkyl halides directly is



[4]

a) (B) < (A) < (C) < (D)
b) (B) < (A) < (D) < (C)
c) (A) < (B) < (C) < (D)
d) (A) < (C) < (D) < (B)

46) Assume that the radius of the first Bohr orbit of hydrogen atom is $0.6\overset{o}{A}$. The radius of the third Bohr orbit of He^+ is picometer. (Nearest Integer) **[4]**

47) A first order reaction has the rate constant, $k = 4.6 \times 10^{-3}\ s^{-1}$. The number of correct statement/s from the following is/are _____. Given: log 3 = 0.48

i. Reaction completes in 1000 s.
ii. The reaction has a half - life of 500 s.
iii. The time required for 10% completion is 25 times the time required for 90% completion.
iv. The degree of dissociation is equal to $(1 - e^{-kt})$.
v. The rate and the rate constant have the same unit.

[4]

48) The total number of unpaired electrons present in the complex $K_3[Cr(oxalate)_3]$is _____. **[4]**

49) A metal surface of 100 cm^2 area has to be coated with nickel layer of thickness 0.001 mm. A current of 2A was passed through a solution of $Ni(NO_3)_2$ for **x** seconds to coat the desired layer. The value of x is _____ (Nearest integer)
(ρ_{Ni} (density of Nickel) is 10 gmL^{-1}, Molar mass of Nickel is 60 $gmol^{-1}$ F = 96500 C mol^{-1}) **[4]**

50) Among H_2, He_2^+ , Li_2, Be_2, B_2, C_2, N_2, O_2^- and F_2, the number of diamagnetic species is
(Atomic numbers: H = 1, He = 2, Li = 3, Be = 4, B = 5, C = 6, N = 7, O = 8, F = 9) **[4]**

MATHEMATICS

51) Let P be the relation defined on the set of all real numbers such that
P = (a, b): $\sec^2 a - \tan^2 b = 1$. Then P is: **[4]**

a) Symmetric and transitive but not reflexive
b) An equivalence relation
c) Reflexive and symmetric but not transitive
d) Reflexive and transitive but not symmetric

52) Letω be a complex number such that $2\omega + 1 = z$ where $z = \sqrt{-3}$. If $\begin{vmatrix} 1 & 1 & 1 \\ 1 & -\omega^2 - 1 & \omega^2 \\ 1 & \omega^2 & \omega^7 \end{vmatrix} = 3k$, then k is equal to **[4]**

a) 1 b) - z
c) - 1 d) Z

53) All the letters of the word PUBLIC are written in all possible orders and these words are written as in a dictionary with serial numbers. Then the serial number of the word PUBLIC is **[4]**

a) 578 b) 580
c) 576 d) 582

54) The value of $\frac{1}{1!50!} + \frac{1}{3!48!} + \frac{1}{5!46!} + ... + \frac{1}{49!2!} + \frac{1}{51!1!}$ is: **[4]**

a) $\frac{2^{51}}{50!}$ b) $\frac{2^{50}}{50!}$
c) $\frac{2^{51}}{51!}$ d) $\frac{2^{50}}{51!}$

55) The coefficient of x^{301} in $(1 + x)^{500} + x(1 + x)^{499} + x^2(1 + x)^{498} + ... + x^{500}$ is: **[4]**

a) ${}^{501}C_{302}$ b) ${}^{500}C_{301}$
c) ${}^{501}C_{200}$ d) ${}^{500}C_{300}$

56) Let$\frac{dy}{dx} = \frac{ax-by+a}{bx+cy+a}$, where a, b, c are constants represent a circle passing through the point (2, 5). Then the shortest distance of the point (11, 6) from this circle is: **[4]**

a) 7 b) 10
c) 5 d) 8

57) Let the function $f(x) = 2x^3 + (2p - 7)x^2 + 3(2p - 9)x - 6$ have a maxima for some value of $x < 0$ and a minima for some value of $x > 0$. Then, the set of all values of p is **[4]**

a) $\left(-\frac{9}{2}, \frac{9}{2}\right)$
b) $\left(-\infty, \frac{9}{2}\right)$
c) $\left(\frac{9}{2}, \infty\right)$
d) $\left(0, \frac{9}{2}\right)$

58) The integral$\int_2^4 \frac{\log x^2}{\log x_2 + \log(36 - 12x + x_2)} dx$ is equal to **[4]**

a) 4 b) 2
c) 6 d) 1

59) The sides of a rhombus ABCD are parallel to the lines, x - y + 2 = 0 and 7x - y + 3 = 0. If the diagonals of the rhombus intersect at P(1, 2) and the vertex A (different from the origin) is on the y - axis, then the ordinate of A is: **[4]**

a) 2 b) $\frac{5}{2}$
c) $\frac{7}{4}$ d) $\frac{7}{2}$

60) If the tangent at (1, 7) to the curve $x^2 = y - 6$ touches the circle $x^2 + y^2 + 16x + 12y + c = 0$, then the value of c is **[4]**

a) 185 b) 95
c) 195 d) 85

61) The equation of a tangent to the parabola, $x^2 = 8y$, which makes an angle θ with the positive direction of X - axis,

is **[4]**

a) X = y cotθ + 2 tan θ
b) X = y cotθ - 2 tan θ
c) Y = x tanθ - 2 cot θ
d) Y = x tanθ + 2 cot θ

62) If$\frac{dy}{dx} + 2ytanx = sinx, 0 < x <$ **[4]**
a) $\frac{3}{8}$ b) $\frac{1}{8}$
c) $\frac{3}{4}$ d) $\frac{1}{4}$

63) Let$\sqrt{3}\hat{i}+\hat{j}, \hat{i}+\sqrt{3}\hat{j}$ and $\beta\hat{i}+(1-\beta)\hat{j}$ respectively be the position vectors of the points A, B and C with respect the origin O. If the distance of C from the bisectors of the acute angle between OA and OB is $\frac{3}{\sqrt{2}}$, then the sum of all possible values of β is **[4]**
a) 3 b) 4
c) 2 d) 1

64) The sum of all values ofα , for which the points whose position vectors $\hat{i}-2\hat{j}+3\hat{k}, 2\hat{i}-3\hat{j}+4\hat{k}, \quad (\alpha+1)\hat{i}+2\hat{k}$ and $9\hat{i}+(\alpha-8)\hat{j}+6\hat{k}$ are coplanar, is equal to **[4]**
a) 4 b) 6
c) - 2 d) 2

65) If the mean of the data: 7, 8, 9, 7, 8, 7,λ , 8 is 8, then the variance of this data is: **[4]**
a) 2 b) 1
c) $\frac{7}{8}$ d) $\frac{9}{8}$

66) Let N denote the number that turns up when a fair die is rolled. If the probability that the system of equations
x + y + z = 1
2x + Ny + 2z = 2
3x + 3y + Nz = 3
has unique solution is $\frac{k}{6}$ then the sum of value of k and all possible values of N is **[4]**
a) 18 b) 20
c) 21 d) 19

67) ABC is a triangular park with AB = AC = 100 m. A vertical tower is situated at the mid - point of BC. If the angles of elevation of the top of the tower at A and B are$\cot^{-1}(3\sqrt{2})$ and $cosec^{-1}(2\sqrt{2})$ respectively, then the height of the tower (in m) is **[4]**
a) 25
b) $10\sqrt{5}$
c) $\frac{100}{3\sqrt{3}}$
d) 20

68) If 5x + 9 = 0 is the directrix of the hyperbola $16x^2$ - $9y^2$= 144, then its corresponding focus is **[4]**
a) $\left(\frac{5}{3}, 0\right)$
b) $\left(-\frac{5}{3}, 0\right)$
c) (5, 0)
d) (- 5, 0)

69) Let A, B and C be sets such that$\phi \neq A \cap B \subseteq C$. Then which of the following statements is not true? **[4]**
a) $B \cap C \neq \phi$
b) If (A - C)$\subseteq$ B, then A $\subseteq$ B
c) $(C \cup A) \cap (C \cup B)$ = C
d) If (A - B)$\subseteq$ C, then A $\subseteq$ C

70) If S $= x \in [0, 2\pi] : \begin{vmatrix} 0 & \cos x & -\sin x \\ \sin x & 0 & \cos x \\ \cos x & \sin x & 0 \end{vmatrix} = 0$
then $\sum_{x \in S}$ tan $\left(\frac{\pi}{3}+x\right)$ is equal to **[4]**
a) - 2 - $\sqrt{3}$ b) - 2 +$\sqrt{3}$
c) - 4 - $2\sqrt{3}$ d) 4 +$2\sqrt{3}$

71) If$\vec{a}$ = $2\hat{i}$ + $\hat{j}$ + $2\hat{k}$, then the value of $|\hat{i} \times (\vec{a} \times \hat{i})|^2 + |\hat{j} \times (\vec{a} \times \hat{j})|^2 + |\hat{k} \times (\vec{a} \times \hat{k})|^2$ is equal to _____. **[4]**

72) Letα be the area of the larger region bounded by the curve y^2 = 8x and the lines y = x and x =2, which lies in the first quadrant. Then the value of 3 a is equal to _____. **[4]**

73) Let A = $\begin{bmatrix} x & 1 \\ 1 & 0 \end{bmatrix}$, x $\in$ R and A^4 = [a_{ij}]. If a_{11} = 109, then a_{22} is equal to _____. **[4]**

74) Let a_1, a_2,..., a_n be in A.P. If a_5 = $2a_7$ and a_{11} = 18, then $12\left(\frac{1}{\sqrt{a_{10}}+\sqrt{a_{11}}} + \frac{1}{\sqrt{a_{11}}+\sqrt{a_{12}}} + \ldots . \frac{1}{\sqrt{a_{17}}+\sqrt{a_{18}}}\right)$ is equal to _____. **[4]**

75) The total number of four digit numbers such that each of the first three digits is divisible by the last digit, is equal to _____. **[4]**