

NEW STANDARD ACADEMY

Date : 22-07-24

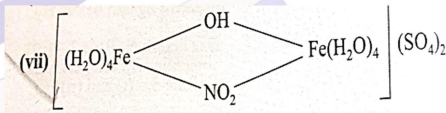
CLASS : 12TH JEE

Marks: 60
Time: 3 HRS

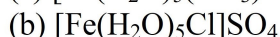
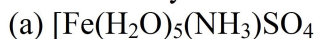
PHYSICS

- An alternating current is given by following equation: $i = 3\sqrt{2} \sin(100\pi t + \pi/4)$. Give the frequency and mean value of the current
- A voltage $E = 60 \sin 314 t$ is applied across a resistor, What will of I_{rms} (i) in a c. ammeter. (ii) ordinary moving coil ammeter in series with the resistor read?
- A pure inductance of 1.0 H is connected across a 110 V, 70 Hz source. Find reactance, current and peak value of current.
- A group of electric lamps having total power rating of 900 watt is supplied an a.c. voltage $E = 200 \cos(314t + 60^\circ)$. Find rms value of ac current.
- A circuit containing a 80 mH inductor and a 60 μ F capacitor in series is connected to a 230 V, 50 Hz supply The resistance of the circuit is negligible.
(a) Obtain the current amplitude and rms value.
- A circuit containing a 80 mH inductor and a 60 μ F capacitor in series is connected to a 230 V, 50 Hz supply Suppose the circuit has a resistance of 15 Ω . Obtain the average power transferred to each element of the circuit and the total power absorbed.
- A 100 μ F capacitor in series with a 40 Ω resistance is connected to a 110 V, 60 Hz supply.
(a) What is the maximum current in the circuit?
(b) What is the time lag between the current maximum and voltage maximum.
- A coil of inductance 0.50 H and resistance 100 Ω is connected to a 240 V, 50 Hz ac supply.
(a) What is the maximum current in the coil?
(b) What is the time lag between the voltage maximum and current maximum?
- A alternating voltage $E = 200 \sin 300t$ is applied across a series combination of resistance of 10 Ω and an inductor of 800 mH. Calculate
(i) impedance of the circuit,
(ii) peak value of current in the circuit and
(iii) power factor of the circuit
- In LR series circuit, a sinusoidal $V = V_0 \sin \omega t$ is applied. It is given that $L = 35$ mH, $R = 11 \Omega$. $V_{rms} = 220V$ $\frac{\omega}{2\pi} = 50$ Hz and $\pi = 22/7$. Find the amplitude of current in steady state and obtain the phase difference between the current and the voltage. Also plot variation of current for one cycle on the given graph.

CHEMISTRY

- What are the effective atomic numbers of the metal atoms in:
a) $Fe(CO)_5$ b) $Co_2(CO)_8$
c) $Fe(C_5H_5)_2$ d) $K_3 [Fe(CN)_6]$
 - In which of following case EAN rule is not satisfied?
a) $[Fe(n^5C_5H_5)_2]$
b) $(Ni(DMG)_2)$
c) $K_2[Fe(CN)_6]$
d) $[CoF_6]^{3-}$
 - Predict value of x For $H_x Cr(CO)_5$ and $CO_2(CO)_x$
 - Write the IUPAC name for the following
a) $[Cr(NH_3)_4 Cl_2]^+$ b) $[Pt(NH_3)_2 Cl_2]Cl_2$.
- (vii) 
- $[Co(en)_2(CN)_2]ClO_3$
- The correct IUPAC name of
(a) $KAl(SO_4)_2 \cdot 12H_2O$ is
(b) $[Cr(NH_3)_6]^{3+}$ is
 - The IUPAC name for the compound $K[SbCl_5 Ph]$ is.
 - Octahedral complex which shows both

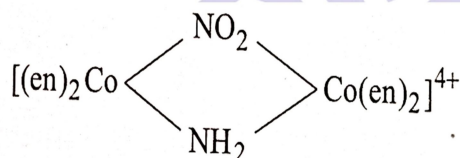
ionization hydrate isomerism:



8. Platinum (II) forms square planar complexes and platinum (IV) gives octahedral complexes. How many geometrical isomers are possible for each of the following complexes? Describe their structures



9. Draw all the optical isomers for



10. Which of the following exhibit geometrical isomerism? (M stands for a metal, and a and b are achiral ligands).



MATHS

- Find the slope of the tangent to the curve $y = \frac{x-1}{x-2}$, $x \neq 2$ at $x=10$.
- Find the slope of the normal to the curve $x = 1 - a \sin \theta$, $y = b \cos^2 \theta$ at $\theta = \pi/2$
- Find the points of contact of the vertical tangents to $x = 2 - 3 \sin \theta$, $y = 3 + 2 \cos \theta$.
- An edge of a variable cube is increasing at the rate of 3 cm/s. How fast is the volume of the cube increasing when the edge is 10 cm long?
- If the function $f(x) = 2x^2 + 3x + 5$ satisfies LMVT at $x = 2$ on the closed interval $[1, a]$ then find the value of 'a'.
- If the volume of a spherical balloon is increasing at the rate of 900 cm^3 per sec, then the rate of change of radius of balloon at instant when radius is 15 cm.
- The equation of tangent to the curve $y = 2 \cos x$ at $x = \frac{\pi}{4}$ is
- If a tangent to the curve $y = 6x - x^2$ is parallel to the line $4x - 2y - 1 = 0$, then the point of tangency on the curve is
- The angle of intersection of the curves $y = x^2$ and $x = y^2$ at $(1, 1)$ is.
- For the function $f(x) = e^x$, $a = 0$, $b = 1$, the value of c in mean value theorem will be