JEE Main 10 April 2019 Questions and Answers (Shift 1 and Shift 2)

Chemistry

Q 1: Name the alloy which is used in making aircraft?
Ans: Al-Mg

Q 2: What is the Electrophilic aromatic substitution reactivity order?

Q 3: What is the reactivity order of SN1 reactions?

Q 4: Pair of Isoelectronic compounds is: a) Li+, Na+, F-, O2- b) Li+, Na3-, F-, O2- c) Li+, F-, N3-, Na+ d) N3-, O2-, F-, Na+
Ans: N3-, O2-, F-, Na+

Q 5: Correct order of Catenation tendency is? a) C>Si>Ge≈ b) C>Ge≈Si>Sn c) C>Si≈Gn>Sn d) Sn>Ge>Si>C
Ans: C>Si>Ge≈

Q 6: What should be ΔH & ΔS for process to be spontaneous reaction at all atmosphere a) ΔH>0; ΔS>0 b) ΔH0 c) Δ0, Δ
Ans: ΔH0

Q 7: If 1/n part of chain is hanging then the work done to pull up the whole chain

Q 8: Which is a condensation polymer?
Ans: Nylon 6,6

Q 9: Which of the noble gas cannot exist in the atmosphere?
(1) He
(2) Ne
(3) Kr
(4) Rn
Ans: Rn

Qs.10: The highest possible oxidation states of Uranium and Plutonium are ?
a)4&6
b)6&7
c)7&6

d)6&4

Q 11: Air Pollution that occurs in sunlight is ?
a) reducing smog
b) acid rain
c)oxidizing smog
d) fog
Ans: Oxidizing Smog

Q 12: what is the other name for water gas

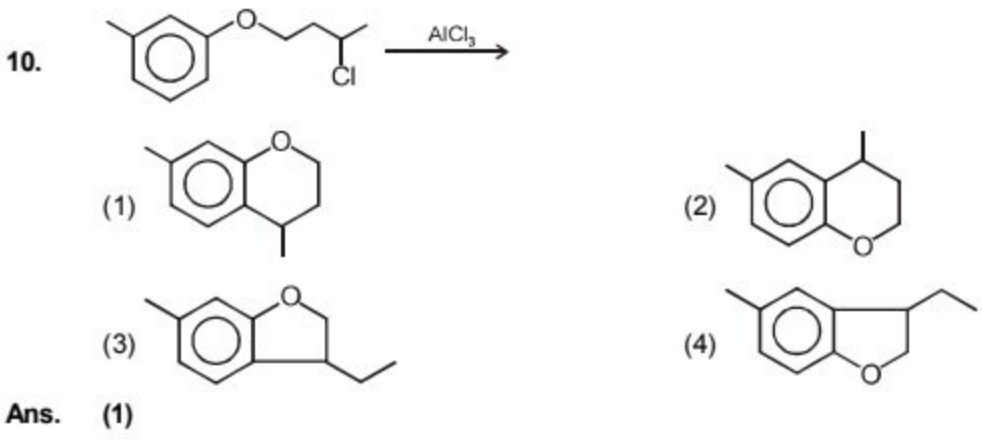
Q 13: Maximum oxidation state of U and Pu is (a) +6, +7 (b) +6, +4 (c) +7, +6 (d) +2, +5
Ans: +6, +7

Q 14: Compound X on heating gives monohydrate Y which on heating at 373 K gives anhydrous residue. Compound X and Z are (a) Washing soda and Soda ash (b) Soda ash and Dry ash (c) Baking soda and Soda ash (d) Dry ash and Washing soda
Ans: Washing soda and Soda ash

Q 15: In buckminsterfullerene number of pentagonal ring. Number of triangles in P4 are (a) 12 : 4 (b) 20 : 4 (c) 12 : 6 (d) 20 : 20
Ans: 12 : 4

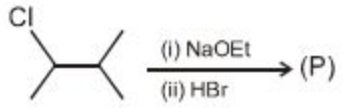
Qs.16: The order of increasing Ionisation energy among Ti, Zn, Ni, Mn is (a) Zn
Ans: Ti

Q 17:

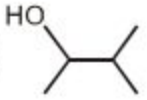


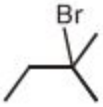
Ans: Correction is (1)

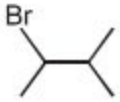
Qs.18:

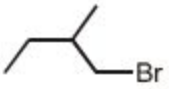
13. 

Identify the product (P)

(1) 

(2) 

(3) 

(4) 

Ans: Correct option is (2)

Q 19: Number of stereocenters present in cyclic and linear structure of glucose are respectively (a) 4, 5 (b) 5, 4 (c) 4, 4 (d) 5, 5
Ans: 4, 5

Q 20: For Retention factor (Rf) value, incorrect is (1) Rf depend on mobile phase (2) Does not depend on different type of chromatography (3) Rf increase, adsorption increase (4) Rf
Ans: Does not depend on different type of chromatography

Physics

Q 1: What is the principle of Chromatography?

Q 2: Light of wavelength 260 nm falls on a metal plate whose threshold wavelength is 380 nm. Find the maximum kinetic energy of ejected electrons
Ans: 1.5 eV

Q 3: Decay constants of two nuclei A and B are 10λ and λ respectively. Initially, the number of nuclei of A and B are same. Find the time at which ratio of nuclei of A and B is 1/E
Ans: 1/9λ

Q 4: An ideal step down transformer turns in has 300 turns in primary coil and 150 turns in secondary coil. If the output power is 2.2 kW and current in primary coil is 10A. Then find the input voltage and current in secondary coil.
Ans: 110 V and 20 A

Q 5: A particle with mass 2 kg collide with a another mass m elastically. And it moves in the same direction after collision with (1/4)th of its initial velocity, what will be the mass of other body

Ans: 1.2 kg

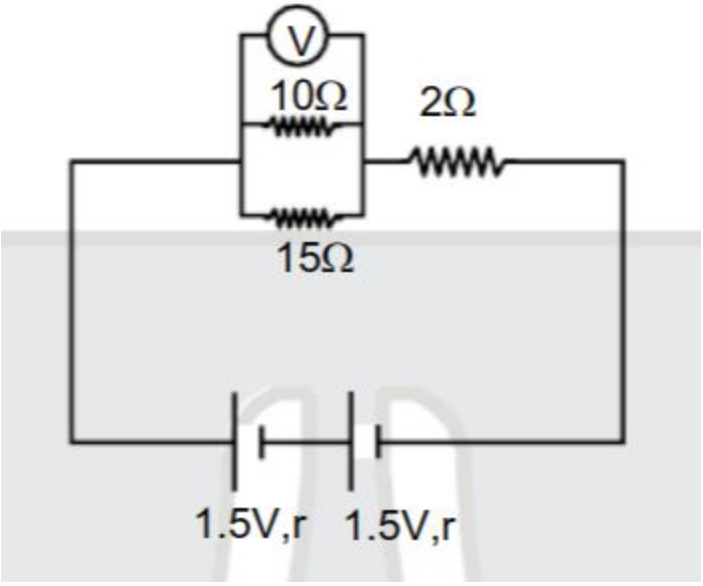
Q 6: If the wavelength of a hydrogen spectrum in Balmer series from n = 3 to n = 2 is 660 nm. Find the wavelength if it makes a transition from n = 4 to n = 2
Ans: $\lambda 1/\lambda 2=27/20$

Q 7: Two disc of moment of inertia I and I/2 about their respective axes (normal to the disc and passing through the center), and rotating with angular speed ω and ω/2 are brought together into contact with their axis of rotation coincident. After some time both the disc starts to rotate with a common velocity
Ans: $5\omega/6$

Q 8: The surface mass density of a disc is given by $\sigma = kr^2$, where K is positive constant and 'r' is the distance from the center of the disc. What will be the moment of inertia of this disc? (The radius of disc is R and its total mass is M)
Ans: $2/3\ MR^2$

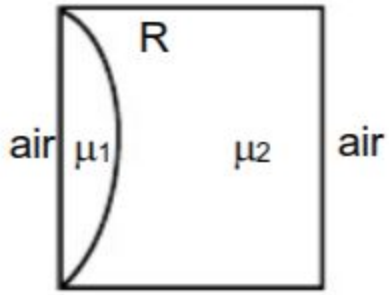
Q 9: Mass of a bullet was given it ht he box which was hung, Find the speed of the bullet?

Q 10: If the reading of the ideal voltmeter shown in the circuit is 2V the internal resistance of the two identical cells is



Ans: 1/2 Ω

Q 11: Find out equivalent focal length of given lens combination



Mathematics

Q 1: There were two points given on the graph P and Q on the intersection of two circles. Find the value of K

Q 2: Range of x is given between (0,π), (0,π/2). Find the integral value of x in the given equation

Q 3: The area bounded by curve $|x+y| \leq 2$ and $|x-2| \leq 2$ is
Ans: 16

Q 4: The slope and area of region bounded by the curve $|x=y| \leq 2$ and $|x-y| \leq 2$ are
Ans: Square, 8 units

Q 5: Let y=y(x) be a solution of differential equation $dy/dx = (\tan x - y)\sec^2 x$. If $y(0) = 0$, then $y(-11/4)$ equals to
Ans: e-2

Q 6: A line y=x touches a circle at point (1,1) which also passes through (1,-3). The radius of the circle is
Ans: $2\sqrt{2}$

Q 7:

1. If $\int \frac{dx}{x^3(1+x^6)^{2/3}} = x.f(x) \cdot (1+x^6)^{1/3} + C$, then f(x) is equal to

(1*) $\frac{-1}{2x^3}$ (2) $\frac{-1}{2x^2}$ (3) $\frac{-1}{6x^2}$ (4) $\frac{1}{6x^2}$

Ans: $-1/2x^3$

Q 8:

5. $f'(3) + f'(2) = 0$ Find the $\lim_{x\to 0}\left(\frac{1+f(3+x)-f(3)}{1+f(2-x)-f(2)}\right)^{\frac{1}{x}}$

(1) e^{π} (2) e^2 (3*) 1 (4) $e^{1/2}$

Ans. **(3)**

Sol. $\lim_{x\to 0}\left(\frac{1+f(3+x)-f(3)}{1+f(2-x)-f(2)}\right)^{\frac{1}{x}} \Rightarrow e^{\lim_{x\to 0}\left(\frac{1+f(3+x)-f(3)-1-f(2-x)+f(2)}{x(1+f(2-x)-f(2))}\right)}$

$e^{\lim_{x\to 0}\frac{f(3+x)-f(2-x)-(f(3)-f(2))}{x(1+f(2-x)-f(2))}} \Rightarrow e^{\lim_{x\to 0}\frac{f'(3+x)+f'(2-x)}{1}}$

$e^{f'(3)+f'(2)} = e^0 = 1$

Q 9:

$\sum_{k=1}^{20} k\frac{1}{2^k}$ is equal to

(1*) $2-\frac{11}{2^{19}}$ (2) $1-\frac{11}{2^{20}}$ (3) $2+\frac{11}{2^{19}}$ (4) $1+\frac{11}{2^{20}}$

Ans: Option 1 is correct

Q 10: The locus of center of circle which touches the circle $x^2+y^2 = 1$ and y-axis in 1st quadrant is a) $y^2=2x-1$ b) $x^2+1=2y$ c) $y^2=2x+1$ d) $x^2-1=2y$

Ans: $y^2=2x+1$

Q 11: There are 20 pillars of equal height on a circular ground any two non-adjacent pillars are joined by a beam. Then the number of such beams are

Ans: 20C2-20

Q 12: If one of the directrix of hyberbola $x^2/9 - y^2/16 = 1$ is x = 9/5. Thent he corresponding focus of hyperbola is a) (5,0) b) (-5,0) c) (0,4) d) (0,-4)

Ans: (-5,0)

Q 13: Let z and w be two complex numbers such that |zw| = 1 and arg(z) - arg(w) = π/2, then

Ans: $z\bar{\omega} = 1$

Q 14: A straight line parallel to the straight line 4x-3y+2=0 is at a distance of 3/5 units from the origin. Then which of the following points lie on this line a) (1/4, 2/3) b) (-1/4, 2/3) c) (1/4, -1/3) d) (-1/4, -2/3)

Ans: (-1/4, 2/3)

Q 15:

Value of $\int_{\pi/6}^{\pi/3} \sec^{2/3} x \cdot \operatorname{cosec}^{4/3} x \, dx$ is

(1) $2^{\frac{7}{6}} - 2^{\frac{5}{6}}$ (2) $2^{\frac{5}{6}} - 2^{\frac{3}{4}}$ (3) $3^{\frac{5}{6}} - 3^{\frac{3}{4}}$ (4*) $3^{\frac{7}{6}} - 3^{\frac{5}{6}}$

Ans: Correct option is D

Q 16:

If $\lim_{x \to 1} \frac{x^2 - ax + b}{x - 1} = 5$, then the value of a + b is

a) 1 b) -5 c) 3 d) 4

Ans: 4

Q 17: A coin is tossed n times. If the probability of getting at least one head is atleast 99%, then the minimum value of n is a) 6 b) 7 c) 8 d) 9

Ans: 7

Q 18:

The solution of differential equation $\frac{dy}{dx} + y \tan x = 2x + x^2 \tan x$ is

(1) $y = x^2 + c \cos x$ (2) $y = 2x^2 - c \cos x$

(3) $y + x^2 = c \cos x$ (4) $y + 2x^2 = c \cos x$

Ans: Correct option is A

Q 19: Area of triangle formed by tangent and normal to ellipse $3x^2 + 5y^2 = 32$ at point (2,2) and x-axis is

Ans: 68, 15

Q 20: If the foot of the perpendicular drawn from a point on the line x-1/2 = y+1/-1 =z/1 on the plane x + y +z = 3 also lies on the plane x-y+z=3, then the coordinates of the foot of perpendicular is a) (-2,0,5) b) (-1,0,4) c) (1,0,2) d) (2,0,1)

Ans: (2,0,1)

Q 21: If three parallel planes are given by P1: 2x-y+2z=6 P2: 4x-2y+4z= λ P3: 2x-y+2x = μ If the distance between P1 and P2 is 1/3 and between P1 and P2 is 2/3, then the maximum value is a) 22 b) 20 c) 18 d) 24

Ans: 22

Q 22: If a,b,c are in GP and 3a,7b,15c are first 3 term of AP. Also the common ratio of GP ∈ (0, 1/2). Then the 4th term of AP is
Ans: a

Q 23: In a ΔABC, c=4 and anglases A, B, and C are in AP. Also ration a:b is 1:√3. Then area of ΔABC is a) 1:√3 b) 21:√3 c) 31:√3 d) 41:√3
Ans: 21:√3