JEE-Main-02-04-2025 (Memory Based)

[EVENING SHIFT]

Chemistry

Question: Correct order of electronegativity in below elements
(a) $1s^2\ 2s^2\ 2p^3$ **(b) $1s^2 2s^2 2p^4$**
(c) $1s^2 2s^2 2p^5$ **(d) $1s^2 2s^2 2p^5$**
Options:
(a) a > b > c > d
(b) c > b > a > d
(c) d > c > b > a
(d) c > b > d > a
Answer: (b)

Question: Nature of compounds TeO_2 and TeH_2 is____ and ___ respectively
Options:
(a) Oxidising and Reducing respectively
(b) Highly acidic and highly basic respectively
(c) Reducing and Basic respectively
(d) Basic and oxidising
Answer: (a)

Question: In 3, 3-dimethylhex-1-en-4-yne, the number of sp, sp^2 and sp^3 carbon atoms, respectively are
Options:
(a) 2, 2, 4
(b) 2, 2, 2
(c) 1, 2, 2
(d) 2, 4, 2
Answer: (a)

Question: Statement-I: Melting point of neopentane is greater than that of n-pentane.
Statement-II: Neopentane give only one mono-substituted product
Options:
(a) Both S-I and S-II are correct
(b) Both S-I and S-II are incorrect
(c) S-I is incorrect but S-II is correct
(d) S-I is correct but S-II is incorrect
Answer: (a)

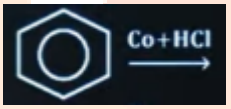
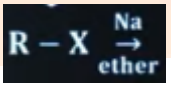
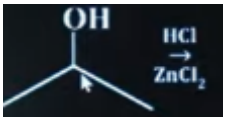
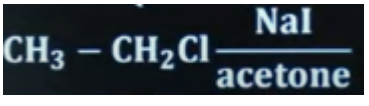
Question: Sodium nitroprusside test is used for detection of which of the following species in organic compounds
Options:
(a) SO_4^{2-}
(b) S^{2-}

(c) Na^+
(d) PO_4^{3-}
Answer: (b)

Question: Which of the following is the correct order of enthalpy of atomisation of 3d-series?
Options:
(a) NI > Cu > Mn > Zn
(b) Zn > Cu > Mn > Ni
(c) Cu > Mn > Ni > Zn
(d) Mn > Ni > Cu > Zn
Answer: (a)

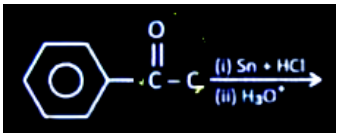
Element		Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn
Atomic number		21	22	23	24	25	26	27	28	29	30
Electronic configuration											
	M	$3d^14s^2$	$3d^24s^2$	$3d^34s^2$	$3d^54s^1$	$3d^54s^2$	$3d^64s^2$	$3d^74s^2$	$3d^84s^2$	$3d^{10}4s^1$	$3d^{10}4s^2$
	M^+	$3d^14s^1$	$3d^24s^1$	$3d^34s^1$	$3d^5$	$3d^54s^1$	$3d^64s^1$	$3d^74s^1$	$3d^84s^1$	$3d^{10}$	$3d^{10}4s^1$
	M^{2+}	$3d^1$	$3d^2$	$3d^3$	$3d^4$	$3d^5$	$3d^6$	$3d^7$	$3d^8$	$3d^9$	$3d^{10}$
	M^{3+}	[Ar]	$3d^1$	$3d^2$	$3d^3$	$3d^4$	$3d^5$	$3d^6$	$3d^7$	–	–
Enthalpy of atomisation, $\Delta_a H^\circ$/kJ mol^{-1}		326	473	515	397	281	416	425	430	339	126
Ionisation enthalpy/$\Delta_i H^\circ$/kJ mol^{-1}											
$\Delta_i H^\circ$	I	631	656	650	653	717	762	758	736	745	906
$\Delta_i H^\circ$	II	1235	1309	1414	1592	1509	1561	1644	1752	1958	1734
$\Delta_i H^\circ$	III	2393	2657	2833	2990	3260	2962	3243	3402	3556	3837
Metallic/ionic	M	164	147	135	129	137	126	125	125	128	137
radii/pm	M^{2+}	–	–	79	82	82	77	74	70	73	75
	M^{3+}	73	67	64	62	65	65	61	60	–	–
Standard electrode potential E°/V	M^{2+}/M	–	−1.63	−1.18	−0.90	−1.18	−0.44	−0.28	−0.25	+0.34	-0.76
	M^{3+}/M^{2+}	–	−0.37	−0.26	−0.41	+1.57	+0.77	+1.97	–	–	–
Density/g cm^{-3}		3.43	4.1	6.07	7.19	7.21	7.8	8.7	8.9	8.9	7.1

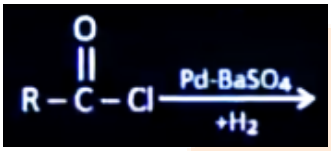
Question: Match the column

Column-I	Column-II
(P) Finkelstein Reaction	**(I)** 
(Q) Lucas Reaction	**(II)** 
(R) Wurtz Reaction	**(III)** 
(S) Gattermannkoach reaction	**(IV)** 

Options:
(a) P-IV, Q-III, R-II, S-I
(b) P-I, Q-II, R-III, S-IV

(c) P-II, Q-III, R-I, S-IV
(d) P-I, Q-II, R-I, S-IV
Answer: (a)

Question: Which of the following reactions given carboxylic acid
Options:
(a) $RCN \rightarrow^{H^+/H_2O}$
(b) $RCH_2OH \rightarrow^{PCC}$
(c) 

(d) 

Answer: (a)

Question: In adiabatic process, the magnitude of work done in case of one step & ∞ step follows order:
Options:
(a) $|W_{rev}|_{expansion} > |W_{irr}|_{expansion}$
(b) $|W_{rev}|_{expansion} < |W_{irrev}|_{expansion}$
(c) $|W_{rev}|_{expansion} = |W_{irrev}|_{expansion}$
(d) Can't be predicted
Answer: (a)

Question: The four different amino acids are given, A, B, C and D. Calculate the number of tetrapeptides formed including all the four amino acids
Options:
(a) 8
(b) 16
(c) 24
(d) 32
Answer: (c)

Question: Match the column

Column-I	**Column-II**
(P) fractional Distillation	**(I) diesel. + petrol**
(Q) Simple Distillation	**(II) aniline + H_2O**
(R) under. Reduce,P Distillation	**(III) aniline + $CHCl_3$**
(S) Steam Distillation	**(IV) Glycerol pentyl**

Options:
(a) P-I; Q-III; R-IV; S-II
(b) P-II; Q-II; R-III; S-II
(c) P-III; Q-II; R-IV; S-I
(d) P-I; Q-II; R-III; S-IV
Answer: (a)

Question: Among the following molecules which one has sp^3d hybridization having lone pair and having different bond length:
XeF_2, XeF_4, PF_5, SF_4
Options:
(a) XeF_2
(b) XeF_4
(c) PF_5
(d) SF_4
Answer: (d)

Question: For the reversible reaction $A(g) \leftrightharpoons B(g) + C(g)$. The degree of dissociation is α at pressure P_T, then
Options:
(a) If $P_T >> K_P$, then $a \approx 1$
(b) If P_T increases, then α decreases
(c) If P_T increases, then α increases
(d) If $K_P >> P_T$, then α tend to 0
Answer: (b)

Question: The number of unpaired electrons and hybridisation of $[Mn(CN)_6]^{3-}$, respectively are:-
Options:
(a) 4 and $d^2 sp^3$
(b) 4 and sp^3d^2
(c) 2 and d^2sp^3
(d) 2 and sp^3d^2
Answer: (c)

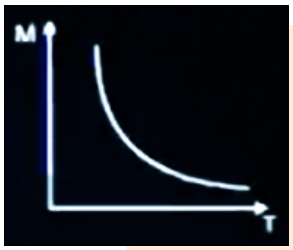
Question: Consider the following statements
(A) Value of l gives shape of orbital
(B) Ψ represent wave function of an electron
(c) Electron density of p_x orbital in xy plane is zero
(D) $2p_x$ orbital is 

The correct statement(s) are

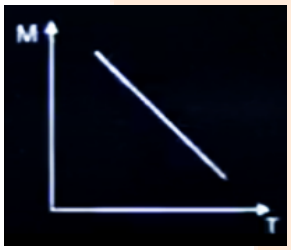
Options:
(a) (A) and (D) only
(b) (A), (C) and (D) only
(c) (A), (B) and (D) only
(d) (A), (B), (C) and (D) only

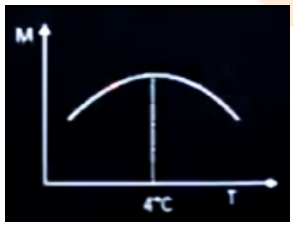
Answer: (c)

Question: The d-orbital electronic configuration of the complex among $[Co(en)_3]^{3+}$, $[Co(F)_6]^{3-}$, $[Mn(H_2O)_6]^{2+}$ and $[Zn(H_2O)_6]^{2}$ that has highest CFSE is
Options:
(a) $t_{2g}^3\ eg^2$
(b) $t_{2g}^6\ eg^4$
(c) $t_{2g}^6\ eg^0$
(d) $t_{2g}^4\ eg^2$
Answer: (c)

Question: 1 M NaCl solution is prepared at 0°C in H_2O. Now it is heated, then find correct graph between molarity and temperature
Options:
(a) 

(b) 

(c) 

(d) 

Answer: (d)

Question: Concentration Vs-time graph for first order reaction is given
Find out time required for concentration to become 2.5 M (in min) (Nearest integer)
Options:

Answer: (65)

Question: If the percentage w/v for NaOH is 0.2 and resistivity is 870 milliohm metre. Then, calculate Λ_m (in S cm^2 mol^{-1})
Options:

Answer: (23)

Question: 0.5 g organic compound is heated with CuO in a CO_2 atmosphere at 300 K. The volume of N_2 gas collected over H_2O is 60 mL, if aqueous tension is 15 mm Hg at 300 K and pressure recorded is 715 mmHg, then calculate percentage of nitrogen in organic compound

Answer: (13%)