

JEE Main 2022 Question Paper

PDF Chemistry Jul 29 Shift 2

Topic:	Chemistry-Section A
Item No:	61
Question ID:	1269461
Question Type:	MCQ
Question:	Consider the reaction $4 \text{HNO}_3(\text{l}) + 3 \text{KCl}(\text{s}) \rightarrow \text{Cl}_2(\text{g}) + \text{NOCl}(\text{g}) + 2 \text{H}_2\text{O}(\text{g}) + 3 \text{KNO}_3(\text{s})$ The amount of HNO_3 required to produce 110.0 g of KNO_3 is (Given: Atomic masses of H, O, N and K are 1, 16, 14 and 39, respectively.)
A:	32.2 g
B:	69.4 g
C:	91.5 g

D:	162.5 g
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Topic:	Chemistry-Section A
Item No:	62
Question ID:	1269462
Question Type:	MCQ
Question:	Given below are the quantum numbers for 4 electrons. A. $n = 3, l = 2, m_l = 1, m_s = +1/2$ B. $n = 4, l = 1, m_l = 0, m_s = +1/2$ C. $n = 4, l = 2, m_l = -2, m_s = -1/2$ D. $n = 3, l = 1, m_l = -1, m_s = +1/2$ The correct order of increasing energy is
A:	$D < B < A < C$
B:	$D < A < B < C$
C:	$B < D < A < C$
D:	$B < D < C < A$

Topic:	Chemistry-Section A
Item No:	63
Question ID:	1269463
Question Type:	MCQ
Question:	$C(s) + O_2(g) \rightarrow CO_2(g) + 400 \text{ kJ}$ $C(s) + \frac{1}{2}O_2(g) \rightarrow CO(g) + 100 \text{ kJ}$ When coal of purity 60% is allowed to burn in presence of insufficient oxygen, 60% of carbon is converted into 'CO' and the remaining is converted into 'CO₂'. The heat generated when 0.6 kg of coal is burnt is _____.
A:	1600 kJ
B:	3200 kJ
C:	4400 kJ
D:	6600 kJ

Topic:	Chemistry-Section A
Item No:	64
Question ID:	1269464
Question Type:	MCQ
Question:	200 mL of 0.01 M HCl is mixed with 400 mL of 0.01M H₂SO₄. The pH of the mixture is ____. Given: $\log 2 = 0.30, \log 3 = 0.48, \log 5 = 0.70, \log 7 = 0.84, \log 11 = 1.04$
A:	1.14

B:	1.78
C:	2.34
D:	3.02

Topic:	Chemistry-Section A											
Item No:	65											
Question ID:	1269465											
Question Type:	MCQ											
Question:	Given below are the critical temperatures of some of the gases: <table><tr><th>Gas</th><th>Critical temperature (K)</th></tr><tr><td>He</td><td>5.2</td></tr><tr><td>CH₄</td><td>190.0</td></tr><tr><td>CO₂</td><td>304.2</td></tr><tr><td>NH₃</td><td>405.5</td></tr></table> The gas showing least adsorption on a definite amount of charcoal is		Gas	Critical temperature (K)	He	5.2	CH ₄	190.0	CO ₂	304.2	NH ₃	405.5
Gas	Critical temperature (K)											
He	5.2											
CH ₄	190.0											
CO ₂	304.2											
NH ₃	405.5											
A:	He											
B:	CH ₄											
C:	CO ₂											
D:	NH ₃											

Topic:	Chemistry-Section A	
Item No:	66	
Question ID:	1269466	
Question Type:	MCQ	
Question:	In liquation process used for tin (Sn), the metal	
A:	is reacted with acid.	
B:	is dissolved in water.	
C:	is brought to molten form which is made to flow on a slope.	
D:	is fused with NaOH	

Topic:	Chemistry-Section A	
Item No:	67	
Question ID:	1269467	
Question Type:	MCQ	

Question:	Given below are two statements. Statement I: Stannane is an example of a molecular hydride. Statement II: Stannane is a planar molecule. In the light of the above statement, choose the <i>most appropriate</i> answer from the options given below.
A:	Both Statement I and Statement II are true.
B:	Both Statement I and Statement II are false.
C:	Statement I is true but Statement II is false.
D:	Statement I is false but Statement II is true.

Topic:	Chemistry-Section A
Item No:	68
Question ID:	1269468
Question Type:	MCQ
Question:	Portland cement contains 'X' to enhance the setting time. What is 'X'?
A:	$\text{CaSO}_4 \cdot \frac{1}{2} \text{H}_2\text{O}$
B:	$\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$
C:	CaSO_4
D:	CaCO_3

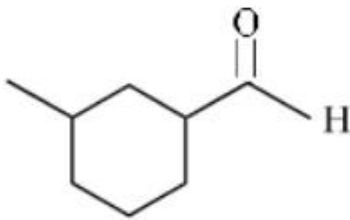
Topic:	Chemistry-Section A
Item No:	69
Question ID:	1269469
Question Type:	MCQ
Question:	When borax is heated with CoO on a platinum loop, blue coloured bead formed is largely due to
A:	B_2O_3
B:	$\text{Co}(\text{BO}_2)_2$
C:	CoB_4O_7
D:	$\text{Co}[\text{B}_4\text{O}_5(\text{OH})_4]$

Topic:	Chemistry-Section A
Item No:	70
Question ID:	1269470
Question Type:	MCQ
Question:	Which of the following 3d-metal ion will give the lowest enthalpy of hydration ($\Delta_{\text{hyd}}H$) when dissolved in water ?
A:	Cr^{2+}

B:	Mn^{2+}
C:	Fe^{2+}
D:	Co^{2+}

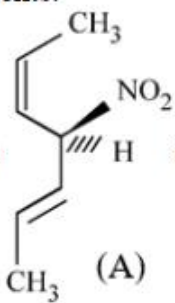
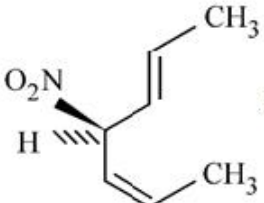
Topic:	Chemistry-Section A
Item No:	71
Question ID:	1269471
Question Type:	MCQ
Question:	Octahedral complexes of copper(II) undergo structural distortion (Jahn-Teller). Which one of the given copper (II) complexes will show the maximum structural distortion?(en – ethylenediamine; $\text{H}_2\text{N}-\text{CH}_2-\text{CH}_2-\text{NH}_2$)
A:	$[\text{Cu}(\text{H}_2\text{O})_6]\text{SO}_4$
B:	$[\text{Cu}(\text{en})(\text{H}_2\text{O})_4]\text{SO}_4$
C:	cis- $[\text{Cu}(\text{en})_2\text{Cl}_2]$
D:	trans- $[\text{Cu}(\text{en})_2\text{Cl}_2]$

Topic:	Chemistry-Section A
Item No:	72
Question ID:	1269472
Question Type:	MCQ
Question:	Dinitrogen is a robust compound, but reacts at high altitudes to form oxides. The oxide of nitrogen that can damage plant leaves and retard photosynthesis is
A:	NO
B:	NO_3^-
C:	NO_2
D:	NO_2^-

Topic:	Chemistry-Section A
Item No:	73
Question ID:	1269473
Question Type:	MCQ
Question:	Correct structure of γ -methylcyclohexane carbaldehyde is
A:	

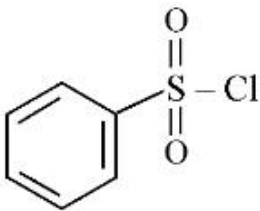
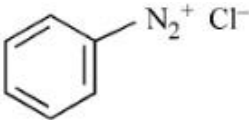
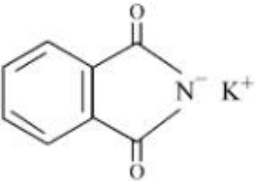
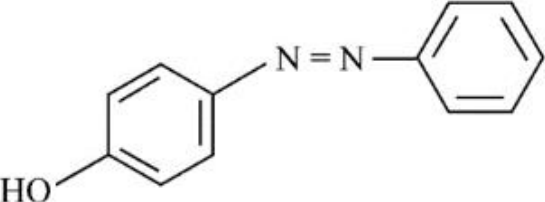
B:	
C:	
D:	

Topic:	Chemistry-Section A
Item No:	74
Question ID:	1269474
Question Type:	MCQ
Question:	Compound 'A' undergoes following sequence of reactions to give compound 'B'. The correct structure and chirality of compound 'B' is [where Et is $-C_2H_5$] Compound 'A'
A:	, Achiral
B:	, Chiral
C:	, Chiral
D:	, Achiral

Topic:	Chemistry-Section A
Item No:	75
Question ID:	1269475
Question Type:	MCQ
Question:	Given below are two statements. Statement I: The compound  is optically active. Statement II:  is mirror image of above compound A. In the light of the above statement, choose the <i>most appropriate</i> answer from the options given below.
A:	Both Statement I and Statement II are correct.
B:	Both Statement I and Statement II are incorrect.
C:	Statement I is correct but Statement II is incorrect.
D:	Statement I is incorrect but Statement II is correct.

Topic:	Chemistry-Section A
Item No:	76
Question ID:	1269476
Question Type:	MCQ
Question:	When ethanol is heated with conc. H_2SO_4 , a gas is produced. The compound formed, when this gas is treated with cold dilute aqueous solution of Baeyer's reagent, is
A:	formaldehyde
B:	formic acid
C:	glycol
D:	ethanoic acid

Topic:	Chemistry-Section A
Item No:	77
Question ID:	1269477
Question Type:	MCQ

Question:	The Hinsberg reagent is
A:	
B:	
C:	
D:	

Topic:	Chemistry-Section A
Item No:	78
Question ID:	1269478
Question Type:	MCQ
Question:	Which of the following is NOT a natural polymer?
A:	Protein
B:	Starch
C:	Rubber
D:	Rayon

Topic:	Chemistry-Section A
Item No:	79
Question ID:	1269479
Question Type:	MCQ
Question:	Given below are two statements. One is labelled as Assertion A and the other is labelled as Reason R. Assertion A: Amylose is insoluble in water. Reason R: Amylose is a long linear molecule with more than 200 glucose units. In the light of the above statements, choose the <i>correct</i> answer from the options given below.
A:	Both A and R are correct and R is the correct explanation of A .

B:	Both A and R are correct but R is NOT the correct explanation of A .
C:	A is correct but R is not correct
D:	A is not correct but R is correct.

Topic:	Chemistry-Section A
Item No:	80
Question ID:	1269480
Question Type:	MCQ
Question:	A compound 'X' is a weak acid and it exhibits colour change at pH close to the equivalence point during neutralization of NaOH with CH ₃ COOH. Compound 'X' exists in ionized form in basic medium. The compound 'X' is
A:	methyl orange
B:	methyl red
C:	phenolphthalein
D:	erichrome Black T

Topic:	Chemistry-Section B
Item No:	81
Question ID:	1269481
Question Type:	Numeric Answer
Question:	'x' g of molecular oxygen (O₂) is mixed with 200 g of neon (Ne). The total pressure of the non-reactive mixture of O₂ and Ne in the cylinder is 25 bar. The partial pressure of Ne is 20 bar at the same temperature and volume. The value of 'x' is ____. [Given: Molar mass of O₂ = 32 g mol⁻¹. Molar mass of Ne = 20 g mol⁻¹]

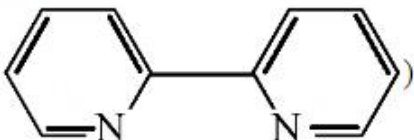
Topic:	Chemistry-Section B
Item No:	82
Question ID:	1269482
Question Type:	Numeric Answer
Question:	Consider, PF₅, BrF₅, PCl₃, SF₆, [ICl₄]⁻, ClF₃ and IF₅. Amongst the above molecule(s)/ion(s), the number of molecule(s)/ion(s) having sp³d² hybridisation is ____.

Topic:	Chemistry-Section B
Item No:	83
Question ID:	1269483

Question Type:	Numeric Answer
Question:	1.80 g of solute A was dissolved in 62.5 cm ³ of ethanol and freezing point of the solution was found to be 155.1 K. The molar mass of solute A is ___ g mol ⁻¹ . [Given: Freezing point of ethanol is 156.0 K. Density of ethanol is 0.80 g cm ⁻³ . Freezing point depression constant of ethanol is 2.00 K kg mol ⁻¹]

Topic:	Chemistry-Section B
Item No:	84
Question ID:	1269484
Question Type:	Numeric Answer
Question:	For a cell, Cu(s) Cu ²⁺ (0.001M) Ag ⁺ (0.01M) Ag(s) the cell potential is found to be 0.43 V at 298 K. The magnitude of standard electrode potential for Cu ²⁺ /Cu is ____ × 10 ⁻² V. [Given : E [⊖] _{Ag⁺/Ag} = 0.80 V and $\frac{2.303RT}{F} = 0.06$ V]

Topic:	Chemistry-Section B
Item No:	85
Question ID:	1269485
Question Type:	Numeric Answer
Question:	Assuming 1 μg of trace radioactive element X with a half life of 30 years is absorbed by a growing tree. The amount of X remaining in the tree after 100 years is ____ × 10 ⁻¹ μg. [Given: ln 10 = 2.303; log 2 = 0.30]

Topic:	Chemistry-Section B
Item No:	86
Question ID:	1269486
Question Type:	Numeric Answer
Question:	Sum of oxidation state (magnitude) and coordination number of cobalt in Na[Co(bpy)Cl ₄] is ____. (Given: bpy = )

Topic:	Chemistry-Section B
Item No:	87
Question ID:	1269487

Question Type:	Numeric Answer
Question:	Consider the following sulphur based oxoacids. H_2SO_3 , H_2SO_4 , $\text{H}_2\text{S}_2\text{O}_8$ and $\text{H}_2\text{S}_2\text{O}_7$. Amongst these oxoacids, the number of those with peroxo (O-O) bond is _____

Topic:	Chemistry-Section B
Item No:	88
Question ID:	1269488
Question Type:	Numeric Answer
Question:	A 1.84 mg sample of polyhydric alcoholic compound 'X' of molar mass 92.0 g/mol gave 1.344 mL of H_2 gas at STP. The number of alcoholic hydrogens present in compound 'X' is _____.

Topic:	Chemistry-Section B
Item No:	89
Question ID:	1269489
Question Type:	Numeric Answer
Question:	The number of stereoisomers formed in a reaction of $(\pm)\text{Ph}(\text{C}=\text{O})\text{C}(\text{OH})(\text{CN})\text{Ph}$ with HCN is _____. [where Ph is $-\text{C}_6\text{H}_5$]

Topic:	Chemistry-Section B
Item No:	90
Question ID:	1269490
Question Type:	Numeric Answer
Question:	The number of chlorine atoms in bithionol is _____.