Q.# /Part #	Criteria	Level 1 (Marks)	Level 2(Marks)	Level 3 (Marks)	Level 4 (Marks)	Level 5 (Marks)	Level 6 (Marks)	Level 7 (Marks)
2(i)	Differentiating between limiting and non limiting reactants and use of expensive and inexpensive reactants in industrial processes	Writing correct differentiation between limiting and non-limiting reactants (1.5)	Partially correct response (1)	Some relevant information (0.5)	Wrong answer (0)			
		Writing correct explanation of use of expensive and inexpensive reactants in industrial processes (1.5)	Partially correct response (1)	Some relevant information (0.5)	Wrong answer (0)			
2(ii)	Calculating the mass of Fe to produce 200g of $FeCl_3$	Correct calculation of Fe (by any method) (3)	Partially Correct calculation of Fe (2)	Some relevant information (1)	Wrong answer (0)			
2(iii)	Production of X-Rays and types of spectral lines produced	Writing correct description of X-Rays production (2)	Partially correct response (1)	Some relevant information (0.5)	Wrong answer (0)			
		Writing correct types of spectral lines (1)	Partially correct response (0.5)	Wrong answer (0)				
2(iv)	Calculation of wave number of limiting line in Balmer series	Writing correct calculation of wave number for limiting line of Balmer series (3)	Partially Correct calculation of wave number of limiting line for Balmer series (2)	Some relevant information (1)	Wrong answer (0)			
2(v)	Differentiating the structure of $BeCl_2$ and $SnCl_2$ by applying VSEPR theory	Writing correct differentiation by drawing structures of $BeCl_2$ and $SnCl_2$ (3)	Partially correct response i.e differentiation without structure (2)	Some relevant information (1)	Wrong answer (0)			
2(vi)	Description of any two factors which affect bond energy with examples	Writing correct explanation of any one factor with example (1.5)	Writing correct explanation of any one factor without example (1)	Some relevant information (0.5)	Wrong answer (0)			
		Writing correct explanation of second factor with example (1.5)	Writing correct explanation of any second factor without example (1)	Some relevant information (0.5)	Wrong answer (0)			
2(vii)	Description of absolute zero and its derivation from Critical form of Charles' law	Writing correct description of absolute zero (1)	Partially correct response (0.5)	Wrong answer (0)				
		Writing correct derivation of critical form from Charles' law (2)	Partially Correct derivation (1)	Some relevant information (0.5)	Wrong answer (0)			
2(viii)	Calculating molar mass and	Writing correct calculation	Partially Correct	Some relevant	Wrong answer			

Q.# /Part #	Criteria	Level 1 (Marks)	Level 2(Marks)	Level 3 (Marks)	Level 4 (Marks)	Level 5 (Marks)	Level 6 (Marks)	Level 7 (Marks)
	identifying of gas produced by combustion of hydrocarbons	of molar mass of unknown gas (2)	calculation of molar mass of unknown gas (1)	information (0.5)	(0)			
		Writing correct identification (1)	Wrong answer (0)					
$2(ix)$	Justification/Description of increase of boiling points of noble gases from He to Rn	Writing correct description/justification (Name of London dispersion forces with reason) (3)	Partially Correct description (2)	Some relevant information (1)	Wrong answer (0)			
$2(x)$	Justifying the order of boiling points for following hydrides	Writing correct justification of $H_2O>HF$ (water has two hydrogen bonds while HF has one) (1)	Partially correct response (0.5)	Wrong answer (0)				
		Writing correct justification of $HF>HCl$ (1)	Partially correct response (0.5)	Wrong answer (0)				
		Writing correct justification of $SiH_4>CH_4$	Partially correct response (0.5)	Wrong answer (0)				
$2(xi)$	Description/Definition and justification of cleavage plane as an anisotropic property	Writing correct description/definition of cleavage plane (2)	Partially correct response (1.5)	Some relevant information (01)	Wrong answer (0)			
		Writing correct justification for anisotropic behavior of cleavage plane (1)	Partially Correct justification (1)	Some relevant information (0.5)	Wrong answer (0)			
$2(xii)$	Differentiation between metallic and molecular solids	Writing any three correct differences (3)	Writing any correct two differences (2)	Writing any one correct difference (1)	Wrong answer (0)			
2(xiii)	Recognition of reaction at equilibrium by spectroscopic method	Writing correct recognition/description of reaction at equilibrium by spectroscopic method (3)	Partially Correct response (2)	Some relevant information (1)	Wrong answer (0)			
$2(xiv)$	Describing the effect of increase in temperature on equilibrium position and equilibrium constant	Writing the correct description of effect of increasing in temperature on equilibrium position (1.5)	Partially Correct response (1)	Some relevant information (0.5)	Wrong answer (0)			
		Writing the correct description of effect of increasing in temperature on equilibrium constant (1.5)	Partially Correct response (1)	Some relevant information (0.5)	Wrong answer (0)			

Q.# /Part #	Criteria	Level 1 (Marks)	Level 2(Marks)	Level 3 (Marks)	Level 4 (Marks)	Level 5 (Marks)	Level 6 (Marks)	Level 7 (Marks)
2(xv)	Description/Definition of levelling effect and explaining that H_2O exhibits this phenomenon whereas CH_3COOH does not.	Writing correct description/definition of levelling effect (1)	Partially correct response (0.5)	Wrong answer (0)				
		Writing correct reason/description (2)	Partially Correct response (1)	Some relevant information (0.5)	Wrong answer (0)			
2(xvi)	Determination of change in pH on addition of 0.1 M solution of NaOH in buffer	Writing correct calculation of pH (3)	Partially Correct response (2)	Some relevant information (1)	Wrong answer (0)			
2(xvii)	Suggesting the mechanism for reaction $2No+2H_2 \rightarrow N_2+2H_2O$	Suggesting the correct mechanism (3)	Partially Correct response (2)	Some relevant information (1)	Wrong answer (0)			
2(xviii)	Describing the effect of temperature on solubility of solids and gasses in liquids	Writing correct description of effect of temperature on solubility of solids in liquids (2)	Partially Correct response (1)	Some relevant information (0.5)	Wrong answer (0)			
		Writing correct description of effect of temperature on solubility of gasses in liquids (1)	Partially Correct response (0.5)	Some relevant information (0.5)	Wrong answer (0)			
2(xix)	Determining the enthalpy of sublimation of I_2	Writing correct calculation for sublimation of I_2 (3)	Partially Correct response (2)	Some relevant information (1)	Wrong answer (0)			
2(xx)	Describing galvanizing and explaining it as sacrificial corrosion	Writing correct description of galvanizing (1)	Partially correct response (0.5)	Wrong answer (0)				
		Writing correct description of sacrificial corrosion (2)	Partially Correct response (1)	Some relevant information (0.5)	Wrong answer (0)			
3(a)	Differentiation between Sp^3 and Sp^2 modes of hybridization and explaining the formation of ethene molecule on the basis of hybridization in C-atoms	Writing correct differentiation between Sp^3 and Sp^2 modes of hybridization (3)	Partially Correct response (2)	Some relevant information (1)	Wrong answer (0)			
		Describing correct formation of ethene molecule on the basis of hybridization (2)	Describing partially correct formation of ethene molecule on the basis of hybridization in C-atoms (1.5)	Some relevant information (1)	Wrong answer (0)			

Q.# /Part #	Criteria	Level 1 (Marks)	Level 2(Marks)	Level 3 (Marks)	Level 4 (Marks)	Level 5 (Marks)	Level 6 (Marks)	Level 7 (Marks)
		Drawing correct formation of ethene molecule on the basis of hybridization (2)	Drawing partially correct formation of ethene molecule on the basis of hybridization in C-atoms (1.5)	Some relevant information (1)	Wrong answer (0)			
3(b)	Explain the reasons for the following facts i. vapour pressure of ether is higher than water ii. cooking of food in less time in pressure cooker iii. vacuum distillation purify sensitive liquids	Writing correct explanation of higher vapour pressure of ether than water (2)	Partially Correct response (1)	Some relevant information (0.5)	Wrong answer (0)			
		Writing correct explanation of cooking of food in less time in pressure cooker (2)	Partially Correct response (1)	Some relevant information (0.5)	Wrong answer (0)			
		Writing correct explanation of vacuum distillation to purify sensitive liquids (2)	Partially Correct response (1)	Some relevant information (0.5)	Wrong answer (0)			
4 (a)	Reasoning of decrease in freezing point, when non-volatile, non-electrolyte solute is added to a solvent and calculation of freezing point of coolant	Writing correct reason of decrease in freezing point, when non-volatile, non-electrolyte solute is added to a solvent (3)	Partially Correct response (2)	Some relevant information (1)	Wrong answer (0)			
		Writing correct calculation of freezing point of coolant (Data, Formula, Calculation and $\Delta T_f = T_1 - T_2$) (4)	Writing correct calculation of freezing point of coolant (Data, Formula, Calculation) (3)	Writing correct calculation of freezing point of coolant (Data, Formula, (02)	any relevant calculation (01)	Wrong answer (0)		
4 (b)	Stating and explaining Faraday's 1st and 2nd laws of electrolysis	Writing correct statement and explanation of Faraday's 1st law (3)	Partially Correct response (2)	Some relevant information (1)	Wrong answer (0)			
		Writing correct statement and explanation of Faraday's 2nd law (3)	Partially Correct response (2)	Some relevant information (1)	Wrong answer (0)			
5 (a)	Deviation of real gas from ideal behavior and explaining deviations at high pressure and low temperature with the help of diagram	Writing correct description of deviation (1)	Partially correct response (0.5)	Wrong answer (0)				
		Writing correct explanation of deviation at high pressure with diagram (3)	Partially Correct response (2)	Some relevant information (1)	Wrong answer (0)			

Q.# /Part #	Criteria	Level 1 (Marks)	Level 2(Marks)	Level 3 (Marks)	Level 4 (Marks)	Level 5 (Marks)	Level 6 (Marks)	Level 7 (Marks)
		Writing correct explanation of deviation at low temperature with diagram (3)	Partially Correct response (2)	Some relevant information (1)	Wrong answer (0)			
5 (b)	Stating Hess's law with example, writing its two indirect applications and determining the enthalpy of reaction from heats of formation	Writing correct statement with example (2)	Partially Correct response (1)	Some relevant information (0.5)	Wrong answer (0)			
		Writing two correct indirect applications (only to write Lattice energy and enthalpy calculation) (2)	Writing any one correct indirect application (1)	Some relevant information (0.5)	Wrong answer (0)			
		Writing correct determination/explanation of the enthalpy of reaction from heats of formation (2) $(\Delta H = Coef. \Sigma \Delta H(\text{products}) - Coef. \Sigma \Delta H(Reactants)$	Partially Correct response (1)	Some relevant information (0.5)	Wrong answer (0)			

Note: All the markers must know the solutions of all the question items of the question paper before starting marking.