UNIT 5B PRACTICE QUIZ 1 – OXIDATION AND REDUCTION

Consider the following reactions and use them to answer Questions 1 – 7:

Reaction V	$H_2SO_4 + 8HI \rightarrow H_2S + 4I_2 + 4H_2O$
Reaction W	$Na_2S_2O_3 + 2HCl \rightarrow S + SO_2 + H_2O + 2NaCl$
Reaction X	$H_2SO_4 + K_2CO_3 \rightarrow K_2SO_4 + CO_2 + H_2O$
Reaction Y	$MnO_4^- + 8H^+ + 5Fe^{2+} \rightarrow Mn^{2+} + 4H_2O + 5Fe^{3+}$
Reaction Z	$C_2H_6 + 3.5O_2 \rightarrow 2CO_2 + 3H_2O$

1.	Which of the above reactions is not a redox reaction? Reaction X; none of the oxidation numbers change (it is an acid-base reaction)
2.	What is the oxidation number of S in $Na_2S_2O_3$ (Reaction W)? +2
3.	What happens to the oxidation number of S in Reaction V? It decreases from +6 (in H_2SO_4) to -2 (in H_2S)
4.	What is reduced in Reaction Y? The Mn (in MnO_4^-) from +7 to +2 (in Mn^{2+})
5.	What is the reducing agent in Reaction Z? C_2H_6, because the C is oxidised in the reaction (from -3 in C_2H_6 to +4 in CO_2)
6.	In which reaction does the oxidation number of one atom increase by 7? In reaction Z, the oxidation number of C increases from -3 in C_2H_6 to +4 in CO_2
7.	Which reaction is a disproportionation reaction? Reaction W; the S is both oxidized and reduced (from +2 to 0 and +4)

8.	Which of the following is a correct reduction half-equation?		
	A	$2I^- + 2e^- \rightarrow I_2$	this is nonsense
	B	$I_2 \rightarrow 2I^- + e^-$	should be $I_2 \rightarrow 2I^- + 2e^-$ but would be oxidation anyway
	C	$2I^- \rightarrow I_2 + 2e^-$	this is a correct oxidation half-equation
√	**D**	$I_2 + 2e^- \rightarrow 2I^-$	this is a correct reduction half-equation
	E	$I_2 + e^- \rightarrow 2I^-$	Should be $I_2 + 2e^- \rightarrow 2I^-$

9.	When the following half-equations: $V \rightarrow V^{3+} + 3e^-$, $Cu^{2+} + 2e^- \rightarrow Cu$ are combined, what is the redox reaction obtained?		
	A	$V + Cu^{2+} \rightarrow V^{3+} + Cu$	charges are not balanced (+2 on left, +3 on right)
	B	$V + Cu^{2+} \rightarrow V^{3+} + Cu + e^-$	charges are balanced but electrons haven't been cancelled
√	**C**	$2V + 3Cu^{2+} \rightarrow 2V^{3+} + 3Cu$	correct
	D	$3V + 2Cu^{2+} \rightarrow 3V^{3+} + 2Cu$	charges are not balanced (+4 on left, +6 on right)
	E	None of the above	no because C is correct

10.	Consider the following redox reaction: $Zn + 2Fe^{3+} \rightarrow Zn^{2+} + 2Fe^{2+}$ Which of the following is the oxidation half-equation for this reaction?		
√	**A**	$Zn \rightarrow Zn^{2+} + 2e^-$	correct
	B	$Zn + 2e^- \rightarrow Zn^{2+}$	Nonsense
	C	$Fe^{3+} + e^- \rightarrow Fe^{2+}$	this is the reduction half-equation
	D	$Fe^{3+} \rightarrow Fe^{2+} + e^-$	nonsense
	E	$Zn \rightarrow Zn^{2+} + e^-$	Not balanced, should be $Zn \rightarrow Zn^{2+} + 2e^-$

[Here is the link to the answer sheet]