Mark Scheme

Q1.

Question Number	Answer	Mark
	The only correct answer is D (none of these three indicators) ***A*** *is incorrect because both acid and base are weak so pH range at equivalence is too narrow for bromothymol blue to change colour* ***B*** *is incorrect because both acid and base are weak so pH range at equivalence is too narrow for methyl orange to change colour* ***C*** *is incorrect because both acid and base are weak so pH range at equivalence is too narrow for phenolphthalein to change colour*	**(1)**

Q2.

Question Number	Answer	Mark
	The only correct answer is D (resists changes in pH if small quantities of acid or base are added) **A** *is not correct because buffer solutions can be alkaline or acidic* **B** *is not correct because buffers do not always contain equal numbers of moles of the acid and its conjugate base* **C** *is not correct because a buffer does not prevent any change in pH*	**(1)**

Q3.

Question Number	Answer	Mark
	The only correct answer is B ($NaOH(aq)$ and excess $CH_3COOH(aq)$) ***A*** *is incorrect because the solutions would not form a buffer* ***C*** *is incorrect because the solutions would not form a buffer* ***D*** *is incorrect because the solutions would not form a buffer*	**(1)**

Q4.

Question Number	Answer	Mark
	The only correct answer is A ($CH_3COOH > CH_2ClCOOH > HCl$) *B is incorrect because HCl is the only strong acid, so would have the lowest pH* *C is incorrect because $CH_2ClCOOH$ is stronger than CH_3COOH as the Cl atom stabilises the anion* *D is incorrect because the stronger the acid the lower the pH, hence these are in reverse order*	(1)

Q5.

Question number	Answer	Mark
	The only correct answer is A (solution **J**: HCl(aq) and NH_3(aq), solution **K**: CH_3COOH(aq) and NaOH(aq)) ***B*** *is incorrect because the salt formed from a strong acid (HCl) and a strong base (NaOH) will have pH 7 while that formed from a weak acid (CH_3COOH) and a weak base (NH_3) will have pH close to 7* ***C*** *is incorrect because the salt formed from a weak acid and a strong base will have a pH of about 9 while that formed from a strong acid and a strong base will have pH 7* ***D*** *is incorrect because the salt formed from a weak acid and a weak base will have a pH of about 7 while that formed from a strong acid and a weak base will have pH of about 5*	(1)

Q6.

Question Number	Answer	Mark
	The only correct answer is B ***A*** *is not correct because it is the conjugate base not acid* ***C*** *is not correct because it is not the conjugate acid* ***D*** *is not correct because it is not the conjugate acid*	(1)

Q7.

Question Number	Answer	Mark
	The only correct answer is C (H_2O and OH^-) **A** *is not correct because ammonia is acting as a base and not an acid* **B** *is not correct because this is the base – conjugate acid pair* **D** *is not correct because water and the ammonium ion are not an acid-conjugate base pair*	(1)

Q8.

Question Number	Acceptable Answer	Mark
	The only correct answer is C ***A*** *is not correct because this is the appearance of the solution before the potassium hydroxide is added* ***B*** *is not correct because this is the colour that methyl orange would be in neutral solution* ***D*** *is not correct because this is a colour sometimes given for the end-point which is incorrect, and it is the colour of phenolphthalein in acidic solution*	(1)

Q9.

Question Number	Answer	Mark
	The only correct answer is C ***A*** *is not correct because this is the reverse of the correct colour change* ***B*** *is not correct because this is doing the reverse titration (acid in flask and carbonate in burette)* ***D*** *is not correct because this is going beyond the endpoint to an acidic solution*	(1)

Q10.

Question Number	Acceptable Answer	Mark
	The only correct answer is C ***A*** *is not correct because a burette is used to measure varied volumes* ***B*** *is not correct because a measuring cylinder is less precise* ***D*** *is not correct because a volumetric flask is less precise*	**(1)**