Mark Scheme

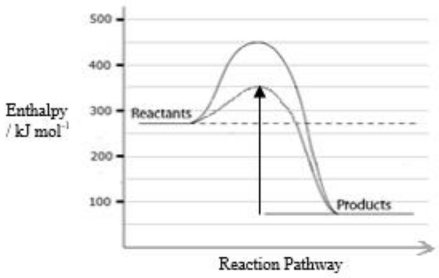
Q1.

Question Number	Acceptable Answer	Mark
	The only correct answer is B ***A*** *is not correct because there is no increase in number of particles* ***C*** *is not correct because distribution broadens as temperature rises, so peak is lower* ***D*** *is not correct because* E_a *is an intrinsic property of the reaction, not the applied temperature*	**(1)**

Q2.

Question Number	Answer	Mark
	The only correct answer is **D** (the minimum energy required for a reaction to occur) ***A*** *is not correct because it is the minimum energy of particles not the average* ***B*** *is not correct because that is the energy change for the reaction* ***C*** *is not correct because that will not necessarily result in a reaction if the energy is too small*	**(1)**

Q3.

Question Number	Answer	Mark
(i)	The only correct answer is **C**  ***A*** *is not correct because this is the activation energy for the uncatalysed forward reaction* ***B*** *is not correct because this is the activation energy for the catalysed forward reaction* ***D*** *is not correct because this is the activation energy for the uncatalysed backward reaction*	**(1)**

Question Number	Answer	Mark
(ii)	The only correct answer is **B** (100 kJ mol^{-1}) ***A*** *is not correct because this is the activation energy in the forward direction for the catalysed reaction* ***C*** *is not correct because this is the activation energy in the forward direction for the uncatalysed reaction* ***D*** *is not correct because this is the value of ΔH*	**(1)**

Q4.

Question Number	Answer	Mark
	The only correct answer is A (area A) ***B*** *is not correct because this is the area representing the number of particles with sufficient energy to react in the absence of a catalyst* ***C*** *is not correct because this area subtraction does not represent the increase in the number of particles with sufficient energy to react* ***D*** *is not correct because this sum of areas represents the total number of particles with sufficient energy to react in the presence of a catalyst*	**(1)**

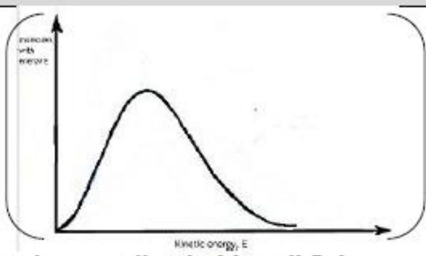
Q5.

Question Number	Answer	Mark
	The only correct answer is **D** (is often a porous material, so increasing the surface area) ***A** is not correct because though it increases the rate it does take part in, but is not used up by, the reaction* ***B** is not correct because the yield at equilibrium is not affected by the catalyst* ***C** is not correct because a heterogenous catalyst is in a different phase, while a homogeneous catalyst is in the same phase*	**(1)**

Q6.

Question Number	Acceptable Answer	Mark
	The only correct answer is **C** ***A** is incorrect because gaseous reactants attach only to the surface* ***B** is incorrect because this happens after adsorption* ***D** is incorrect because this is detachment of the products from the surface*	**(1)**

Q7.

Question Number	Answer	Mark
	The only correct answer is A  **B** *is not correct because a catalyst does not affect the Maxwell-Boltzmann distribution of molecular energies at the same T and P. This curve would be expected from a decrease in temperature.* **C** *is not correct because a catalyst does not affect the Maxwell-Boltzmann distribution of molecular energies at the same T and P. This curve would be expected from an increase in temperature.* **D** *is not correct because the area under the curve has increased, so the number of molecules has increased.*	(1)

Q8.

Question Number	Answer	Mark
(i)	The only correct answer is **C** ($Y + Z$) ***A*** *is not correct because this is the number of extra molecules which react when the catalyst is added* ***B*** *is not correct because Z should be added to Y, not subtracted from it* ***D*** *is not correct because this is the number of molecules which react without the catalyst added*	**(1)**

Question Number	Answer	Mark
(ii)	The only correct answer is **A** (Decreasing the temperature of the gas) ***B*** *is not correct because this will not change the number of molecules in area Y* ***C*** *is not correct because this will increase the number of molecules in area Y* ***D*** *is not correct because this will leave the number of molecules in area Y unchanged*	**(1)**