AS Level Decision 1

	What You Need To Know			
1. Simple Ideas of Algorithms	• Correctness, finiteness and generality. • Stopping conditions • To trace, correct, complete or amend a given algorithm. • Bubble, shuttle, shell and quicksort algorithms and the number of iterations required.			
2. Graphs and Networks	• Vertices, edges, edge weights, paths, cycles and simple graphs. • Adjacency/distance matrices. • Connectedness • Directed and undirected graphs. • Degree of a vertex, odd and even vertices, Eulerian trails and Hamiltonian cycles. • Trees • Bipartite graphs.			
3. Spanning Tree Problems	• Prim's and Kruskal's algorithm to find minimum spanning trees. • Relative advantage of 2 algorithms • Greediness			
4. Matching	• Use bipartite graphs, and use of alternating paths. • Improvement of matching of algorithm			
5. Shortest Paths Networks	• Dijkstra's algorithm, including labelling technique to identify shortest path.			
6. Route Inspection Problem	• Chinese Postman Problem, looking at odd vertices of no more than 4.			
7. Travelling Salesperson Problem	• Conversion of a practical problem into classical problem of finding a Hamiltonian cycle. • Determination of upper bounds by nearest neighbour algorithm. • Determination of lower bounds on route length using minimum spanning trees. • Comment on the appropriateness of solution in its context.			
8. Linear Programming	• Graphical solution of two-variable problems. • Formulate problems as linear programmes with a maximum of 3 variables.			
9. Mathematical Modelling	• Application of mathematical modelling to situations that relate to the topics covered above.			