Topic 6: Automated and Emerging Technologies

Keyword sheet - Cambridge IGCSE Computer Science 0984. Tick each term once you can define it from memory.

Keyword	Definition	Know it?
Automated system	A system that carries out processes with little or no human intervention, typically using sensors, a processor and actuators.	
Sensor	Device that measures a physical property and sends data to a processor.	
Microprocessor	Processes sensor input according to a program and makes decisions to control outputs.	
Actuator	Output device that converts a signal into physical movement or action, e.g. a motor or valve.	
Feedback	Output of a system is used as input to adjust subsequent operation.	
Robot	A programmable machine with a mechanical structure, sensors and a processor that can carry out tasks automatically.	
Robotics advantages	Work continuously, accurately and in dangerous environments; can reduce long-term costs.	
Robotics disadvantages	High initial cost; job losses; cannot easily adapt to unexpected situations; need maintenance.	
Artificial intelligence (AI)	Computer systems able to perform tasks normally requiring human intelligence, such as learning, reasoning and perception.	
Expert system	AI program that mimics a human expert in a narrow field using a knowledge base, rule base and inference engine.	
Knowledge base	Store of facts about a particular subject held by an expert system.	
Rule base	Set of IF-THEN rules used by an expert system to reach conclusions.	
Inference engine	Component of an expert system that applies the rules to the knowledge base to produce a conclusion.	
Machine learning	AI technique where a system improves its performance by learning patterns from data rather than being explicitly programmed.	
Training data	Dataset used to teach a machine learning model.	
Autonomous vehicle	Vehicle that uses sensors and AI to navigate and operate without a human driver.	
Ethical issue	Moral concern raised by technology, e.g. job losses, bias in AI, privacy, accountability for decisions.	