

**1.5.2**  
**ETHICAL,**  
**MORAL**  
**AND CULTURAL ISSUES**  
**TOPIC WISE EXAM QUESTIONS**

**ANSWERS**

**A-LEVEL**

**OCR**

4		<p><b>Mark Band 3–High Level (7-9 marks)</b> The candidate demonstrates a thorough knowledge and understanding of artificial intelligence, machine learning and how biases can be inherited. The material is generally accurate and detailed.</p> <p>The candidate is able to apply their knowledge and understanding directly and consistently to the context provided. Evidence/examples will be explicitly relevant to the explanation.</p> <p>The candidate provides a thorough discussion which is well balanced. Evaluative comments are consistently relevant and well-considered.</p> <p>There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated.</p> <p><b>Mark Band 2-Mid Level (4-6 marks)</b> The candidate demonstrates reasonable knowledge and understanding of artificial intelligence, machine learning and/or how biases can be inherited; the material is generally accurate but at times underdeveloped.</p> <p>The candidate is able to apply their knowledge and understanding directly to the context provided although one or two opportunities are missed. Evidence/examples are for the most part implicitly relevant to the explanation.</p>	9	<p><b>AO1</b> Artificial intelligence is used for computer systems that are required to perform tasks that normally require human intelligence. AI is generally programmed. Machine learning is where a machine improves its performance/output through experience/access to data. Machine learning is a subset of AI.</p> <p><b>AO2</b> AI follows programming so if a program contains biases then so will the AI outcomes. Programmers must be aware of this and tackle it during design/implementation/testing. Machine learning bias depends on data given. Larger data sets are generally more inclusive/less biased but must be aware of data that is itself biased. Candidates may give examples that meet this.</p> <p><b>AO3</b> Thorough testing, multiple programmers and scrutiny of data sets are essential to ensure that unconscious biases are not inherited. If not thoroughly considered then biases will certainly be inherited. Datasets for machine learning need to be large enough to be representative but not so large that data is not able to be checked.</p>
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### AS - Level

3	(c)	<p><b>Mark Band 3–High Level (7-9 marks)</b> The candidate has weighed up benefits and drawbacks of the technology and has applied the moral, legal and ethical issues to both the customer and the business; the material is generally accurate and detailed. The candidate is able to apply their knowledge and understanding directly and consistently to the context provided. Evidence/examples will be explicitly relevant to the explanation. The candidate will have come to a fully justified conclusion.</p> <p><i>There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated.</i></p> <p><b>Mark Band 2-Mid Level (4-6 marks)</b> The candidate has weighed up benefits and drawbacks of the technology. They will have explored some of the moral, legal and ethical issues but they may not be equally spread across both the customer and the business; the material is generally accurate but at times underdeveloped. The candidate is able to apply their knowledge and understanding directly to the context provided although one or two opportunities are missed. Evidence/examples are for the most part implicitly relevant to the explanation. The candidate will have come to a conclusion although</p>	<p>AO1.1 (2) AO1.2 (2) AO2.1 (2) AO3.3 (3)</p>	<p><b>Knowledge:</b></p> <p><b>Benefits</b></p> <p>Customer:</p> <ul style="list-style-type: none"> <li>Personalised offers</li> </ul> <p>Business:</p> <ul style="list-style-type: none"> <li>Targeted adverts</li> <li>Able to track movement habits of customers</li> <li>Provide more personalised shopping experiences.</li> </ul> <p><b>Drawbacks</b></p> <p>Customer:</p> <ul style="list-style-type: none"> <li>Personal intrusion</li> <li>Invasion of privacy</li> <li>Pressured selling</li> </ul> <p>Business:</p> <ul style="list-style-type: none"> <li>Cost of infra structure</li> <li>Viewed as invading personal privacy</li> </ul> <p><b>Moral and Ethical issues</b></p> <ul style="list-style-type: none"> <li>Violation of civil liberties</li> <li>Recording people on the street who are not going into the shop</li> </ul> <p><b>Legal issues:</b></p> <ul style="list-style-type: none"> <li>under data protection laws the shop would need to             <ul style="list-style-type: none"> <li>Keep any data recorded secure</li> <li>Personal data should be accurate and up to date</li> </ul> </li> </ul> <p><b>Application:</b></p> <p><b>Benefits</b></p> <p>Customer:</p>
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			<ul style="list-style-type: none"> <li>Improved reputation through use of modern technologies may attract more customers</li> </ul> <p><b>Drawbacks:</b></p> <ul style="list-style-type: none"> <li>Loss of customer base due to customers unhappy with "pushy techniques"</li> <li>Poor public opinion from invasive advertising puts new customers off.</li> </ul>

5	<p><b>Mark Band 3–High Level (7-9 marks)</b> The candidate demonstrates a thorough knowledge and understanding of electronic communication monitoring techniques and the social and legal impact of this. The material is generally accurate and detailed.</p> <p>The candidate is able to apply their knowledge and understanding directly and consistently to the context provided. Evidence/examples will be explicitly relevant to the explanation.</p> <p>The candidate provides a thorough discussion which is well balanced. Evaluative comments are consistently relevant and well-considered.</p> <p>There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated.</p> <p><b>Mark Band 2-Mid Level (4-6 marks)</b> The candidate demonstrates reasonable knowledge and understanding electronic communication monitoring techniques and the social and legal impact of this; the material is generally accurate but at times underdeveloped.</p> <p>The candidate is able to apply their knowledge and understanding directly to the context provided although one or two opportunities are missed. Evidence/examples are for the most part implicitly relevant to the explanation.</p> <p>The candidate provides a sound discussion, the majority of which is focused. Evaluative comments are for the most part appropriate, although one or two opportunities for development are missed.</p>	9	<p><b>AO1</b> Encryption means that data is scrambled so that if it is intercepted, it cannot be understood. Requires the use of a key to decrypt. Symmetric encryption uses on key for encrypt/decrypt and so key exchange is problematic. Asymmetric encryption uses different keys (public and private) so no need to exchange keys. Regulation of Investigatory Powers Act (RIPA) gives authorities the power to compel disclosure of encryption keys</p> <p><b>AO2</b> Encrypted messages cannot be read by outsiders without the key RIPA gives Police the power to insist on users decrypting messages / handing over the key to allow reading of messages. Many messaging services already include end-to-end encryption by default Use of VPNs to re-route traffic and attempt to escape monitoring possible The ending of encrypted data shows that two parties are passing information they want to keep secret. Techniques like steganography can be used to his the existence of encrypted data.</p> <p><b>AO3</b> Monitoring communication runs the risk of revealing secret but non-illegal communications Restricting encryption means that secure sites (eg banks) may struggle to function Legislation (RIPA) already ensures that communications can be monitored if there is just cause Routine monitoring runs the risk of false-positives However, will reduce risk of illegal activities being co-ordinated (e.g. terrorism, drug trafficking).</p>
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8	<p><b>Mark Band 3—High Level (7-9 marks)</b> The candidate demonstrates a thorough knowledge and understanding issues around computers and the workforce and Artificial Intelligence. The material is generally accurate and detailed.</p> <p>The candidate is able to apply their knowledge and understanding directly and consistently to the context provided. Evidence/examples will be explicitly relevant to the explanation.</p> <p>The candidate provides a thorough discussion which is well balanced. Evaluative comments are consistently relevant and well-considered.</p> <p>There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated.</p> <p><b>Mark Band 2—Mid Level (4-6 marks)</b> The candidate demonstrates reasonable</p>	<p>AO1.1 (2)</p> <p>AO1.2 (2)</p> <p>AO2.1 (2)</p> <p>AO3.3 (3)</p> <p>9</p>	<p>Points may include but aren't limited to:</p> <p><b>AO1 Knowledge and Understanding</b></p> <p>Artificial Intelligence (AI) is the study of computers displaying intelligent behaviour (usually characterised by decision making).</p> <p>AI techniques include neural networks, evolutionary computation, Bayesian networks etc.</p> <p>Computers are well suited to certain jobs and as AI techniques improve the range of jobs they can do is likely to increase.</p> <p><b>AO2.1 Application</b></p> <p><b>For the argument:</b></p> <p>Many jobs have already been taken over by computers.</p> <p>Manual job such as work in the automotive industry has been replaced by robots.</p>
	<p>knowledge and understanding issues around computers and the workforce and Artificial Intelligence; the material is generally accurate but at times underdeveloped.</p> <p>The candidate is able to apply their knowledge and understanding directly to the context provided although one or two opportunities are missed. Evidence/examples are for the most part implicitly relevant to the explanation.</p> <p>The candidate provides a sound discussion, the majority of which is focused. Evaluative comments are for the most part appropriate, although one or two opportunities for development are missed.</p> <p>There is a line of reasoning presented with some structure. The information presented is in the most part relevant and supported by some evidence.</p> <p><b>Mark Band 1—Low Level (1-3 marks)</b> The candidate demonstrates a basic knowledge around computers and the workforce and Artificial Intelligence.; the material is basic and contains some inaccuracies. The candidate makes a limited attempt to apply acquired knowledge and understanding to the context provided.</p> <p>The candidate provides a limited discussion which is narrow in focus. Judgments if made are weak and unsubstantiated. The information is basic and communicated in an unstructured way. The information is supported by limited evidence and the relationship to the evidence may not be clear.</p> <p><b>0 marks</b> No attempt to answer the question or response is not</p>		<p>Computer based systems are attractive to employers, they don't require paying, don't get sick and can work 24/7 without making mistakes.</p> <p>Computer systems can be used for work that is considered dangerous for humans</p> <p>And for repetitive and menial tasks.</p> <p>Future developments may make computers better at highly skilled tasks making computers preferable</p> <p>And in the case of certain tasks (e.g. surgery) would make the use of human workers unethical.</p> <p>May cite recent developments in AI (e.g. beating world Go Champion)</p> <p><b>Against the argument:</b></p> <p>As technology develops people will be required to design these new systems.</p> <p>It is likely to assist but not take over all roles</p> <p>Producing a more skilled workforce</p> <p>Developments in AI have been forecast for many decades but never materialised.</p> <p>Forecasts as to the development of AI have always been wildly optimistic</p> <p>There is debate as to whether AI will ever be able to show human levels of intelligence.</p> <p>Tasks that humans find inherently 'easy' are still beyond the reach of computers.</p> <p>Crucially for many areas of work computers will have to pass the Turing Test – i.e. converse to such a level that will enable them to pass as</p>
	<p>worthy of credit.</p>		<p>human...</p> <p>...Most believe this is still well beyond our current understanding.</p> <p>Laws would need changing as currently people have the right to have automated decisions checked over by humans (DPA)</p> <p><b>AO3.3 Evaluation</b></p> <p>Candidate should have come to a well reasoned conclusion for or against the argument. They could come down on either side, the important thing is they have considered both points of view and based their conclusion on the evidence they have discussed.</p>

**If you found this  
useful, drop a follow  
to help me out!**

**THANK YOU!**

**GCST**