



## Codefez Systems Architecture, Memory & Storage Worksheet 2 Answers

Q	Answer	Mark	Guidance																				
1	1 mark for any of the following: <ul style="list-style-type: none"><li>- To store instructions / data that is frequently used / previously used / next to be used</li><li>- Data does not need to be fetched from RAM</li><li>- Cache memory is closer to the CPU and as a result <b>access is faster</b></li></ul>	3																					
2	1 mark for any of the following: <ul style="list-style-type: none"><li>- To store personal files of the user</li><li>- To store operating system and user software</li><li>- Non-volatile storage that is persistent once the PC is turned off.</li></ul>	2																					
3	RAM stores currently running data and instructions	1																					
4	1 mark for each correct tick <table border="1"><tr><td>Storage</td><td>Volatile</td><td>Non-volatile</td><td>Read only</td><td>Writeable</td></tr><tr><td>RAM</td><td>✓</td><td></td><td></td><td>✓</td></tr><tr><td>ROM</td><td></td><td>✓</td><td>✓</td><td></td></tr><tr><td>SSD</td><td></td><td>✓</td><td></td><td>✓</td></tr></table>	Storage	Volatile	Non-volatile	Read only	Writeable	RAM	✓			✓	ROM		✓	✓		SSD		✓		✓	6	Do not award any marks in a row where there are more than 2 ticks.
Storage	Volatile	Non-volatile	Read only	Writeable																			
RAM	✓			✓																			
ROM		✓	✓																				
SSD		✓		✓																			
5	1 mark for each correct tick: <table border="1"><tr><td>Event</td><td>Not True (place a ✓)</td></tr><tr><td>An instruction is fetched from memory</td><td></td></tr><tr><td>The instruction is then decoded</td><td></td></tr><tr><td>The decoded instruction is then executed</td><td></td></tr><tr><td>The process is repeated 3 times</td><td>✓</td></tr><tr><td>The program counter is incremented</td><td></td></tr><tr><td>The instruction is transferred to the MDR</td><td></td></tr><tr><td>The address of the instruction to be fetched is placed in the MAR</td><td></td></tr><tr><td>The instruction is transferred to the program counter</td><td>✓</td></tr></table>	Event	Not True (place a ✓)	An instruction is fetched from memory		The instruction is then decoded		The decoded instruction is then executed		The process is repeated 3 times	✓	The program counter is incremented		The instruction is transferred to the MDR		The address of the instruction to be fetched is placed in the MAR		The instruction is transferred to the program counter	✓	2	Do not accept cloud storage in this case		
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6	<p>1 mark for each correct suggestion (up to 4 marks)</p> <p>Considerations for secondary storage devices may include:</p> <ul style="list-style-type: none"> <li>- Capacity/size</li> <li>- Speed</li> <li>- Portability</li> <li>- Durability</li> <li>- Reliability</li> <li>- Cost</li> </ul>	4	
7	<p>Eg. 1 mark for any of the following:</p> <ul style="list-style-type: none"> <li>- More instructions can be stored in cache</li> <li>- ... thereby reducing the need to fetch instructions from the RAM</li> <li>- Cache memory is faster than RAM</li> <li>- ... instructions stored there can result in faster retrieval of instructions.</li> </ul>	2	
8	<p>Eg. 1 mark for any of the following:</p> <ul style="list-style-type: none"> <li>- A system where instructions are stored in memory</li> <li>- Data and instructions are stored in the same memory</li> </ul>	2	

