

Q23

a) A custom-designed solution will be far more expensive than a customised off-the-shelf package (COTS), but will do everything that the company wants. As the company is small, cost may be an important issue.

A COTS package, such as Excel, may be able to perform the tasks required, but the company will have no say into the style and interface of the COTS package. Both ~~the~~ programs <sup>are</sup> ~~are~~ generally well supported, but the custom solution may be supported better, as the COTS package could come from overseas, and <sup>detailed</sup> ~~very~~ support expensive, and difficult to get.

As the task is small, and common among companies who store data, a COTS package is a faster alternative than a custom solution, as the program can be obtained by buying from a shop and then installing. A custom solution will be much slower to achieve the solution.

b) i) The most significant development has been the creation of the internet, in both hardware in terms of servers and networks, and software in terms of browsers, email and chat and FTP programs.

The internet caters for anyone, anywhere around the world, and downloads, such as of an open-source program can be made without cost, suiting open-source. Hardware ~~and~~ developments also include faster computers, modems, and satellites, which all enhance communication. ~~and~~ Software developments include chat programs & file-sharing programs. ~~and~~ These aspects have made open-source possible - such as the ~~the~~ <sup>\*nix</sup> movement. ~~WAAAAA~~

ii) Management of opensource could be difficult. Issues ~~the~~ such as the fact that anyone can add anything to the program very easily, <sup>causing</sup> ~~causes~~ software to change rapidly, and often without knowledge of others. This may be remedied by having all software changes being coordinated at a single, or very <sup>limited</sup> ~~few~~ locations. Another issue is that software that has been added to or altered

may be able to be sold without other developers knowing, or used in other programs. Another issue is that one problem may be solved one hundred different ways, and each developer believing their solution is the best. ~~Creating~~ <sup>Creating</sup> headaches for management.

(i) Register 3 is being used as an accumulator

ii) A1. It is in hexadecimal format as the register may only be able to store hex. values

iii) Reg 3 - Mem 6  $30 + A1$

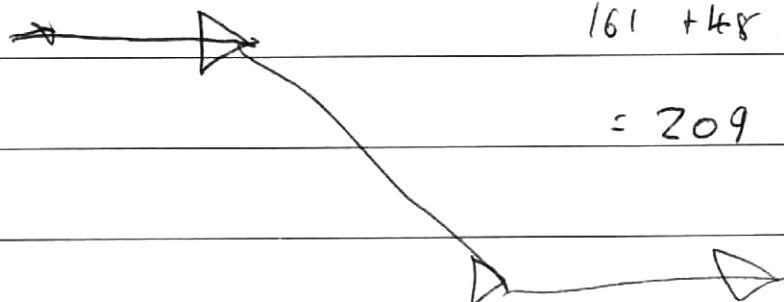
$$\text{Mem 6} = A1 \qquad 30$$

$$= 1010\ 0001 \qquad = 0011\ 0000$$

$$= \begin{array}{r} 1 + \\ 32 \\ 128 \\ \hline \end{array} \qquad = \begin{array}{r} 16 + \\ 32 \\ \hline 48_{10} \end{array}$$

$$= 161_{16}$$

iv)



(iv) Address Contents

~~Mem 4 05~~

Mem 5 30

... ..

~~LOAD (Reg 1, Mem 5)~~

~~LOAD (Reg 2, Mem 4)~~

~~ADD~~

~~MULTIPLY (Reg 3, Reg 1, Reg 2)~~

LOAD (Reg 1, Mem 5)

ADD (Reg 2, Reg 1, Reg 1)

ADD (Reg 3, Reg 2, Reg 1)

STORE (Reg 3, Mem 7)