

## Question 27

a) 1) Computer Aided Design (CAD)

is where people use computers in the design of a product, house etc. Through computer Aided Design, drawings and designs can be made more accurate i.e. straighter lines, correct angles etc. Architects these days are using CAD to help them in the drawing and design of houses and products, the software available not only helps the architect with the creation, but in the client in viewing. 3D images of the design can be rendered and a fly through ~~created~~ created - this is where the 3D model of the house can be looked at from any angle and the client can "fly" through the house. ~~Even~~ CAD is the assistance by a computer in the drawing or design of a product or house etc. However as seen through the example it also helps others in viewing the design and understanding what has been created.



11) 2) One actuator is a motor. A motor in its simplest form is constructed by a rod that has coiled insulated copper wire wrapped around it. This rod is surrounded by two magnets of opposite sign (+, -) and when an electric current is passed through it, it spins around in proportion to the electric current.

Motors like this can be used in and Automated manufacturing system in the movement of a conveyor belt to move something along a production line. They can also be used in the movement of an arm in turning around etc

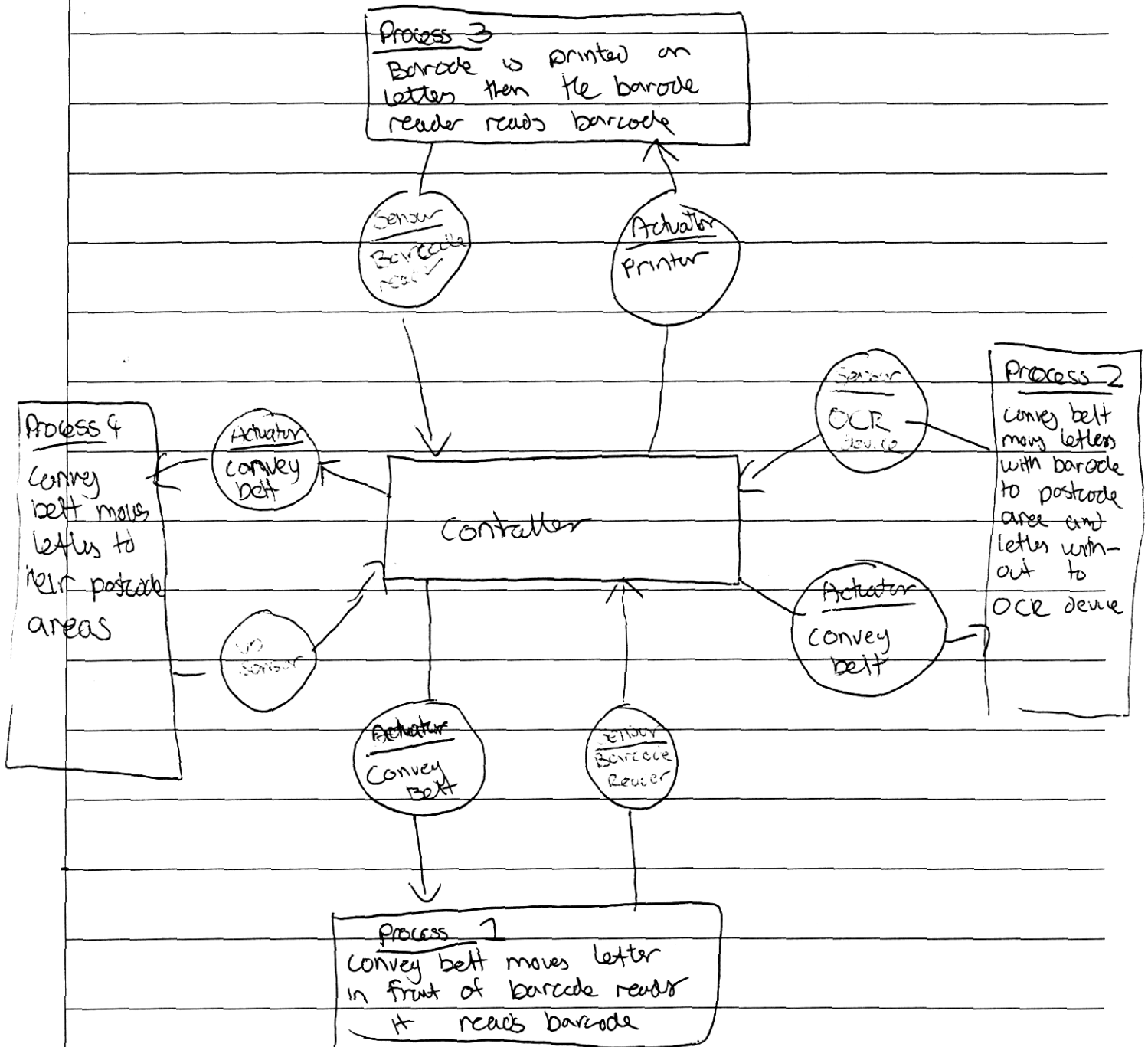
2) Another actuator is a hydraulic arm. This consists of an arm that is driven by hydraulics. - There is a master cylinder and a slave cylinder and the size ratio between them is proportional to the power ratio. There is a piston at either end and when the piston of



The master cylinder is pushed in - through the movement of oil through a cable a piston is pushed out the slave cylinder. Through this great power can be achieved with little force. Hydraulic arms are used in Automated manufacturing systems in lifting heavy materials, in carrying out quick and precise movement, in the handling of hazardous materials. For example hydraulic arms are used in the spray painting of cars, where the ~~things~~ fumes are hazardous to people and the work is done quicker and better than what humans can do.

b)

Block diagram on next page



The block diagram has four processes from 1 to 4. The process Actuators used are printer and convey belt, the sensors used are Barcode Reader and OCR device. Process 4 does not have a sensor because the process is finished.

ii) The disadvantages of using barcodes in commercial applications such as mail sorting is that with barcodes ~~you~~ you need barcode readers and they ~~also~~ eliminate jobs for people mail sorting. Barcodes also make it a computer centred system, not a human centred system as only computers can read barcodes. This can lead to job dissatisfaction for humans in the work. Through the printing of barcodes on the front of people's letters it takes away the personal touch. Also some letters might have writing where the barcode is printed and for this there might be problems reading it. It is also expensive to implement.

The advantages of barcodes is that it makes the job a lot ~~quicker~~ quicker and for this, mail is sent faster. It also takes away the tedious job of mail sorting away from humans. The running of barcodes system is cheaper to run in the

long term. Preprinted barcodes are also more accurate and there is less probability Barcode reading is faster and more reliable and when hooked up to a DB can work a lot more efficient

c) Collecting of information would mainly be through the use of barcode scans to scan all fashion items. However through the movement of items from storage to dispatch light sensors can count how many items go passed a point on a conveyor belt. Photoelectric cells which use external cyclon to turn light into electric current can sense when a object passes in front of it. This can be hooked up to a computer and from this it can tell how many items are getting moved from storage to dispatch. These items can also be double checked through barcode readers and the results can be

compared to lost accuracy. - This can further be compared to the number of items that have been ordered. Once this information is collected it can be processed. Barcode readers send light and dark stripes which each represent a number, this number is matched up with stock information in the Database. Light sensors just count the number of stock passing through a point. This is processed to give a number and compared with the results. The computer then processes the information, it has to minus the number of items moved from storage to dispatch from items in stock to update the database. This information can then be displayed on either a monitor or printed out as a report on paper. The information can be processed into a report format to give relevant information to the managers.