21.

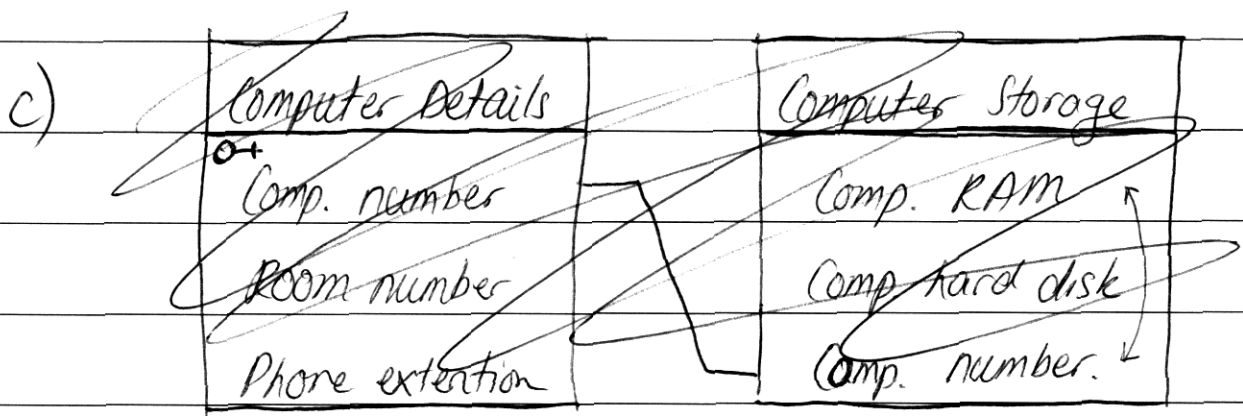a) A server is a piece of hardware that is given a specific task on a network, ie to manage applications/data of a particular kind. Specifically a file server stores and manages the files used within the network. It allows other nodes to access these files when necessary for processing or other tasks. By holding all files in one place this can save valuable space on the memory of other nodes. It is also safer from possible hackers and keeps data accurate by storing the main file in one place than many.

b) Data redundancy is the unnecessary duplication of data within a database. Here location is redundant data as it can be interpreted by using the room number.

The entrys in 'Location' are often long - such as 'Managers Office', thus they use extra bits and therefore memory to store this information. As the database increases in size the 'Location'

field will use up more and more valuable storage space. Similarly if queries are run on the data, the more data in the database there is to search, the more time it will take to finish the search. The database may also take longer to open or save with this amount of redundant data.

c)

Computer Details	Computer Storage
Comp. number	Comp. RAM
Room number	Comp. hard disk
Phone extention	Comp. number.

PTO

c)

primary key →

Computer details				Computer Storage		
Comp. no.	Phone ex.	room no.	foreign key →	Comp. no	Comp RAM	Comp. H.D
001	3227	9023		001	64	6
002	3227	9023		002	64	10
003	1859	9115		003	128	8
004	1859	9115		004	96	8
005	2016	9153		005	256	40