exam collection

(I) July 2006

? 1 a) two sides of requirement analysis:

1) requirement discovery
2) requirement flowdown.

* b) ~~requirements on requirements: 1) safety/regulations~~

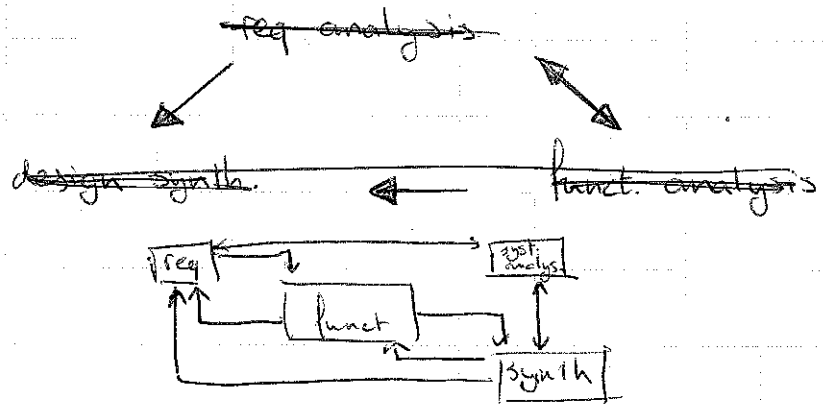
~~2) budget (available)~~ 1) unique identifier

~~3) time available.~~ 2) each sentence includes only 1 req.

~~4)~~ 3) requirement shall be verifiable.

4) does not include the reason.

c)



d) customer reqs. refer to the demands and needs of the customer. Product requirements refer to the restrictions laid upon the product both from regulations (outside) and from the company itself (inside).

e) customer req: 1) quiet
2) clean (environmentally friendly)
3) cheap (low operating costs)
4) fast

product reqs. 1) safe (regulations).
2) cheap (development and operations).
3) must be developable within time limits.
4) producable largely using 'old' facilities.

f) 1)- Requirement discovery tree → (AND-tree)
basic guideline is to split requirements into two parts every time.

2) Quality Function Deployment (QFD)
→ used to steer customer demands into demands of your product. It can also be used to translate reqs. to solutions.

2 a) 1) individual 3) corporate
2) groupwise 4) governmental.

b) military - 1) reconaissance over uncertain or enemy terratory
2) remotely controlled fighting (armed UAV's).
civil 3) reconaissance over difficulty accessible area's.

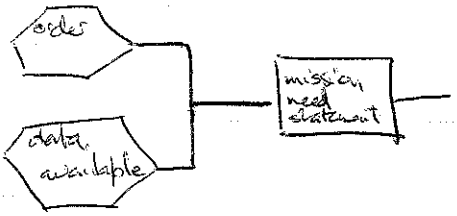
c) • primary demand : demand for the final product.
• derived demand : demand for parts / recources → demand of these goods depends on the demand of the final product.

d) 1) airbus A380
2) RR engine.
1) Ariane 5 launcher.
2) Galileo satellite.

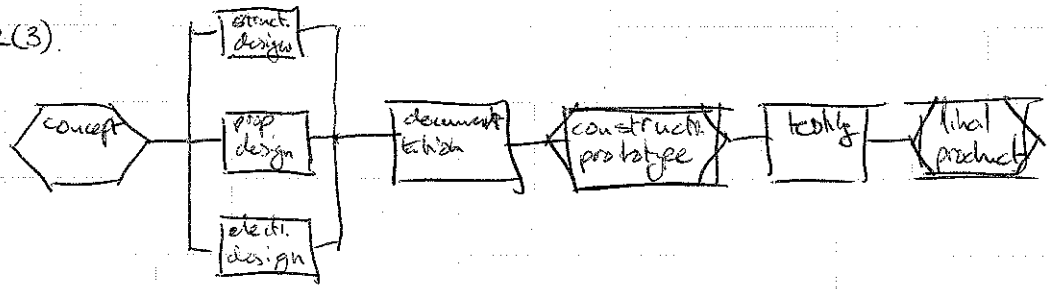
e) Since often there are parallel processes as well as interactions between multiple elements of the supply 'chain'. Therefore the chain is better called 'tree' or 'network'

→ 3 a)

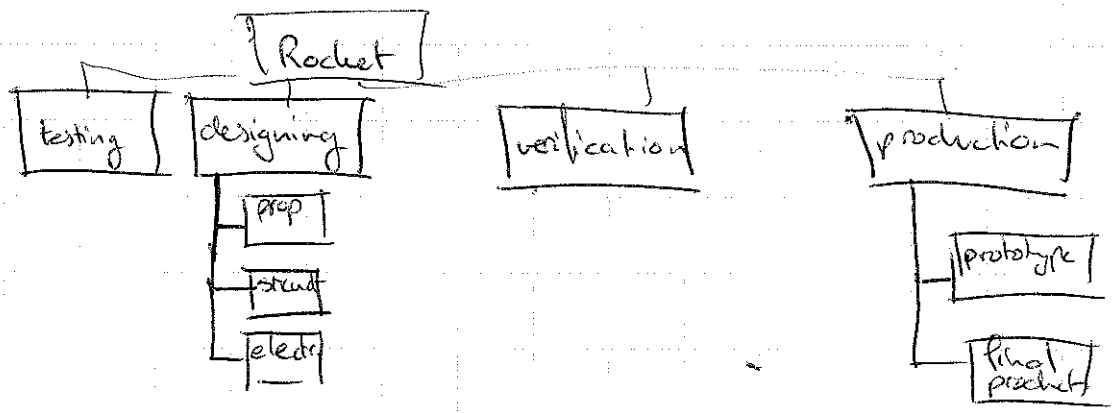
phase (1)



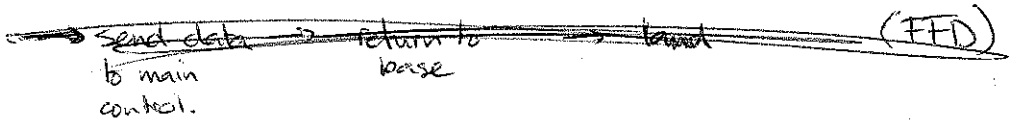
phase (3)



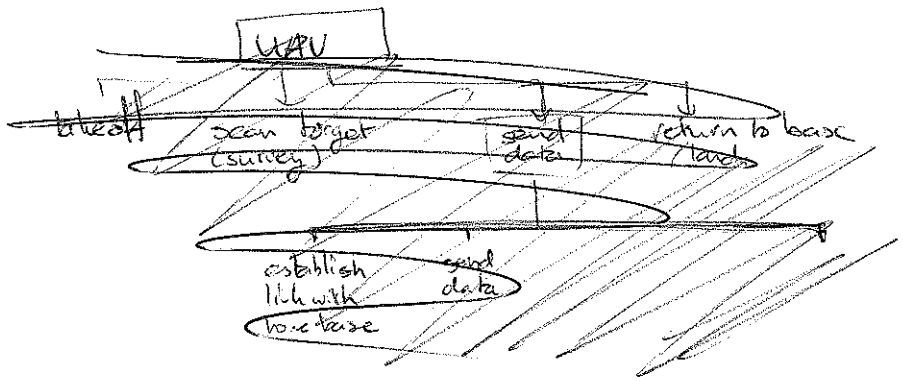
b) wbs of design. phase (3).



4 a) (i)

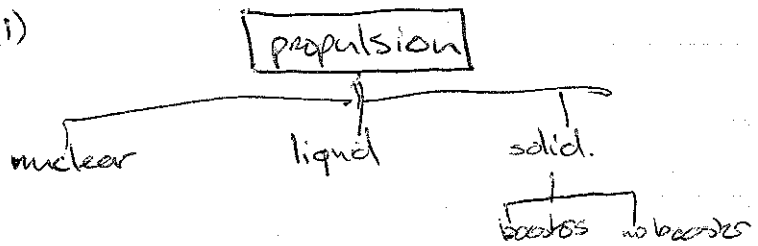


(II)

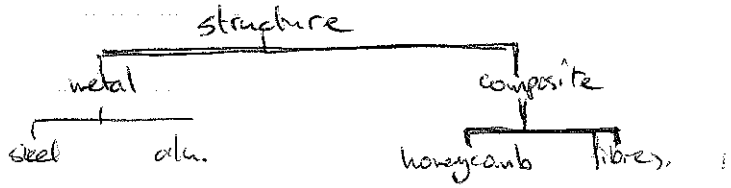


c) design option tree

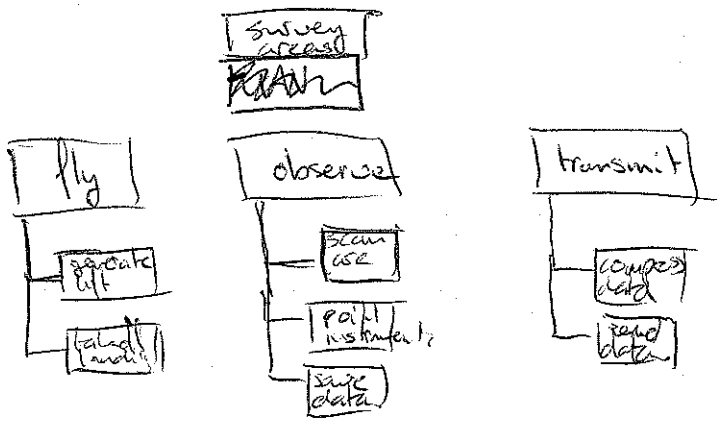
(i)



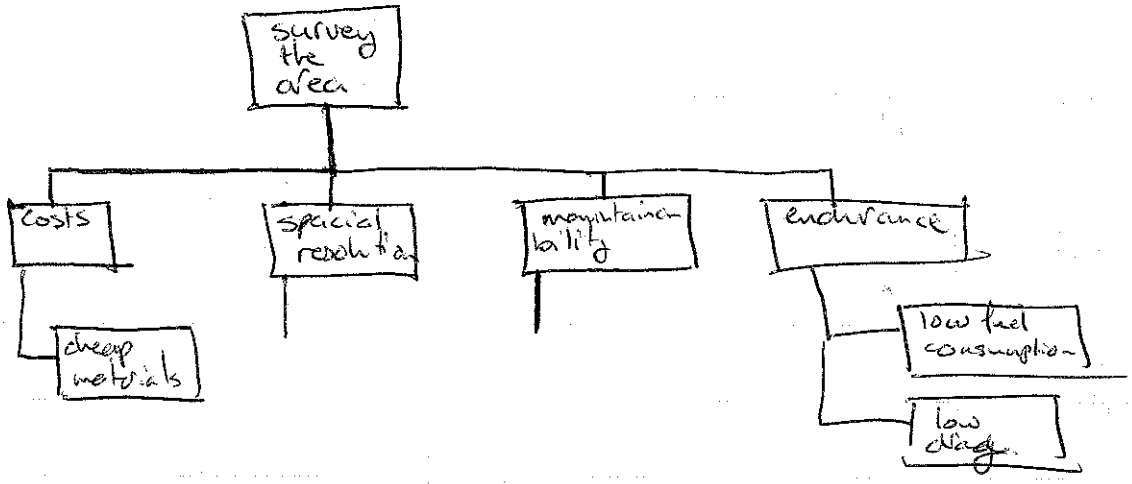
(ii)



1 a)

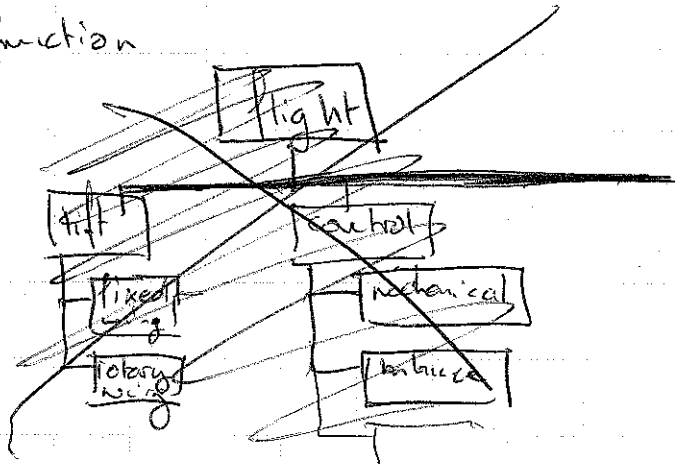


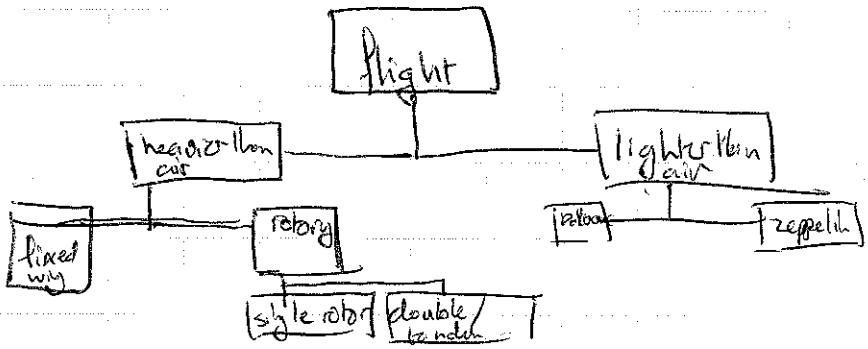
b) requirement discovery tree.



requirements oppose make sure the functions are performed.

c) design option trees for 3 most important function





4 d) perform a tradeoff

criteria - endurance
coverage

	endurance		coverage		$
	6		4		
conventional wing	4	24	7	28	52.
~~rotary~~	3	18	8	32	50
zeppelin	8	48	7	28	76
hot balloon.	9	53	5	20	73.

5 a) -

b) constant failure rate = exponential.

1) failure density function: $(\theta = \lambda^{-1})$.

$$f(t) = \frac{1}{\theta} e^{-t/\theta}$$

$$R(t) = \int_t^\infty \frac{1}{\theta} e^{-\frac{t}{\theta}} dt = 0,9 \quad = e^{-t/\theta}$$

$$-t = \theta \ln 0,9$$

$$t = -\theta \cdot \ln(0,9)$$

2) $1 - (1-R)^2 = 0,9$

6 a) ~~review of design~~ - ~~reconsider the design process~~
~~→ double check the everything~~

review of design - check by inspection of design documentation to see if the product meets requirements.

inspection - inspect objects on production errors.

analysis - FEM, etc

testing - test the actual model.

c) acceptance testing - testing on actual product
→ do not destroy product

qualification testing - testing above normal loads.
(prototype) (might be destructive).

d)