System Analysis & Design

Quiz 1

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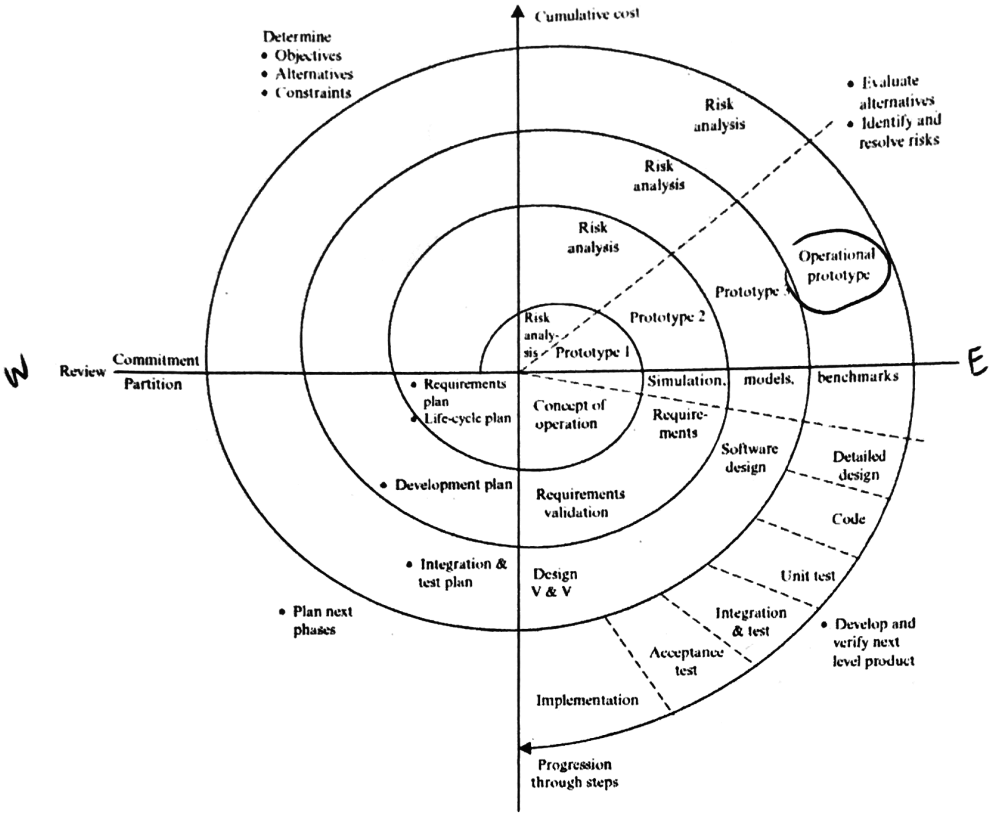
1. Compare and contrast three paradigms and describe their designs in terms of diagram. 5%
2. Compare and contrast extreme programming and throwaway prototyping and draw their diagrams. 5%
3. Which phase in the SDLC is most important and what is it related to V&V? 4%
4. Suppose you were to combine throwaway prototyping with the use of waterfall development. What would the methodology look like? Draw a diagram and describe it. 5%
5. Suppose you are an analyst working for a big company to develop an executive system. The system is not big, while it needs an innovative display to summarize and drill down key facts in a quick way. It is highly required for its reliability and a short time schedule with schedule visibility. What type of methodology would you use to design, and why? 3%
6. Suppose you are an analyst developing a new information system to automate the sales transactions and manage inventory for each retail store in a large chain. The system would be installed at each store and exchange data with a mainframe computer at the company's head office. What type of methodology would you use to design and why? 3%
7. How can we apply the 80-20 principle to system design? 3%
8. Given the following diagram, please answer the following questions of risk management. 5%



The development process looks like a spiral. Each cycle of the spiral is aimed at enhancing a certain aspect of the system under development. Each cycle of the spiral selectively executes some of the following steps:

1) NW-Determine the objectives, alternatives, and constrains for the current cycle. What will be identified and prioritized in this this step?
2) NE- Evaluate alternatives; identify and resolve risks. What will be identified in this step?
3) If there are remaining risks, then the subsequent steps would go to _____.
4) If the previous cycles have resolved the major known risks, then the subsequent steps could proceed to _____.
5) If the prototype produced during the previous rounds are operational and robust enough into a final system, then the prototype is a design prototype or system prototype?

9. Using the given information in the following Table, assuming that the project team will work a standard working week (5 working days in 1 week) and that all tasks will start as soon as possible. Please do the following: 1) Determine the critical path of the project and draw the PERT diagram **6%**, 2) Calculate

the planned duration of the project in days and weeks. **4%**

Task	Description	Duration (Working Days)	Predecessor/s
A	Requirement Analysis	5	
B	Systems Design	15	A
C	Programming	25	B
D	telecoms	15	B
E	Hardware Installation	30	B
F	Integration	10	C, D
G	System Testing	10	E, F
H	Training/Support	5	G
I	Handover and Go-Live	5	H

10. Suppose you are studying two hardware lease proposals. Option 1 costs $4,000 but requires that the entire amount be paid in advance. Option 2 costs $5,000, but the payments can be made $1,000 now and $1,000 per year for the next four years. If you do an NPV analysis assuming a 14 percent discount rate, which proposal is less expensive? What happens if you use an eight percent rate? **10%**

11. We are now going to estimate project effort. Given UAW=16, UUCW=100, TCF =0.75. Please complete the use-case point estimation as below.

Unadjusted Use Case Points (UUCP) = 84 **2%**

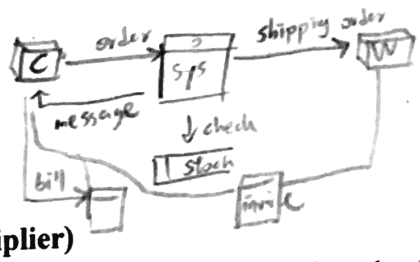
Environmental Factors

Factor Number	Description	Weight	Assigned Value (0-5)	Weighted Value
E1	Familiarity with system development process being used	1.5	5	7.5
E2	Application experience	0.5	2 ✓	1.0
E3	Object-oriented experience	1.0	5	5
E4	Lead analyst capability	0.5	5	2.5
E5	Motivation	1.0	5	5.0
E6	Requirements stability	2.0	5	10.0
E7	Part time staff	-1.0	4 ✓	-4.0
E8	Difficulty of programming language	-1.0	4 ✓	-4.0

Environmental Factor Value (EFactor) = 23

Environmental Factor (EF) = 1.4 + (-0.03 * EFactor)= 0.71 **2%**

Adjusted Use Case Points (UCP) = 54.75 **2%**



***PHM* (Person-hours multiplier)**

If the sum of (number of Efactors E1 through E6 assigned value < 3) and
(number of Efactors E7 and E8 assigned value > 3) <= 2

PHM = 20

Else If the sum of (number of Efactors E1 through E6 assigned value < 3) and
(number of Efactors E7 and E8 assigned value > 3) = 3 or 4

PHM = 28

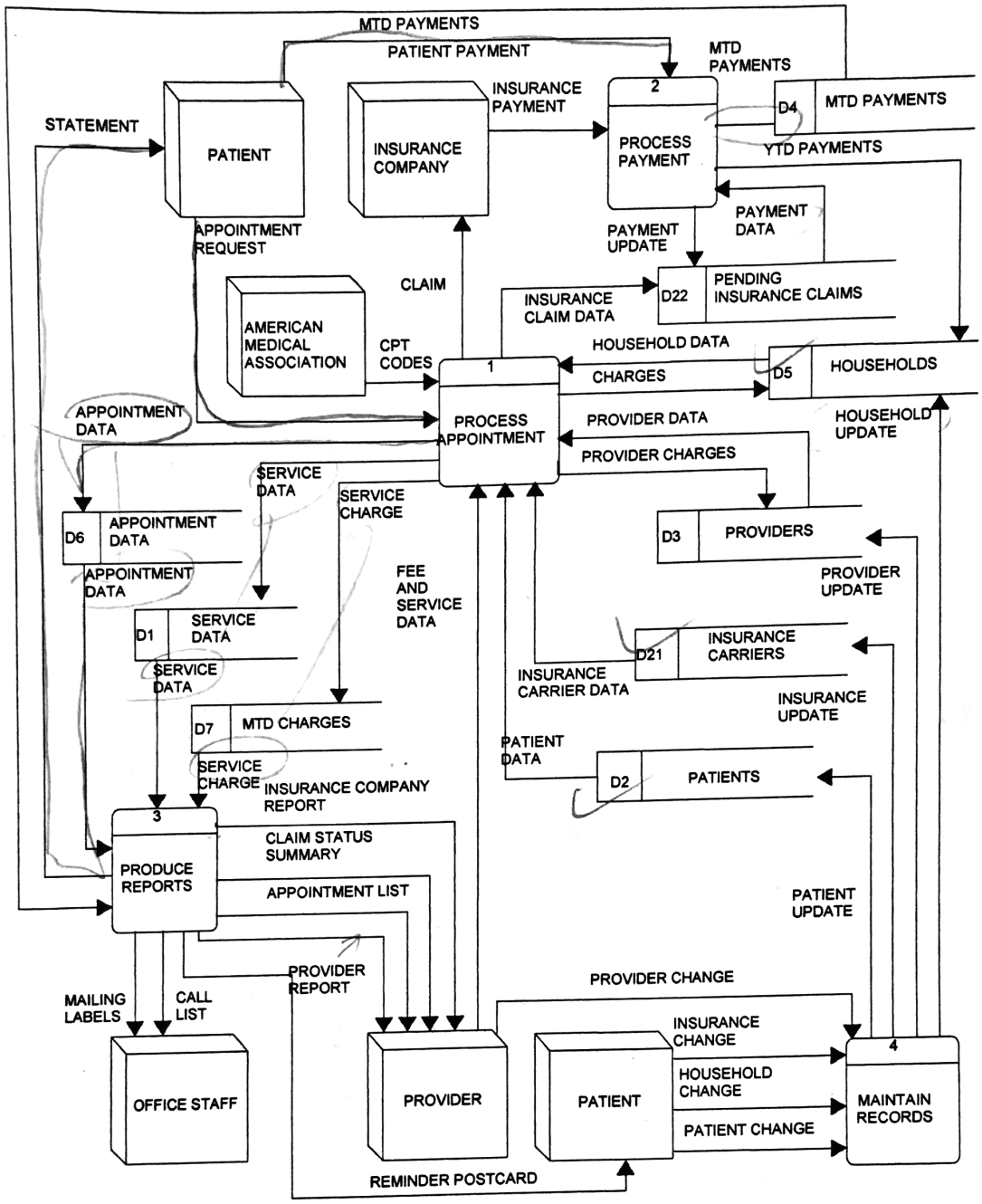
Else

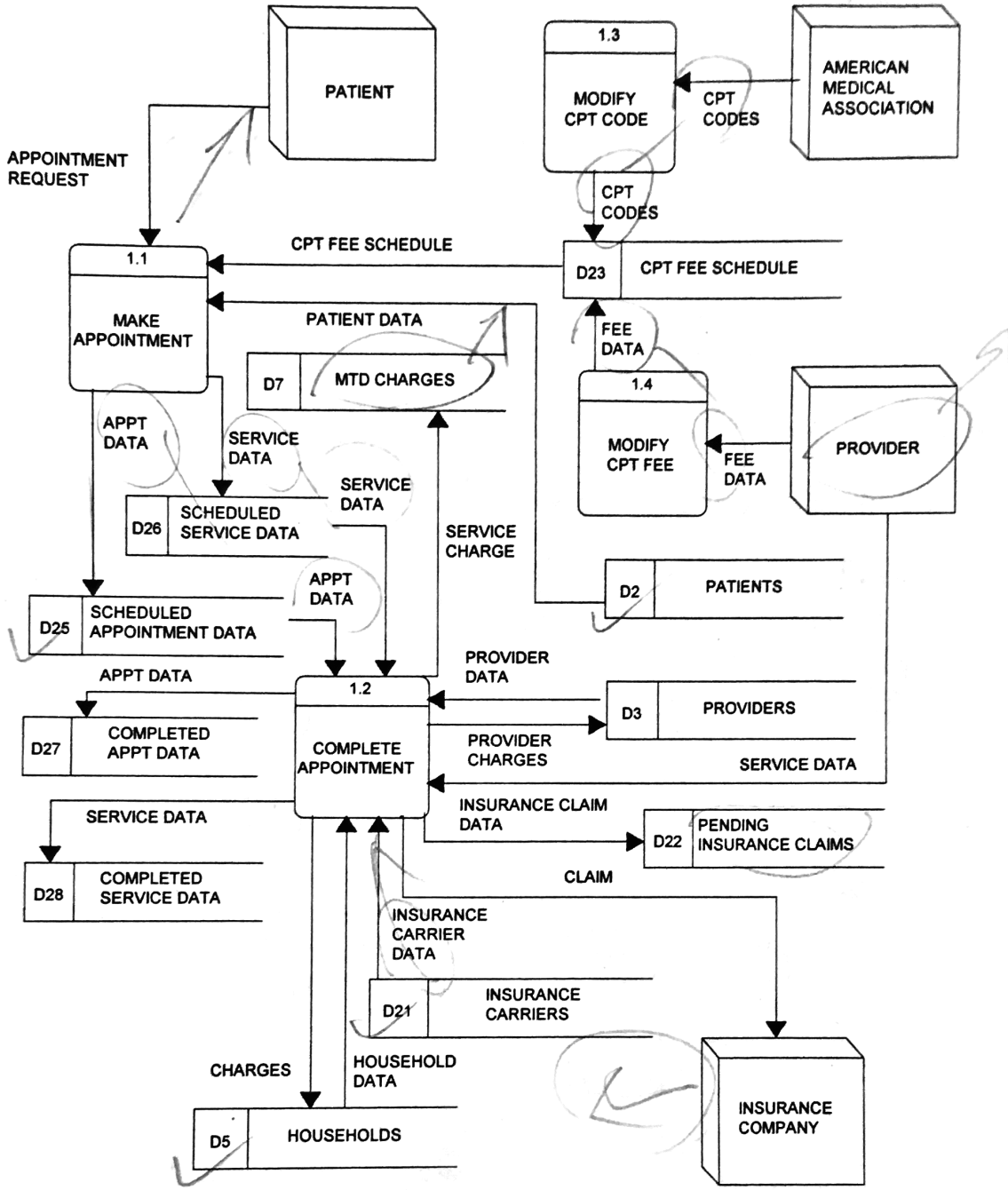
Rethink project; it has too high of a risk for failure

Effort in Personal Hours = 1519 **2%**

How many persons needed in this project if the ~~time to complete is 3 years~~? **2%**
Working hours of a month are 200, the time to complete in 6 month.

12. Explain the DFD leveling and balancing techniques. Which one displays detailed processes until they reach functional primitives. **3%**
13. Kitchen Gadgets sells a line of high-quality kitchen utensils and gadgets. When customers place orders on the company's Web, the system checks to see if the items are in stock, issues a status message to the customer, and generates a shipping order to the warehouse, which fills the order. When the order is shipped, the customer is billed. The system also produces various reports. Please draw a context diagram **5%** and a diagram 0 DFD for the order system. **10%**
14. City Bus Lines is developing an information system. The IT manager wants you to document a process that determines whether extra buses currently are needed on a particular route. The process automatically assigns additional buses to that route, but *only* if all other routes are operating on schedule. In this situation, a supervisor can override the automatic process if he or she so desires. Please do the following:
    1) Create a decision table that describes the bus transfer process. **10%**
    2) Simplify the table.
    3) Draw a decision tree that describes the bus transfer process.
15. Given the diagram 0 and diagram 1 of New Century Office System we discussed in the class as below. Please correct necessary errors. **5%** Please list the data elements required of the data stores including HOUSEHOLDS (D5), PATIENTS (D2), INSURANCE CARRIERS (~~D8~~), and SCHEDULED APPT DATA (D25) for the system. **8%**


MTD PAYMENTS
PATIENT PAYMENT
MTD PAYMENTS
STATEMENT
PATIENT
INSURANCE COMPANY
INSURANCE PAYMENT
2
PROCESS PAYMENT
D4
MTD PAYMENTS
YTD PAYMENTS
APPOINTMENT REQUEST
PAYMENT UPDATE
PAYMENT DATA
CLAIM
AMERICAN MEDICAL ASSOCIATION
CPT CODES
INSURANCE CLAIM DATA
D22
PENDING INSURANCE CLAIMS
HOUSEHOLD DATA
1
CHARGES
D5
HOUSEHOLDS
APPOINTMENT DATA
PROCESS APPOINTMENT
PROVIDER DATA
HOUSEHOLD UPDATE
PROVIDER CHARGES
SERVICE DATA
SERVICE CHARGE
D6
APPOINTMENT DATA
D3
PROVIDERS
APPOINTMENT DATA
PROVIDER UPDATE
FEE AND SERVICE DATA
D1
SERVICE DATA
D21
INSURANCE CARRIERS
SERVICE DATA
INSURANCE CARRIER DATA
INSURANCE UPDATE
D7
MTD CHARGES
PATIENT DATA
SERVICE CHARGE
INSURANCE COMPANY REPORT
D2
PATIENTS
3
CLAIM STATUS SUMMARY
PRODUCE REPORTS
APPOINTMENT LIST
PATIENT UPDATE
PROVIDER REPORT
PROVIDER CHANGE
MAILING LABELS
CALL LIST
INSURANCE CHANGE
4
OFFICE STAFF
PROVIDER
PATIENT
HOUSEHOLD CHANGE
MAINTAIN RECORDS
PATIENT CHANGE
REMINDER POSTCARD


PATIENT
1.3
MODIFY CPT CODE
CPT CODES
AMERICAN MEDICAL ASSOCIATION
APPOINTMENT REQUEST
CPT CODES
1.1
MAKE APPOINTMENT
CPT FEE SCHEDULE
D23
CPT FEE SCHEDULE
PATIENT DATA
FEE DATA
D7
MTD CHARGES
1.4
MODIFY CPT FEE
FEE DATA
PROVIDER
APPT DATA
SERVICE DATA
SERVICE DATA
D26
SCHEDULED SERVICE DATA
SERVICE CHARGE
D2
PATIENTS
APPT DATA
D25
SCHEDULED APPOINTMENT DATA
PROVIDER DATA
APPT DATA
1.2
COMPLETE APPOINTMENT
D3
PROVIDERS
D27
COMPLETED APPT DATA
PROVIDER CHARGES
SERVICE DATA
SERVICE DATA
INSURANCE CLAIM DATA
D22
PENDING INSURANCE CLAIMS
D28
COMPLETED SERVICE DATA
CLAIM
INSURANCE CARRIER DATA
D21
INSURANCE CARRIERS
CHARGES
HOUSEHOLD DATA
INSURANCE COMPANY
D5
HOUSEHOLDS