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UNIVERSITY OF TORONTO  
Scarborough College

**CSCC40 Analysis and Design of Information Systems  
mid-term test**

March 13, 2002 9-11 AM Room S361

Duration: 2 hours.

One 8 1/2 by 11 aid sheet is permitted.

**A.1**

[4]

Indicate with a ✓ which type of system best handles the type of process listed below

	operational/ transaction system	management support system	real-time control system
record-keeping in an organization	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
processing of routine business activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
data extraction and organization to answer questions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
control a physical operation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**[black = must select, white = must NOT select, grey = doesn't matter]**

**A.2**

In the value chain model, which are the primary activities and which are the supporting activities?

[4]

	primary	supporting
administration and infrastructure	<input type="checkbox"/>	<input type="checkbox"/>
human resources management	<input type="checkbox"/>	<input type="checkbox"/>
inbound logistics	<input type="checkbox"/>	<input type="checkbox"/>
information systems development	<input type="checkbox"/>	<input type="checkbox"/>
operations	<input type="checkbox"/>	<input type="checkbox"/>
outbound logistics	<input type="checkbox"/>	<input type="checkbox"/>
product and technology development	<input type="checkbox"/>	<input type="checkbox"/>
sales and marketing	<input type="checkbox"/>	<input type="checkbox"/>
services	<input type="checkbox"/>	<input type="checkbox"/>

**[black = must select, white = must NOT select, grey = doesn't matter  
see page 20 in text]**

**A.3** Give one consequence the system's users will face for each of the following design flaws.  
Do not repeat any consequence. I.e. don't state the same consequence twice.

[5]

design flaw	possible consequence for <b>any</b> system's users
screens are difficult to read	
system response is slow	
ambiguous error messages	
illogical screen layout	
poor data storage design	

[consequences must be stated in business terms and can include explanations such as:

- **increased user errors**
- **delays in response time**
- **redundant data increases user confusion**
- **users are not as efficient as they should be**

**the same answer in two boxes got only one point]**

### A.4

[6]

Match the deliverables to the project phase or phases.

	analysis	design	construction	testing	installation	maintenance
acceptance test report	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
acceptance test specification	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
change requests	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
functional specifications	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
software architecture specifications	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
system test specifications	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

[black = must select, white = must NOT select, grey = doesn't matter  
see page fig 3.3 pg 50 in text]

**A.5** Indicate whether the following statements about methodologies and projects are true or false. For two (2) of your choices, you may provide an explanation of your choice of true or false. [6]

True	False	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	1 In order to be useful, any IS methodology must include techniques for discovering, analyzing, and modelling the relevant content for each of the following abstract views: data, process and temporal.
<input type="checkbox"/>	<input checked="" type="checkbox"/>	2 Despite the changing nature of projects and their problems, methodologies are successful in fulfilling all project and methodology objectives.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	3 Iterations are almost inevitable, because inadequacies in the requirements analysis may become evident during design, construction and testing.
<input type="checkbox"/>	<input checked="" type="checkbox"/>	4 CASE tools check models for consistency, completeness, syntactical correctness and relevance to user requirements.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	5 The spiral model includes a repeating cycle of planning, risk analysis, engineering and evaluation throughout the project.
<input type="checkbox"/>	<input checked="" type="checkbox"/>	6 The maintenance effort is not affected by the methodology used in creating the system.

**[black = must select, white = must NOT select, grey = doesn't matter (bonus point) if the answer was wrong, we read the reason below if one is given if the reason is reasonable, they get 1/2 or full mark]**

No. Reason for choosing true or false.

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**A.6** Give three (3) advantages and three (3) disadvantages of prototyping. [6]

advantages	disadvantages
<b>identify client misunderstandings early</b>	<b>misunderstanding of real effort</b>
<b>locate missing requirements early</b>	<b>divert attention from functional to interface issues</b>
<b>interface difficulties identified early</b>	<b>significant user involvement</b>
<b>feasibility/usefulness tested early</b>	<b>careful decision making needed</b>

**[answer is on page 53]**

**A.7** The requirements for a new system include functional, non-functional and usability requirements. For a typical input screen, such as needed to capture information about customers or to enter an order, give two examples for each kind of requirement.

[6]

<b>functional</b>	<ul style="list-style-type: none"> <li>• <b>processing information</b></li> </ul>
	<ul style="list-style-type: none"> <li>• <b>input and output descriptions</b></li> </ul>
<b>non-functional</b>	<ul style="list-style-type: none"> <li>• <b>performance, throughput</b></li> </ul>
	<ul style="list-style-type: none"> <li>• <b>backup/recovery, security, audit trails</b></li> </ul>
<b>usability</b>	<ul style="list-style-type: none"> <li>• <b>learnability, throughput performance</b></li> </ul>
	<ul style="list-style-type: none"> <li>• <b>operational feasibility</b></li> </ul>

**[answer is on page 121-122, pg 404  
answers above are more complete than students need to get full marks  
and not all possible correct answers are listed above]**

**A.8** Good cohesion in modules means that each module carries out a clearly defined process or group of processes that are functionally related to one another. This means that all the elements of the module contribute to the performance of a single function.

[6]

**poor cohesion type**

coincidental   **D**  

logical   **B**  

temporal   **C**  

sequential   **A**  

**example modules with following functionality...**

- A. create an order record,  
and update inventory with the amount entered
- B. capture customer information,  
and capture order information
- C. display toolbars,  
and display scrollbars
- D. print all outstanding orders,  
and print orders to be shipped today

**[answer is on page 307]**

**A.9** You are the senior analyst in a project to replace ROSI. You are asked by your project manager what investigation techniques you will use to determine the functionality of the new system. List the techniques you will use and give one brief example of what you expect to learn through each technique. Remember that each technique has both strengths and weaknesses. [10]

investigation technique	information you expect to gain
<b>interview</b>	<b>clearly stated on pages 122-131 incl</b>
<b>observation</b>	<b>ditto</b>
<b>read documents</b>	<b>ditto</b>
<b>questionnaires</b>	<b>ditto</b>
<b>background reading</b>	<b>ditto</b>

**[answer is on page 122-131 incl.  
focus on back finding, not opinion gathering]**

**A.10** Good dialogue design has the characteristics listed below. For each characteristic, give one (1) example of how NOT to design a user dialogue screen for buying books or CD's from an online store such as Amazon. [4]

characteristic	example of how NOT to do it
consistency	<b>clearly stated on pages 393-395</b>
appropriate user support	<b>ditto</b>
adequate feedback	<b>ditto</b>
minimal user input	<b>ditto</b>

**[answer is on page 393]**

**A.11** We can evaluate how user friendly an application is. Below are four criteria.  
 For each one, indicate how you would measure the user-friendliness of the system.

[4]

criteria	example of measurement
learnability	<b>(how long it takes to become competent)</b>
throughput	<b>(work done accuracy)</b>
flexibility	<b>(accommodate changes to tasks or environment)</b>
attitude	<b>(like and or use the system)</b>

**[answer is on page 404  
 defining the term does not constitute providing an example!]**

**A.12** Draw an Entity Relationship Diagram demonstrating the following:

[6]

- an application system has several releases over its lifetime.
- one release consists of several components.
- one component may have several versions over its lifetime.
- one version of a component may be included in several releases.

**students can use any convention provided they do so consistently**

**must show the following:**

- **application has one or more releases and a release applies to exactly one application**
- **component has one or more versions and a version applies to exactly one component**
- **since application releases and component versions are a many-to-many relationship, a new entity called **release/version** must be defined and:**
  - **one **release/version** applies to exactly one release and exactly one version**
  - **one version may have 0 or many **release/versions****
  - **one release will have 1 or many **release/versions****

**A.13** Make the following changes to the diagrams below for the point of Sale System.:

[12]

- The stock clerk wants a report showing items that are running low.
- The system is upgraded to automatically post (send) cash receipts (information) into an external cash management system.

**additions to the context diagram are:**

**from process 0:**

**data flow low items report goes to new entity stock clerk**

**data flow cash receipts goes to new entity cash management system**

**additions to the level 0 diagram are:**

**new process print items low report has:**

**data flow inventory balances coming in from the inventory data store**

**data flow low items report going to the entity stock clerk**

**new process post cash receipts has:**

**data flow cash receipts coming in from the sales total data store**

**data flow cash receipts going to the entity cash management system**

**note that the second process above could be eliminated and**

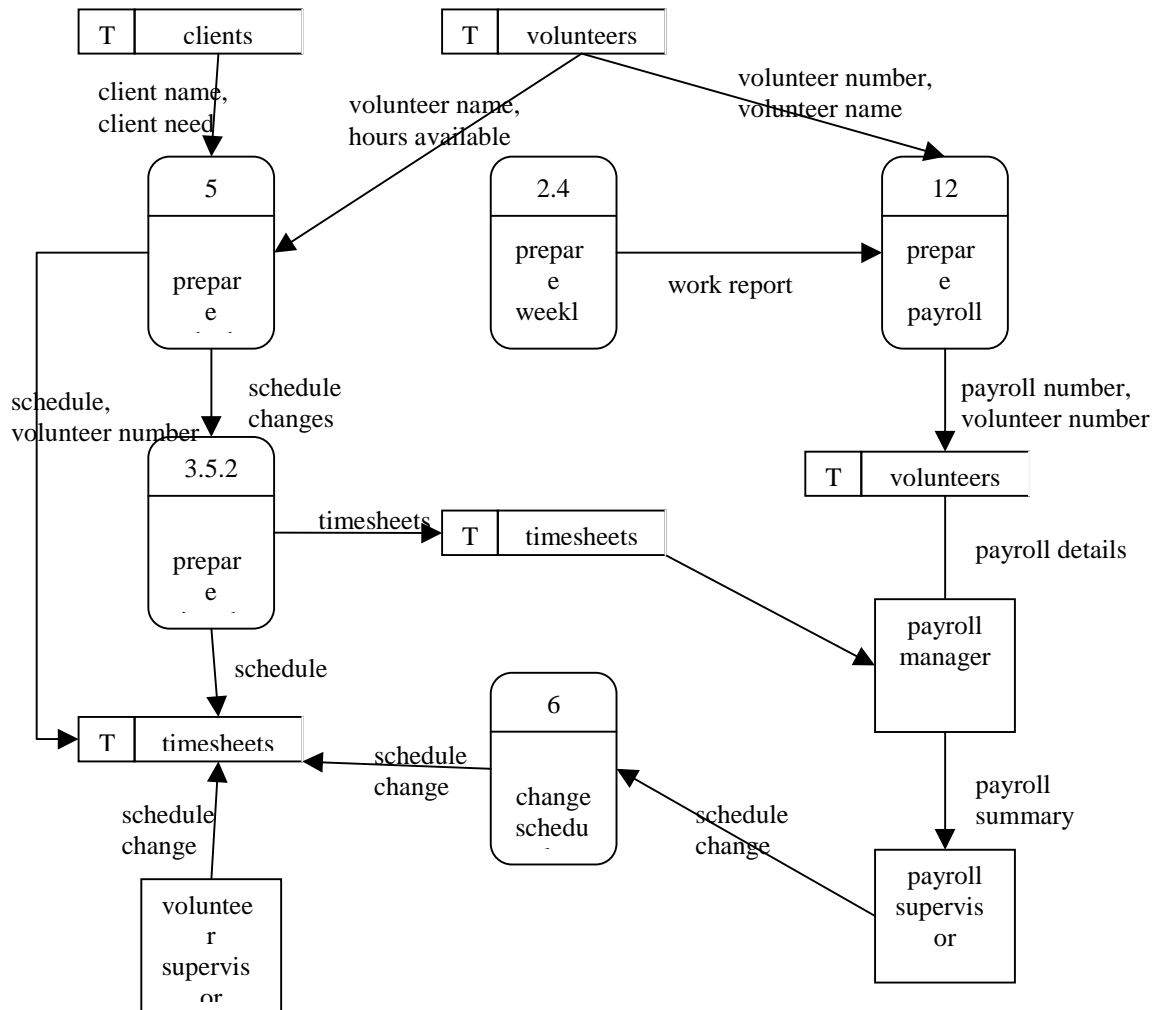
**from process 1 you could have**

**data flow cash receipts going to the entity cash management system**

**A.14** There are mistakes in the diagram below. Find seven (7) mistakes.

[7]

Put the number near the mistake and explain the problem below. You do not have enough information to locate subtle analysis or design errors, so look mainly for diagramming errors.



- **process 2.4 has no input**
- **payroll details flow has no arrowhead**
- **diagram includes processes from different hierarchy levels**
- **volunteer's data flow "schedule change" should have a process to capture data**
- **entity to entity data flows should not be shown**
- **all data stores should have unique id's**
- **same data store name but different contents (timesheets)**
- **all flows must be labelled**

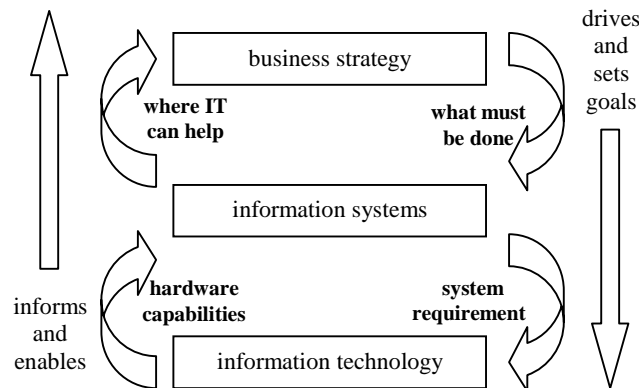
**note that catching the same error twice still gets only one mark**

## SECTION B – answer only one (1) of the questions.

**B.1** In the diagram below, the arrows indicate the:

[10]

Information Technology Strategy informs and enables the Information System Strategy  
Information System Strategy informs and enables Business Strategy  
Business Strategy drives and sets goals for Information System Strategy  
Information System strategy drives and sets goals for Information Technology Strategy



For each of the four influences, write one paragraph explaining how it happens and giving one example.

**main problem with answers to this were:**

- **rephrasing only**
- **examples were too weak (did not explain)**

**B.2** IS projects fail because of failure in:

[10]

the **product** (the final system produced)  
the **process** (the way the project was run).

Give 5 reasons for product failure and 5 reasons for process failure.  
Along with each reason give an example. Be brief and precise.

**main problem with answers to this were:**

- **symptoms and causes were mixed**
- **confusion between product (the delivered application) and process (the methodology)**
- **examples were weak (did not explain)**

**B.3** User involvement in a project is critical. For two (2) of the following methodologies,

[10]

explain to users what they would do during the project. Give four (4) areas of involvement for each of the two methodologies. Then point out the differences between the involvement areas.

- waterfall
- spiral or incremental
- prototype

**main problem with answers to this were:**

- **no real differences in answers for two selected methodologies**
- **user involvement was too ambiguous**