Carleton University
Department of Systems and Computer Engineering
SYSC-4101/5105 Midterm 1, Fall 2017 (group 1)

Name : _____ Number : _____ **Mark : ____ / 60**

General advice: If you need to make an assumption, you are urged to state it clearly and then proceed with your answer.
Answer on this examination paper.

Question 1 [6 marks]
Circle the correct answer.

a) One checks, by reading through the text of use case descriptions, that all the data the system should know about are somewhat given to the system, used by the system or produced by the system in at least one use case.
This is validation This is verification

b) One is checking that the Graphical User Interface of a piece of software follows accepted GUI design standards.
This is validation This is verification

c) One checks through software executions whether the responses of the software are the ones the user/client would expect.
This is validation This is verification

d) One considers a state model and devises tests so that each state of the model is exercised at least once by the set of test cases, and then determines to what extent transitions of the state model are exercised.
This is black-box testing This is white-box testing

e) One devises test inputs from a user-defined specification, executes the code with those inputs and measures how many statements of the code have been exercised.
The all-statement criterion is a
coverage criterion selection criterion

f) One considers a state model and devises tests so that each state of the model is exercised at least once by the set of test cases, and then determines to what extent transitions of the state model are exercised.
The all-transition criterion is a
coverage criterion selection criterion

Question 2 [5 marks]
What are the key elements of the IEEE definition for Verification?

Question 3 [4 marks]
A test oracle has two distinct tasks: What are they?

Question 4 [5 marks]
What is a fault?

Question 5 [5 marks]
Why do we say observability is an issue in software testing? Use a simple example to illustrate.

Question 6 [1 marks]
Cite one verification and validation technique other than software (dynamic) testing.

Question 7 [12 marks]
A function you have to test takes an integer as input and behaves differently, i.e., performs different kinds of computations, depending on whether the input value is strictly below -25, or is strictly smaller than zero, or is smaller or equal to 30, or is greater than 30.

Which of the following is **a** good selection of input values to exercise partitions (equivalence classes) of the input domain?

Circle your answer (either A, B, C, D, E or F).

Justify your answer, i.e., justify *why your selection is **the** good selection* and *why each of the other ones is not a good selection*.

A	-30	-10	12		
B	-27	-8	0	15	50
C	-35	0	25	60	
D	-112	-10	0	30	55
E	-45	-20	20	60	
F	-15	9	33		

Question 8 [12 marks (7+6)]
Consider the following set of characteristics and choices.

- Characteristic 1 has three choices labeled A, B and C;
- Characteristic 2 has two choices labeled x and y;
- Characteristic 3 has three choices labeled 1, 2 and 3;
- Characteristic 4 has two choices labeled O and P.

1. Build a series of combinations of choices (i.e., test case specifications) that is adequate for the Each Choice criterion. (You may want to explicitly state what the test objectives are.)

2. What are the test requirements for the all-pairs criterion?

Question 9 [5 marks]
To enter an engineering program at University ABC, a high school student must submit an e-audit that satisfies the following conditions (which can be automatically checked on the e-audit):

- an overall GPA of a least 8 out of 12;
- a core GPA of at least 9 out of 12;
- completion of four courses of type P: the allowed types of courses are P, A, B, M and L.

Create characteristics and blocks for the e-audit parameter.

Question 10 [5 marks]
A function takes two parameters of type integer as inputs. Your colleague defined the following characteristics (also sometimes called categories) along with some blocks (also sometimes called choices) for the two parameters.
Characteristic for the first parameter:

Block 1: <=0
Block 2: >12
Block 3: >0 and <12

Characteristic for the second parameter:

Block 1: <=0
Block 2: >=0 and <=31

Question: There are a number of issues with this specification of blocks. Can you spot them? Succinctly justify.