UNIVERSITY *of* LIMERICK

OLLSCOIL LUIMNIGH

FACULTY *of* SCIENCE *and* ENGINEERING

Department of Computer Science
and Information Systems

End-of-Semester Assessment Paper

Academic Year:	**2008/2009**	Semester:	**Spring**
Module Title:	**Software Quality**	Module Code:	**CS4157**
Duration of Exam:	**2½ Hours**	Percent of Total Marks:	**80**
Lecturer(s):	**Dr. Ita Richardson**	Paper marked out of :	**80**

Instructions to Candidates:

- Answer question 1 and any 2 other questions.
- Question 1 is worth 30 marks; Question 2, 3, 4 are worth 25 marks each.

Q1. Answer all parts

a) Describe the differences between a continuous model and a staged model for Software Process assessment. (5)

b) Briefly discuss 5 attributes of a 'good' software product. (5)

c) Briefly discuss 5 reasons why an organisation would carry out an assessment of their software process. (5)

d) Discuss 5 reasons why software projects fail. (5)

e) Discuss how the Software Process Capability and dEtermination model can be used to identify gaps in an organisation's software process. (5)

f) The Cause and Effect diagram (Diagram 1), shows a number of reasons why the phone was not answered. Describe 3 causes in detail, and suggest corrective actions which may be taken by the organisation to ensure that the phone is always answered. (5)

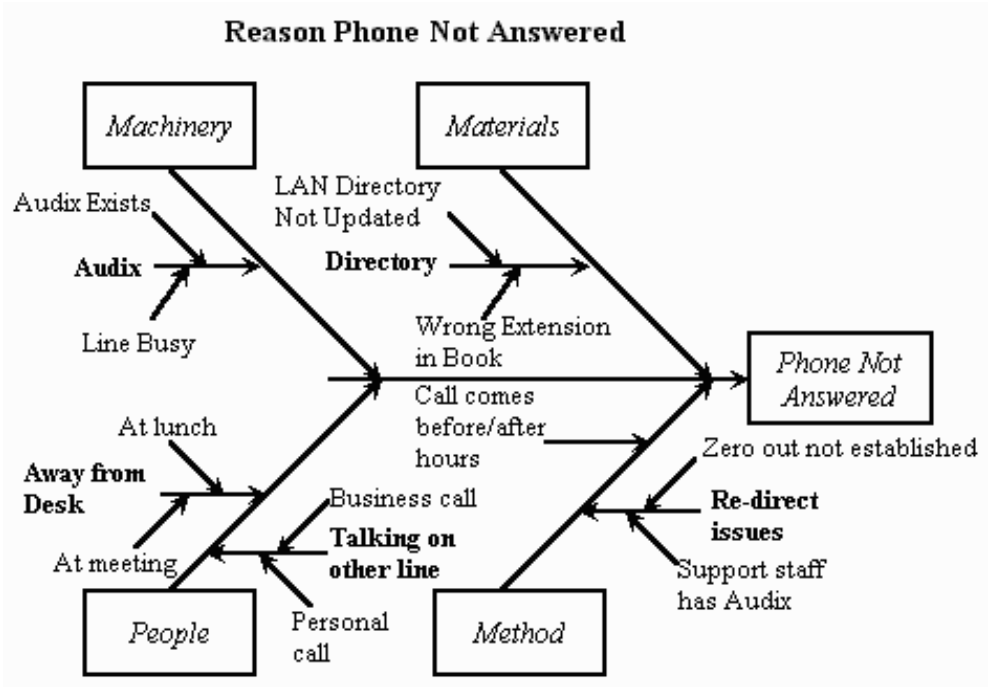

Diagram 1 (Question1)

Q2.

a) Giving examples, discuss the differences between Black Box testing and White Box testing. (6)

b) Discuss 2 advantages and 2 disadvantages of White Box testing. Discuss 2 advantages and 2 disadvantages of Black Box testing. (4)

c) You are required to develop a stratified sample to test a system which will calculate students' QCA. You are aware that the undergraduate population is 15000 students in year 1 (5000), year 2 (4000), year 3 (3000), year 4 (3000). As each year progresses, it becomes more important that the QCA calculation is done correctly. Suggest a stratified sampling strategy which ensures that 10% of students' QCAs are calculated. (8)

d) Discuss two techniques used by Agile Methods developers to help improve the quality of software development within their organisations. (7)

Q3.

a) Diagram 2 relates to Global Software Development. Distance is a factor contributing to the complexity of the environment. Distance in itself is not the problem – lack of co-ordination, visibility, communication and cooperation are the contributors. Discussing four problems which arise due to the implementation of global software development, give at least one example of how recognition of and implementing solutions to each of these problems can improve co-ordination, visibility, communication and / or cooperation. (20)

b) Discuss why a small Irish software development company may be more interested in achieving certification through ISO9000:2000 rather than from the Capability Maturity Model Integrated. (5)

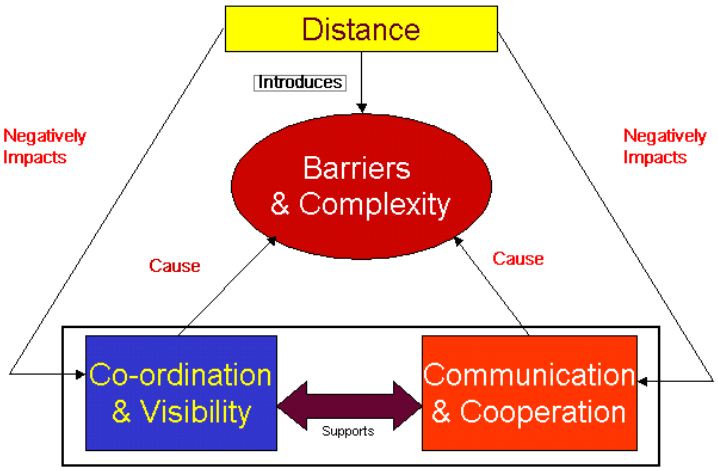

Diagram 2 (Question 3)

Q4.

a) According to McCall's classification system, software quality factors can be considered within the classifications of Product Operation, Product Revision and Product Transition. List five factors which should be taken into account when developing software, defining the classification to which they belong. Discuss each of these factors in detail. (10)

b) Company International Software has asked you to analyse their process. They have provided you with the data from 4 of their projects, Ireland, Romania, India, Brazil, in Table 1. The timeframe for these projects is:

Ireland – July 2006 to June 2007
Romania – Dec 2006 to Nov 2007
India – Aug 2007 to July 2008
Brazil– April 2008 –Mar 2009.

Present the data using at least 3 different statistical charts. Discuss what you have found from presenting the data in this format. (12)
List one question you would ask and why you have chosen to ask this question? (3)

Table 1	**Ireland**	**ROMANIA**	**INDIA**	**BRAZIL**
No.Errors (Testing)	**No.Programs**	**No.Programs**	**No.Programs**	**No.Programs**
< 20	12	45	33	62
< 40	21	68	88	106
< 60	25	80	130	142
< 80	30	103	139	213
< 100	36	148	158	265
< 120	45	150	172	299

Table 2	**IRELAND**	**ROMANIA**	**INDIA**	**BRAZIL**
	No. Errors	**No. Errors**	**No. Errors**	**No. Errors**
Functions Missing	10	17	14	0
Calculations Incorrect	12	15	24	2
Interface Incorrect	14	12	24	3
Accepting Invalid Data	28	21	15	1
Files not Updated	17	25	11	0
Speed of System	2	5	8	31

Table 3	**IRELAND**	**ROMANIA**	**INDIA**	**BRAZIL**
No of Classes	330	258	143	187
Team Members	8	4	5	10

Table 4	**Q1**	**Q2**	**Q3**	**Q4**
IRELAND				
Actual Hours (Average per team member)	400	350	300	350
Planned Hours	450	420	400	350
Overtime (as % Actual)	30%	20%	10%	10%
ROMANIA				
Actual Hours (Average per team member)	350	320	320	320
Planned Hours	380	380	370	370
Overtime (as % Actual)	0%	0%	10%	10%
INDIA				
Actual Hours (Average per team member)	420	300	300	300
Planned Hours	400	400	400	400
Overtime (as % Actual)	30%	20%	20%	20%
BRAZIL				
Actual Hours (Average per team member)	368	360	375	380
Planned Hours	370	370	370	370
Overtime (as % Actual)	5%	0%	10%	10%

Actual - Time worked on project
Planned - What we planned for

Table 1 (Question 4)