GMIT
GALWAY-MAYO INSTITUTE OF TECHNOLOGY
INSTITIÚID TEICNEOLAÍOCHTA NA GAILLIMHE-MAIGH EO

GMIT EXAMINATIONS
SESSION: SUMMER 2015

COURSE: BACHELOR OF SCIENCE (HONOURS)
IN SOFTWARE DEVELOPMENT

YEAR/STAGE: AWARD

SUBJECT: SOFTWARE ENGINEERING TIME:

EXTERNAL EXAMINERS: DR. MICHAEL SCHUKAT
MR. TOM DAVIS

INTERNAL EXAMINERS: MS. N. HURLEY

TIME ALLOWED: 2 HOURS

INSTRUCTIONS TO CANDIDATES:

Answer ANY THREE questions

All questions carry equal marks

Attachments:	Yes	□	No	□	If yes, please list details:
Special Requirements:	Yes	□	No	□	If yes, please list details:
Calculators permitted:	Yes	□	No	□	Not applicable

Answer any THREE questions

1.(a) What are the four most important attributes which all software products should have?
Suggest other attributes you consider are important. (7 Marks)

(b) One of the reasons why some apparently simple activities cannot be fully computerised is the need for tacit knowledge.
Provide an example of an activity which involves tacit knowledge.
Outline the advantages of retaining some level of human processes within a business system. (8 Marks)

(c) Identify the maintenance classification:

1. A database is storing data in such a way that it is causing problems for other systems within the company.

2. A company has introduced a online system for customers to place orders.

   The online system needs to be integrated into their normal ordering system.

3. A bank decides to offer a new mortgage product. This will have to be

   included in the system so that mortgage interest and payments can be

   calculated.

4. A more advanced help system is added to the current system.

5. A better data input screen is added to a part of the current system.

6. An individual bought an incandescent light bulb.

   The manufacturing company mentioned that the life span of the bulb is 3 years. Just before the 3 years, the individual decided to replace the bulb with a new one. (12 Marks)

(d) Under what circumstances might an organization decide to scrap a system when the system assessment suggests it is of high quality and high business value? ($6^{1/3}$ Marks)

2.(a) Briefly describe THREE requirement validation techniques. (5 Marks)

What kinds of errors are sought during requirements validation? (3 Marks)

(b) Explain THREE of the following terms in relation to Requirements Engineering:

- System Requirements

- User Requirements
- ViewPoints
- Stakeholders (6 Marks)

(c) An automated ticket-issuing system sells rail tickets.
The following is the requirements statement for this ticket-issuing system

> Users select their destination and input a credit card and a personal id number. The rail ticket is issued and their credit card charged. When the user presses the start button, a menu display of potential destination's is activated, along with a message to the user to select a destination. Once a destination has been selected, users are requested to input their credit card. Its validity is checked and the user is then requested to input a personal id. When the credit transaction has been validated, the ticket is issued.

a) Discover ambiguities or omissions in the following statement of requirements for part of a ticket–issuing system. ($7^{1/3}$ Marks)

b) Write out a set of non functional requirements for the ticket Issuing system, setting out its expected reliability and its response time. (7 Marks)

(d) Pick THREE plausible user requirements for the ticket-issuing system,
Now write THREE test cases which link back to these requirements.
These test cases should include instructions and expected results. (5 Marks)

3.(a) Can risks be ignored during agile software development? (7 Marks)

(b) Discuss some risks that may arise in software projects under THREE of the following headings.

- Technology
- Staff
- Business Impact
- Customer
- Product Size (12 Marks)

(c) A colleague of yours is running a small software company.
She has heard of your interest in software management and has asked you how she should proceed in order to introduce risk management in her company.
Give her advice, justifying this advice. (8 Marks)

(d) Fixed price contracts may be used to move project risk from client to contractor. Suggest how the use of such contracts may increase the likelihood that product risks will arise. ($6^{1/3}$ Marks)

4.(a) Dissatisfaction with 'heavyweight' methods for software development has

prompted a number of software developers to use adaptive process models. In the case of the 'Waterfall' method, which would be a typical 'heavyweight' method, outline the reasons for this dissatisfaction. (8 Marks)

(b) Suggest the most appropriate software process model that might be used as a basis for managing the development of the following systems. Explain your choice.

- Virtual reality system
- University accounting system
- Interactive timetable (9 Marks)

(c) Explain the following terms, as related to SCRUM in an agile environment:

- Scrum Master
- Scrum Product Backlog
- Burn Down Chart
- Velocity (10 Marks)

(d) Discuss the advantages associated with using Scrum in software projects. ($6^{1/3}$ Marks)

5.(a) Differentiate between static testing and dynamic testing. Describe the key approach used in static testing. (7 Marks)

(b) Traceability between requirements and test cases can help to show that the system does what it is intended to do. What can be done in order to minimise the risk of the system doing what it shouldn't. ? (7 Marks)

(c) There are many strategies that can be used to test software. Describe FOUR kinds of tests which should be considered. (12 Marks)

(d) Discuss which tests should be automated. When is it not suitable to perform automation? ($7^{1/3}$ Marks)