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

GMIT EXAMINATIONS
SESSION: SUMMER 2016

COURSE: BACHELOR OF SCIENCE (HONOURS)
IN SOFTWARE DEVELOPMENT

YEAR/STAGE: 4

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

1.(a) What are the differences between generic software product development and custom software development? (7 Marks)

(b) Apart from the challenges of heterogeneity(diversity), rapid delivery and trust, identify other problems that software engineering is likely to face in the twenty first century. (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. The Government recently changed the VAT rate from 17.5% to 20%. This change meant that many organisations had to make alterations to their systems.

3. System is handling error conditions in a more useful way

   e.g. instead of a cryptic "Error 3045 occurred" warning,

   the screen actually explains what that means and what the

   user can do about it.

4. Re-organizing data sets within a database so they can be searched

   faster or use less storage

5. Software patch that the user downloads or it is sent to their computer by the IT staff over the company network.

6. Air-conditioner which is serviced every year before summer. (12 Marks)

(d) Businesses, with a large number of legacy systems, regularly assess them using *business value* and *system quality* as assessment criteria. Explain how business value and system quality are determined. ($6^{1/3}$ Marks)

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

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

(b) Discuss why inconsistencies exist in software requirements. ($7^{1/3}$ Marks)

(c) Write out a set of functional requirements for an online banking system. (8 Marks)

(d) Write out a set of non functional requirements for an online banking system. (10 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 software-development company specialising in software for the medical device industry, wishes to reduce the risk of 'failure during operation' of the software in their portfolio of applications .
Advise this company on how they should proceed and what they should do in order to attain such a goal. (7 Marks)

(d) You are the manager of a project which is running behind schedule.
The client dictates that an operational version of the project has to be released in 3 months time.
Careful estimation and risk analysis indicates 9 months will be required.
Briefly comment on the implications of Brooks observation that 'adding man power to a late project makes it later'.
List and briefly discuss steps you could take as a manager in negotiating with the client to avoid unrealistic deadlines. ($7^{1/3}$ Marks)

4.(a) Explain the benefits of Prototyping when used in the software development process. (5 Marks)

What is the objective of Throw-away Prototyping? (3 Marks)

Explain why the throw-away prototype should not be considered as a final system. (2 Marks)

(b) Individual software engineers can vary greatly in their abilities.
This adds a dimension of uncertainty about how effective a particular software development process will be.
Select two process models that handle this uncertainty particularly well, describing how they do so. (7 Marks)

(c) Differentiate between the roles of Product Owner and scrum master as related to SCRUM in an agile environment: (6 Marks)
Who may terminate a sprint in Scrum outline the circumstances when this may arise. (2 Marks)

(d) Typical advise to software development teams working in an agile environment would be:
"Start with Scrum and then invent your own version of Extreme Programming(XP)."
Provide a discussion which contrasts the differences between SCRUM and Extreme Programming(XP). ($8^{1/3}$ Marks)

5,(a) Differentiate between static testing and dynamic testing.
Outline the advantages of static testing. (7 Marks)

(b) Describe FOUR examples of Non Functional Testing. (10 Marks)

(c) Discuss both the benefits and challenges for a software tester who works as part of an Agile Team. (8 Marks)

(d) Describe the test levels described in the V-model framework. ($8^{1/3}$ Marks)