MONASH University

**Semester Two 2017
Examination Period**

Faculty of Information Technology

EXAM CODES:	**FIT2101**
TITLE OF PAPER:	**SOFTWARE ENGINEERING PROCESS AND MANAGEMENT** **MARKING SCHEME**
EXAM DURATION:	2 hours writing time
READING TIME:	10 minutes

THIS PAPER IS FOR STUDENTS STUDYING AT: (tick where applicable)

☐ Berwick ☑Clayton ☑ Malaysia ☐ Off Campus Learning ☐ Open Learning
☐ Caulfield ☐ Gippsland ☐ Peninsula ☐ Monash Extension ☐ Sth Africa
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AUTHORISED MATERIALS

OPEN BOOK	☑ **YES**	☐ **NO**
CALCULATORS	☐ **YES**	☑ **NO**
SPECIFICALLY PERMITTED ITEMS **if yes, items permitted are:**	☐ **YES**	☑ **NO**

Candidates must complete this section if required to write answers within this paper

STUDENT ID: _ _ _ _ _ _ _ _ _ _   DESK NUMBER: _ _ _ _ _ _

Question 1 (15 marks)
*This question is about **requirements**.*

Flowr is a new project that has been described by its creators as "Uber, but for florists".

This is how Flowr is supposed to work: *Participating florists, gift stores and delivery drivers register themselves with Flowr using a web form. Customers can use a phone app to place online orders for flowers, chocolates, and other gifts. Flowr emails these orders to local stores to be filled. Store staff use a web application to notify Flowr when the order is complete. Flowr then sends a nearby delivery driver to pick up the order and bring it to its recipient.*

Here are six suggested Product Backlog Items for Flowr.

1. As a user, I want to cancel a delivery.
2. As a developer, I want to finish designing the database so that I can start building the user interface next sprint.
3. As a customer, I want the site to be easy to use so that I can send flowers to my mother.
4. As a store owner, I want to be able to manage orders so that I do not run out of stock.
5. As a non-authenticated Flowr user, I want to enter my username so that the system will prompt me for my password.

These stories all have problems. For each story:
   a) state what is wrong with it, and
   b) suggest a better version – if you can't do that without more information, suggest questions you could ask the Product Owner or client instead.

3 marks per story, 2 for part a) and 1 for part b), unless otherwise stated.

1: As a user, I want to cancel a delivery.

   a) No value model. (0.5, but only if that's all they've said for this story.)
      A worse problem is that "user" is ambiguous, and so is "cancel a delivery" – what triggers this
      cancellation, and are we talking about a delivery currently under way, are we pre- or post-payment,
      etc. If we're talking about *any* user, then we have a compound user story. (2 marks)
   b) Can't be improved without more information. Who is the user – is it the customer, store owner,
      driver? When and why is the cancellation happening? (Up to 1 mark if questions match the problems
      identified in part a). Nothing for just saying "add the business value".)

2: As a developer, I want to finish designing the database so that I can start building the user interface next
sprint.

   a) This is a developer story, not a user story. (0 if this is all they say – developer stories are fine as PBIs.)
      Does not provide business value/user-visible functionality. (Up to 1.5 if this is all they say for
      identified problem.) This is a horizontal slice of functionality rather than a vertical slice. That's okay
      for a task in a sprint backlog, but not for a story in a product backlog. There's not enough information
      for the PO to be able to prioritize the story. (2 marks)
   b) Either rephrase as a user story or make it a task in the sprint backlog. (1 mark for something sensible
      that matches the problems identified in a)

3: As a customer, I want the site to be easy to use so that I can send flowers to my mother.
   a) What does "easy to use" mean? This is either a request for unspecified features or a non-functional
      requirement. (2 marks for **either** point, clearly stated.)
   b) Need to either specify some ease-of-use features to add or work usability testing into definition of
      done for release, etc. Either approach is fine provided it matches part a).

4: As a store owner, I want to be able to manage orders so that I don't run out of stock.
   a) Compound and/or vague user story. The problem is with the phrase "manage orders".
   b) What does "manage orders" mean? Please tell me what you want to be able to do. This will probably
      end up eliciting several user stories.

      Max 1.5 marks overall (i.e. for a and b together) if student interprets "manage" as "delete" or some
      other singular action – this approach is likely to result in requirements being overlooked.

5: As a non-authenticated Flowr user, I want to enter my username so that the system will prompt me for my
password.
   a) This is half a user story – by itself, it doesn't provide any value.
   b) "As a non-authenticated Flowr user, I want to enter my username and password so that I can make
      orders." Other approaches are unlikely to be viable.

Question 2 (5 marks)
*This question is about **Agile methodologies***.

An established medium-sized company decides to have one of its teams try Scrum. Half-way through their first project, one of the developers on the team has this to say about the experience:

"We're not getting much done, to be honest. Part of the problem is the daily status meeting – on paper it's only supposed to take an hour, but it keeps going over time. I'm also spending at least half an hour a day preparing my PowerPoint slides. Things were much better when our status meetings were once a month."

What is this team doing wrong, and what should they do to fix the problem? Write about half a page.

What team is doing wrong: this team seems to have replaced their monthly status meetings with daily status meetings instead of daily standups. Standups should be *much* shorter than an hour, and should not involve PowerPoint slides at all.

3 marks: recognizes that team is sticking to earlier practice; articulates problems with expected length as well as format.

2 marks: reasonable answer but missing a major point

1 mark: on right track but not close enough for a pass.

Deduct half a mark if vague or contradictory.

What to do: team should confine themselves to the Three Questions: what did you do yesterday? What will you do today? What is blocking you? Timeboxing the meeting would be a good idea.

2 marks: mentions the Three Questions and suggests a mechanism for keeping meetings short.
1 mark: saying "shorter meetings" or similar.

Again, deduct half a mark if vague or contradictory.

Question 3 (5 marks)
*This question is about **software development practices***.

Continuous deployment is a development methodology in which completed software features are automatically built, tested, and (if the tests pass) deployed to end users.

What are the advantages and disadvantages of continuous deployment in an Agile project, compared to manual deployment? Write up to half a page.

Advantages: Can get feedback from genuine end users more quickly, so PO and team will be better informed. Improved responsiveness to feedback from users (i.e. faster turnaround for requested changes). Faster response to changes in business conditions.

Other answers possible. 1 mark per unique valid point to a maximum of 3. Deduct half a mark if vague.

Disadvantages: Need to have very thorough test suites for this to work. Harder to set up. Risky; could end up with downtime or security issues if there are errors that unit tests don't spot.

Other answers possible. 1 mark per unique valid point to a maximum of 2. Deduct half a mark if vague.

Question 4 (1 + 2 + 2 = 5 marks)
This question is about **stakeholder identification**.

The Golden Days nursing home is a residential care home for people who are unable to look after themselves because they are elderly, disabled, or sick. They provide medical care as well as cleaning, laundry, and housekeeping services, with nursing staff present 24 hours a day and doctors on call.

Golden Days wishes to computerize its meal planning. They hope to minimize the amount of food wasted while making sure that all residents are eating fresh, nutritious food. The system will need to take into account the residents' preferred types of foods, medical and dietary needs, allergies, and any religious restrictions (e.g. for kosher or halal food) as well as the price and storage requirements of the ingredients. Each day, it will present the kitchen staff with instructions on what to cook for each resident. At the end of each week, the administrative staff will be able to print a list of the ingredients that need to be purchased to create next week's meals.

    a)   What is a *stakeholder*?

Somebody who cares about the system, either because they are financially or emotionally invested in it, because they are users of the system, because their data is held in the system, etc.

1 mark for a reasonable definition.

    b)   Identify the stakeholders for this system.

Residents and their loved ones (system is used to meet their needs). Admin staff (end users). Accountants/finance staff (care about reduced food expenditure). Doctors/dieticians (SMEs; possibly users – dietary info has to come from somewhere). Kitchen staff (end users). Possibly rabbis/imams (as SMEs for religious observances). Not cleaners, housekeepers, laundry staff.

Minimum for 2 marks is admin staff, kitchen staff/cooks, residents/loved ones, medical staff, plus whoever's paying for the software. 1 if they omit any one of these or list somebody who's not a stakeholder (e.g. laundry staff).

    c)   Draw a stakeholder map showing the relative influence and interest of each stakeholder.

1 mark for recognizable format (2D, influence vs interest)
1 mark for reasonable placement of identified stakeholders on map

Question 5 (5 marks)
*This question is about **non-functional requirements**.*

Here is an example of a requirement that has been expressed as a user story:

> **As a customer, I want the system to be secure so that my personal information can't be accessed by a third party.**

What problems might this requirement cause if it is selected into the sprint backlog? Suggest an alternative way to ensure that the requirement is met. Write about half a page.

Problems: doesn't stay "Done"; any new piece of functionality added may cause it to break. Or: hard to verify that it is Done. Other answers *may* be possible but these are the two most likely. Either is sufficient for 2 marks if well-stated.

Alternative way to ensure that requirement is met: add security testing to Definition of Done, either for sprint or release. Or, devise a security-testing/pen-testing protocol. Or, engage the services of a pen-testing team. Up to 3 marks for reasonable suggestion that matches the issues identified above.

Question 6 (5 marks)
*This question is about **Scrum practices**.*

Here is an excerpt from one team's Project Management Plan:

Amanda: Scrum Master. Amanda's responsibilities:
- Approving or rejecting client's requests for changes to requirements
- Allocating user stories to sprints
- Allocating tasks to developers and ensuring that they are completed on time
- Ensuring that team members have access to the hardware and software they need
- Informing team members of the velocity that will be required in order to meet sprint deadlines
- Running daily meetings in which developers are informed of their tasks for the day

What advice would you give this team about the Scrum Master role, and why? Write about half a page.

This team is probably transitioning towards Scrum from a traditional management structure, and Amanda's role looks more like a traditional Project Manager role than a Scrum Master's.

For full marks, student must write clearly and identify *at least five* of the following:
- This position statement is based around command-and-control management and is incompatible with servant-leadership (does not have to use this terminology)
  - Equivalently, the Scrum Master role should be about facilitation and support
- Allocating stories to sprints is the responsibility of the Product Owner, not the SM
- Developers should organize the task allocation themselves, with SM only stepping in if there's a dispute that needs to be mediated
- That's not how velocity works (it's a metric that allows teams to estimate how much work should be attempted in a sprint)
- That's not how daily standups work (developers are *asked about* their tasks for the day, not told what to do)
- Ensuring that team members have all the equipment they need to do their jobs *is* part of the SM role; that responsibility is a good one.

Max 1 mark if the student talks about Scrum Mastery in general without addressing the specifics of the question.
Max 3 marks if they don't address the reasons behind their advice.

Question 7 (5 marks)
*This question is about **teamwork**.*

One of the practices that DeMarco and Lister identified as "teamicidal" (i.e. bad for teamwork) is having team members spread out across the building instead of sitting together. What are some of the challenges that Scrum teams face if their members are not located close by? Suggest some ways that teams might overcome these problems. Write about half a page.

3 marks for enumerating problems. May include: difficulty collaborating, difficulty breaking down silos, difficulty conducting Scrum ceremonies (sprint planning, daily standups, etc.)

2 reasonable and clearly-articulated points are sufficient. Deduct half a mark if vague.

2 marks for suggested solutions. For full marks, must address identified problems and be feasible and likely to work.

Question 8 (2 + 5 = 7 marks)
*This question is about **planning**.*

a)   What is *release planning*, and how is it different from sprint planning? (2 marks)

Release planning is planning at release level, including which features should be included in which release. (1 mark)

Sprint planning plans only the current sprint. Release planning plans several releases ahead. Or: you don't typically release every sprint, so sprints are not the same as releases. Or: sprint planning goes down to the level of tasks, but release planning doesn't even go down to story level. (1 mark)

b)   Describe one technique that Agile teams can use to assist with release planning. (5 marks)

Write half to one page.

User epics is most likely – bundle related stories into releasable/marketable feature sets. Other answers are possible.

5 marks: relevant technique, well explained, suitable for Agile teams
3 marks: relevant technique but misunderstood, poorly explained, or unAgile
1 mark: student has said something about some kind of planning

If torn between two levels, split the difference.

Question 9 (10 marks)
*This question is about **risk management**.*

Here is the complete risk register for the Flowr project that was described in question 1.

Risk	Impact	Mitigation
Client loses interest in project	High	Terminate the project
Product Owner becomes sick or leaves the company	Medium	Ensure that somebody else can do the Product Owner role.
Unable to verify that our system works as expected in Internet Explorer 4	Moderate	Ask client whether Internet Explorer 4 compatibility is required
Installation instructions might be hard for non-native English speakers to understand	Low	Include a link to Google Translate in installation instructions
Project server's hard disk crashes causing loss of source code	Severe	Ensure that off-site backups are kept of all data, including project source code. Check regularly that the backups are intact and can be restored.

What are the good and bad points of this risk register? What could the team do to improve it? Write no more than one page.

Good points: Risks are sensible. Mitigations are reasonable. All risks have impacts. (2 marks)

Bad points: Far too few risks identified. Risks lack likelihoods. Impact scale hard to understand. More are possible. (3 marks)

Improvements: Up to 2 marks per suggested improvement to a maximum of 5. Improvements must be reasonable, feasible, and relevant to the bad points identified.

Question 10 (3 + 5 = 8 marks)
*This question is about **retrospectives and metrics***.

Your team is worried because your team's velocity has been declining for several iterations and nobody is sure why – there have been no staff changes, and you have not changed the way you estimate or prioritize stories.

a) Suggest a possible cause for your declining velocity (3 marks).

Many possibilities: code rot/accrual of technical debt is most likely. 3 marks for identifying a likely and plausible cause. 2 marks if plausible but not likely. 1 mark for suggesting something that might happen but would not cause the velocity issue, or for suggesting something ruled out in the question.

b) Suggest a metric (i.e. some measurable property of your code or process) that you could use to help figure out if your suggested cause is the problem. Make sure to explain how to compute the metric and how to interpret it.

1 mark for naming a metric
2 marks for explaining how to compute the metric
2 marks for interpretation

Max 2 marks if identified metric does not address the identified cause.

Write up to one page.