

The University of Nottingham, Ningbo China

SCHOOL OF COMPUTER SCIENCE

A LEVEL 1 MODULE, SPRING SEMESTER 2018-2019

AE1FSE-COMP1035

INTRODUCTION TO SOFTWARE ENGINEERING

Time allowed: **ONE HOUR MINUTES**

Candidates may complete the front cover of their answer book and sign their desk card but must NOT write anything else until the start of the examination period is announced

Answer ALL 16 questions

No calculators are permitted in this examination.

Dictionaries are not allowed with one exception. Those whose first language is not English may use a standard translation dictionary to translate between that language and English provided that neither language is the subject of this examination. Subject specific translation dictionaries are not permitted.

No electronic devices capable of storing and retrieving text, including electronic dictionaries, may be used.

DO NOT turn examination paper over until instructed to do so

ADDITIONAL MATERIAL: None.

INFORMATION FOR INVIGILATORS: Collect examination question papers at the end of the examination.

SECTION A: Multiple Choice Questions

[Section A carries a total of 12 marks, each question carries 1.5 mark]

Choose the most correct option for each of the following questions

Question1: Which of the following options is wrong in terms of Software Engineering Ethics Issues related to professional responsibility?

- ☐ Confidentiality
- ☐ Managing Client Relationship
- ☐ Intellectual property rights
- ☐ Competence

Question 2: Systems Engineering is a discipline that is concerned with

- ☐ Systems that are composed of a software
- ☐ Systems that are composed of a hardware
- ☐ Systems that are composed of software and hardware
- ☐ All of the above

Question 3: Legacy systems refer to

- ☐ Old Systems
- ☐ New Systems
- ☐ Systems under development
- ☐ None of the mentioed above

Question 4: Which of the followings ***is not*** related to the use of a Waterfall Model during the Software Engineering process?

- ☐ Safety Critical Systems
- ☐ Rigorous requirements specifications
- ☐ Rapid changes of requirements
- ☐ A big size project

Question 5: A stakeholder in a software project can be

- ☐ A software user
- ☐ A client
- ☐ A project manager
- ☐ All of the above

Question 6: Which of the following options can best describe a software?

- ☐ A program code
- ☐ Users Manual
- ☐ A software configuration
- ☐ All of the above

Question 7: Which of the following options is an activity that distributes estimated effort across the planned project duration by allocating the effort to specific software engineering tasks?

- ☐ Software Macroscopic schedule
- ☐ Software detailed schedule
- ☐ Software Project scheduling
- ☐ Software resources scheduling

Question 8: Which of the following strategies means that the impact of the risk can be reduced?

- ☐ Avoidance strategies
- ☐ Contingency plans
- ☐ Lifecycle risk analysis
- ☐ Minimization strategies

SECTION B: Requirements Engineering and Project Management & Planning

[Section B carries a total of 18 marks]

Question 9: Define the following terms

A) Functional requirements

[2 marks]

B) Software Engineering

[2 marks]

C) Agile development

[2 marks]

Question 10: Name and describe the main activities of Requirements Engineering.

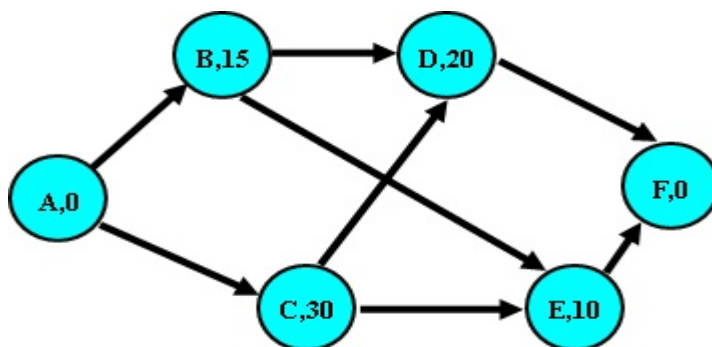
[4 marks]

Question 11: PERT Chart is a project management tool used to schedule tasks within a project. In the context of PERT chart answer the following questions:

A) What is a critical path?

[1 mark]

B) Identify the critical path in the following PERT chart. (You must show your calculation).



[3 marks]

Question 12: Quality management and software development are inevitably intertwined with people having both development and quality responsibilities. Give an outline structure of the quality plan as an integral part of the project planning process.

[4 marks]

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SECTION C: Agile Development

[Section C carries a total of 10 marks]

You work as a project manager for a large software company called *StocksRUS* Apps. The company has a strong requirements engineering team, and testing and quality assurance teams. The company has already gained a reputation for building high-quality financial software for stocks, conforming to the various legal and financial standards.

In the past, a major stock market company called *WeStock* had approached your company to build a core system that allows users to sell and buy stocks online. It took your company one year to finish the development of the core system successfully.

This year the *WeStock* Company approached you again in order to enhance their software in order to attract more customers. So far the *WeStock* Company knows two things; the company wants their software to allow clients to track their transactions, and they like to provide their clients with some long term predictions about future stocks' prices, these requirements involve some risk. Managers in the *WeStock* Company also would like to have more enhancements to their software, but they are not sure what enhancements can be added.

Based on this scenario answer questions 13 and 14.

Question 13: Describe two reasons, from the scenario, for adopting the traditional plan-based Software Engineering process.

[5 marks]

Question 14: Your team argues that agile process should be used instead of the traditional plan-based Software Engineering process. Why do you think that your team wants to adopt the agile process?

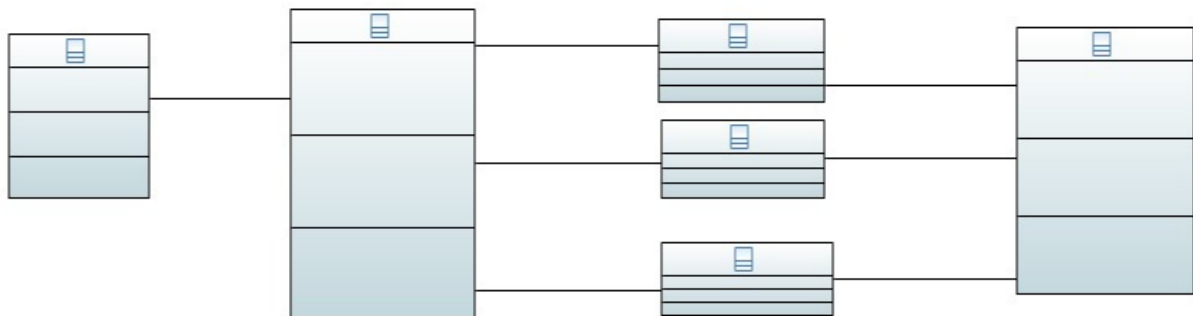
[5 marks]

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SECTION D: UML Modeling

[Section D carries a total of 10 marks]

The UNNC provides different major options for its students. For instance, the Faculty of Engineering has the School (Department) of Computer Science, Department of Electrical Engineering, and the Department of Aerospace Engineering. The students in each department have their modules, but they can have elective modules from other departments in the Faculty. The faculty has a Dean, and each department has a head of the department. In addition, each department has several lecturers, technicians, and secretaries. The provided blank class diagram is a partial model for this scenario.



Based on this Scenario answer questions **15** and **16**

Question 15: label the class diagram using the data provided in the table by showing each class name, necessary associations between classes, and multiplicities.

[3.5 marks]

Question 16: The previous class diagram has some design issues. Suppose that you added the **Department** class to your previous design.

A) What are the classes that will be related to the **Department** class?
[3 Marks]

B) What are the associations/relationships that must be **removed** from the previous design? **[1.5 Marks]**

C) What are the associations/relationships that must be **added** to the new design? **[2 Marks]**