



北京邮电大学



For examiners' use only

EBU5304 A

1	
2	
3	
Total	

Joint Programme Examinations 2017/18

EBU5304 Software Engineering

Paper A

Time allowed 2 hours

Answer ALL questions

Complete the information below about yourself very carefully.

QM student number

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BUPT student number

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Class number

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NOT allowed: electronic calculators and electronic dictionaries.

INSTRUCTIONS

1. You must **NOT** take answer books, used or unused, from the examination room.
2. Write only with a black or blue pen **and in English**.
3. Do all rough work in the answer book – **do not tear out any pages**.
4. If you use Supplementary Answer Books, tie them to the end of this book.
5. Write clearly and legibly.
6. **Read the instructions on the inside cover.**

Examiners

Dr Ling Ma, Dr Gokop Goteng, Dr Matthew Huntbach, Dr Karen Shoop

Instructions

Before the start of the examination

- 1) Place your BUPT and QM student cards on the corner of your desk so that your picture is visible.
- 2) Put all bags, coats and other belongings at the back/front of the room. All small items in your pockets, including wallets, mobile phones and other electronic devices must be **placed in your bag in advance. Possession of mobile phones, electronic devices and unauthorised materials is an offence.**
- 3) Please ensure your mobile phone is switched off and that no alarm will sound during the exam. **A mobile phone causing a disruption is also an assessment offence.**
- 4) Do not turn over your question paper or begin writing until told to do.

During the examination

- 1) You must not communicate with or copy from another student.
- 2) If you require any assistance or wish to leave the examination room for any reason, please raise your hand to attract the attention of the invigilator.
- 3) If you finish the examination early you may leave, but not in the first 30 minutes or the last 10 minutes.
- 4) For 2 hour examinations you may **not** leave temporarily.
- 5) For examinations longer than 2 hours you **may** leave temporarily but not in the first 2 hours or the last 30 minutes.

At the end of the examination

- 1) You must stop writing immediately – **if you continue writing after being told to stop, that is an assessment offence.**
- 2) Remain in your seat until you are told you may leave.

Question 1

a) Answer the following questions:

[10 marks]

- i) Explain the difference between stand-alone applications and Web-based applications.

(2 marks)

- ii) A software development team is distributed (team members are in different locations). Discuss the potential problems of using the Agile process in this team.

(2 marks)

- iii) What is a conceptual model? Which UML diagram is used to describe conceptual models?

(2 marks)

- iv) Discuss the advantages of having daily stand up meeting in the Agile process.

(2 marks)

- v) What is an iteration in the Agile process?

(2 marks)

[illegible]

[illegible]

b) Answer the following questions about Requirements:

[11 marks]

i) Explain the role of a stakeholder.

(2 marks)

ii) How can requirement conflict issues be resolved? Give an example of a requirement conflict and discuss what action should be taken to resolve the issue.

(7 marks)

iii) Why would the Fibonacci sequence be used for estimating story points?

(2 marks)

[illegible]

- c) PasswordValidator is a Java class that checks if a given password is valid. The acceptance condition of a valid password is “*The password should be between 5 to 13 characters*”. The isPasswordValid method in the PasswordValidator class is used to check the length of the password. This method takes the password as a String argument, and outputs true if the length is valid and false if the length is not valid.

You are using the Test Driven Development (TDD) approach and you need to write an automated test program to test the isPasswordValid method. Complete the following questions:

[12 marks]

- i) Design test cases using Partition Testing.

(6 marks)

- ii) Based on your test cases design in i), complete the test program in Figure 1.

(4 marks)

- iii) Complete the product code in Figure 2.

(2 marks)

```
import junit.framework.TestCase;

public class TestPassword extends TestCase{

    public void testPasswordLength(){

        //new PasswordValidator object
        PasswordValidator pv = new PasswordValidator ();

        //Write your code in the answer box

    }

}
```

Figure 1 Test program

```
public class PasswordValidator {

    public boolean isPasswordValid(String password){

        //Write your code in the answer box

    }

}
```

Figure 2 Product program

[illegible]

[illegible]

Question marking: $\frac{1}{10} + \frac{1}{11} + \frac{1}{12} = \frac{1}{33}$

Question 2

- a) A new online social media software company wants to introduce a rival platform to compete with WeChat in the Chinese market. The company has Chinese social media features and has added some western features that resemble those of WhatsApp to attract western users. Because this is new software that has not yet been introduced to the public, *the team of developers acknowledges that it is difficult and expensive to guarantee that the new software is completely free from errors*. However, the team also agrees that *they need to balance the needs to be achieved between meeting consumer demand for new products with guarantee about performance even if the software is not free from errors*. This means the software can still be used and appreciated by most users, even when there are some errors.

[10 marks]

- i) From the above, give a software engineering phrase or term that describes the phrases “*the team of developers acknowledges that it is difficult and expensive to guarantee that the new software is completely free from errors*” and “*they need to balance the needs to be achieved between meeting consumer demand for new products with guarantee about performance even if the software is not free from errors*”.

(3 marks)

- ii) Give FOUR conditions (or advice) to this company if it wants its new software to achieve the status of “High Quality Software” in the near future so that it can compete favourably with WeChat.

(4 marks)

- iii) List THREE types of risks that the software development team should consider when trying to improve the features of the new software.

(3 marks)

[illegible]

[illegible]

b) Describe Copyright and Copyleft.

[8 marks]

[illegible]

	<div>8</div> <div>marks</div>

c) Describe the FOUR freedoms which describe the strongest forms of “Free Software”.

[6 marks]

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	<div>6</div> <div>marks</div>

d) Describe FOUR ways in which the company Red Hat makes money from its open source Linux software.

[4 marks]

	Do not write in this column	
		4 marks

e) List the FOUR steps of testing strategy in software engineering.

[5 marks]

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	5 marks

Question marking: $\frac{\quad}{10} + \frac{\quad}{8} + \frac{\quad}{6} + \frac{\quad}{4} + \frac{\quad}{5} = \frac{\quad}{33}$

Question 3

- a) An important aspect of good quality software development is to *reduce dependency* between different parts of a program. Explain what is meant by this, and why it is important. Explain how the general idea of object-oriented programming fits in with this.

[12 marks]

[illegible]

[illegible]

- b) The Interface-Segregation Principle (ISP) is one principle of good program design that if kept to helps reduce dependency between different parts of a program. Explain what is meant by this principle in terms of programming in an object oriented programming language like Java. Explain how it helps reduce dependency and other ways in which it contributes to good program design.

[12 marks]

[illegible]

[illegible]

c) Explain the general idea of the Singleton design pattern, and how it works.

[4 marks]

[illegible]

- d) Explain the general idea of the Object Pool design pattern, and how it works. Give the reason why it would be used.

[6 marks]

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		6 marks

Question marking: $\frac{12}{12} + \frac{12}{12} + \frac{4}{4} + \frac{6}{6} = \frac{34}{34}$

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