
UNIVERSITI SAINS MALAYSIA

Second Semester Examination
2015/2016 Academic Session

June 2016

CPT441 – Software Quality Assurance & Testing
[Jaminan Mutu & Pengujian Perisian]

Duration : 2 hours
[Masa : 2 jam]

INSTRUCTIONS TO CANDIDATE:

[ARAHAN KEPADA CALON:]

- Please ensure that this examination paper contains **FIVE** questions in **SIX** printed pages before you begin the examination.

*[Sila pastikan bahawa kertas peperiksaan ini mengandungi **LIMA** soalan di dalam **ENAM** muka surat yang bercetak sebelum anda memulakan peperiksaan ini.]*

- Answer **ALL** questions.

*[Jawab **SEMUA** soalan.]*

- You may answer the questions either in English or in Bahasa Malaysia.

[Anda dibenarkan menjawab soalan sama ada dalam bahasa Inggeris atau bahasa Malaysia.]

- In the event of any discrepancies, the English version shall be used.

[Sekiranya terdapat sebarang percanggahan pada soalan peperiksaan, versi bahasa Inggeris hendaklah diguna pakai.]

1. (a) Contrast the idea of testing in V model and testing in iterative and incremental model.

Bezakan idea ujian dalam model V dan ujian dalam model iteratif dan tambahan.

(5/100)

- (b) Contrast the principles of “the pesticide paradox” and “defect clustering”.

Bezakan prinsip “the pesticide paradox” dan “defect clustering”.

(5/100)

- (c) Discuss the relationship between software testing and software reliability.

Bincangkan perhubungan di antara pengujian perisian dan kebolehpercayaan perisian.

(5/100)

2. Five modules of a banking application have been assigned to five different developers to reduce coding times. Figure 1 shows the module breakdown of the application. Analyse the scenarios given and answer the questions.

Lima modul aplikasi perbankan telah diberikan kepada lima pembangun yang berbeza untuk mengurangkan masa pengkodan. Rajah 1 menunjukkan pecahan modul bagi aplikasi ini. Analisa senario yang diberikan dan jawab soalan.

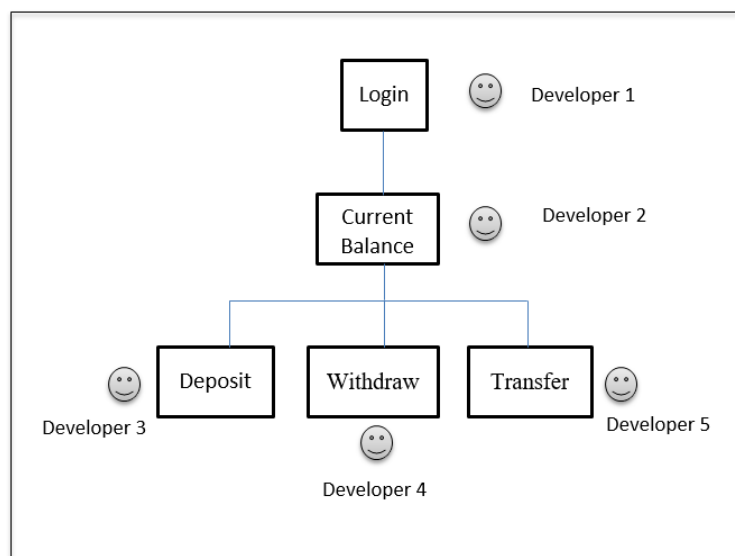


Figure 1: Module breakdown of the banking application
Rajah 1: Pecahan modul untuk aplikasi perbankan

- (a) Developer 2 is ready with the current balance module. Developer 5 is not ready with the transfer module required for you to conduct the integration test between the two modules. What do you do in such situation? Justify your answer.

Pembangun 2 bersedia dengan modul baki semasa. Pembangun 5 belum bersedia dengan modul pemindahan yang diperlukan untuk anda menjalankan ujian integrasi antara kedua-dua modul. Apa yang anda lakukan dalam keadaan seperti itu? Justifikasikan jawapan anda.

(6/100)

- (b) Developer 3 is ready with the deposit module. Developer 2 is not ready with the current balance required for you to conduct the integration test between the two modules. What do you do in such situation? Justify your answer.

Pembangun 3 bersedia dengan modul deposit. Pembangun 2 belum bersedia dengan modul baki semasa yang diperlukan untuk anda menjalankan ujian integrasi antara kedua-dua modul. Apa yang anda lakukan dalam keadaan seperti itu? Justifikasikan jawapan anda.

(6/100)

- (c) Suppose the banking application has successfully passed all the three levels of testing, i.e. unit testing, integration testing and system testing. Can we claim that the software is defect-free? Justify your answer.

Katakan aplikasi perbankan telah berjaya lulus ketiga-tiga peringkat ujian, iaitu ujian unit, ujian integrasi dan pengujian sistem. Bolehkah kita mendakwa bahawa perisian tersebut tanpa kecacatan? Justifikasikan jawapan anda.

(6/100)

3. Consider the following program:

Pertimbangkan program berikut:

```
Public double calculate (int amount)
{
-1-  double rushCharge = 0;
-2-  if (nextday.equals ("yes") )
    {
-3-      rushCharge = 14.50;
    }
-4-  double tax = amount * .0725;
-5-  if (amount >= 1000)
    {
-6-      shipCharge = amount * .06 + rushCharge;
    }
-7-  else if (amount >= 200)
    {
```

```
-8-     shipCharge = amount * .08 + rushCharge;
      }
-9-  else if (amount >= 100)
      {
-10-     shipCharge = 13.25 + rushCharge;
      }
-11-  else if (amount >= 50)
      {
-12-     shipCharge = 9.95 + rushCharge;
      }
-13-  else if (amount >= 25)
      {
-14-     shipCharge = 7.25 + rushCharge;
      }
-15-  else
      {
-16-     shipCharge = 5.25 + rushCharge;
      }
-17-  total = amount + tax + shipCharge;
-18-  return total;
} //end calculate
```

- (a) Draw a control flow graph for the code.

Lukis graf aliran kawalan untuk kod tersebut.

(10/100)

- (b) How many paths should be tested in order to achieve 100% path coverage?

Berapa banyak laluan perlu diuji untuk mencapai 100% liputan laluan?

(2/100)

- (c) Show the traversed paths.

Tunjukkan laluan-laluan yang dilawati.

(6/100)

4. Consider the following requirements:

If you are a new customer opening a credit card account, you will get a 15% discount on all your purchases today. If you are an existing customer and you hold a loyalty card, you get a 10% discount. If you have a coupon, you can get 20% off today (but it can't be used with the 'new customer' discount. Discount amount are added, if applicable.

Pertimbangkan keperluan berikut:

Jika anda seorang pelanggan baru membuka akaun kad kredit, anda akan mendapat diskaun 15% untuk semua pembelian anda hari ini. Jika anda adalah pelanggan yang sedia ada dan anda memegang kad kesetiaan, anda akan mendapat diskaun 10%. Jika anda mempunyai kupon, anda boleh mendapatkan 20% daripada hari ini (tetapi ia tidak boleh digunakan dengan diskaun 'pelanggan baru'. Jumlah diskaun ditambah, jika berkenaan.

- (a) Construct a decision table for this credit card application.

Bina jadual keputusan untuk aplikasi kad kredit ini.

(10/100)

- (b) Derive test cases from the decision table, in a table form as below.

Bina kes ujian dari jadual keputusan, seperti di dalam bentuk jadual di bawah.

Test case number	Input Value	Expected Result
1		
....		

(10/100)

- (c) Describe **two (2)** benefits of decision table testing.

*Jelaskan **dua (2)** faedah ujian jadual keputusan.*

(5/100)

5. During test execution, a test manager describes the following situation to his project team:

"90% of the test cases have been run. 20% of the test cases have identified defects. 127 defects have been found. 112 defects have been fixed and passed confirmation testing. Of the remaining 15 defects, the project manager has confirmed that they are cosmetic defects, and no need to be fixed prior to release."

Semasa pelaksanaan ujian, seorang pengurus ujian menggambarkan keadaan berikut kepada pasukan projek beliau:

"90% daripada kes-kes ujian telah dijalankan. 20% daripada kes-kes ujian itu telah mengenal pasti kecacatan. 127 kecacatan telah dijumpai. 112 kecacatan telah dibetulkan dan telah lulus ujian pengesahan. Daripada baki 15 kecacatan, pengurus projek telah mengesahkan bahawa ianya adalah kecacatan kosmetik, dan tidak perlu dibetulkan sebelum dikeluarkan."

- (a) What can you interpret of this test status report? Name the respective categories of test metrics and justify your answer.

Apa yang anda boleh tafsirkan laporan status ujian ini? Namakan kategori metrik ujian dan justifikasi jawapan anda.

(7/100)

- (b) What would be the best suggestion by the test manager?

Apa yang akan menjadi cadangan yang terbaik oleh pengurus ujian?

(5/100)

- (c) Discuss **four (4)** potential benefits of using tools to support testing.

*Bincangkan **empat (4)** potensi manfaat daripada menggunakan alat-alat untuk menyokong ujian.*

(12/100)