



北京邮电大学

For examiners' use only

EBU6501 A

Joint Programme Examinations 2016/17

EBU6501 Middleware

Paper A

Time allowed 2 hours

Answer ALL questions

1	
2	
3	
4	
5	
6	
7	
8	
Total	

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 Gokop Goteng

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) With regard to the use of Threads in concurrent Java programming, describe with the help of a diagram the FIVE states in which a Thread can be in during its lifecycle

[6 marks]

b) Study the Java code in Figure 1 below and describe what the code is doing at lines **7**, **10** and **12** respectively. Note that the numbers are not part of the code, but just to indicate the line on which each code line is placed in the programme.

[6 marks]

```

1. import java.util.*;
2. public class MySynchronizedYield implements Runnable {
3.     public static void main(String[] args) {
4.         MySynchronizedYield r=new MySynchronizedYield();
5.         Thread t=new Thread(r);
6.         t.start()
7.         synchronized(t) {
8.             try {
9.                 System.out.println("Please wait for me....");
10.                t.wait(100);
11.                System.out.println("Please yield for another....");
12.                t.yield();
13.            } catch (InterruptedException e) { }
14.        }
15.    }
16. }

```

Figure 1: Thread Java Code

[illegible]

Question marking: $\frac{-}{6} + \frac{-}{6} + \frac{-}{5} + \frac{-}{8} = \frac{-}{25}$

Question 2

- a) The Java code shown in Figure 3 below implements the client that contacts the server on host 92.10.8.5 and then receives the response from the server and displays it. Study Figure 3 and then implement the server code which sends the current date to the client. In Figure 3

[10 marks]

```
public class DateClient {

    public static void main(String[] args) throws IOException {

        Socket s = new Socket(92.10.8.5, 9090);

        BufferedReader input =

            new BufferedReader(new InputStreamReader(s.getInputStream()));

        String answer = input.readLine();

        System.out.println(answer);

        return;

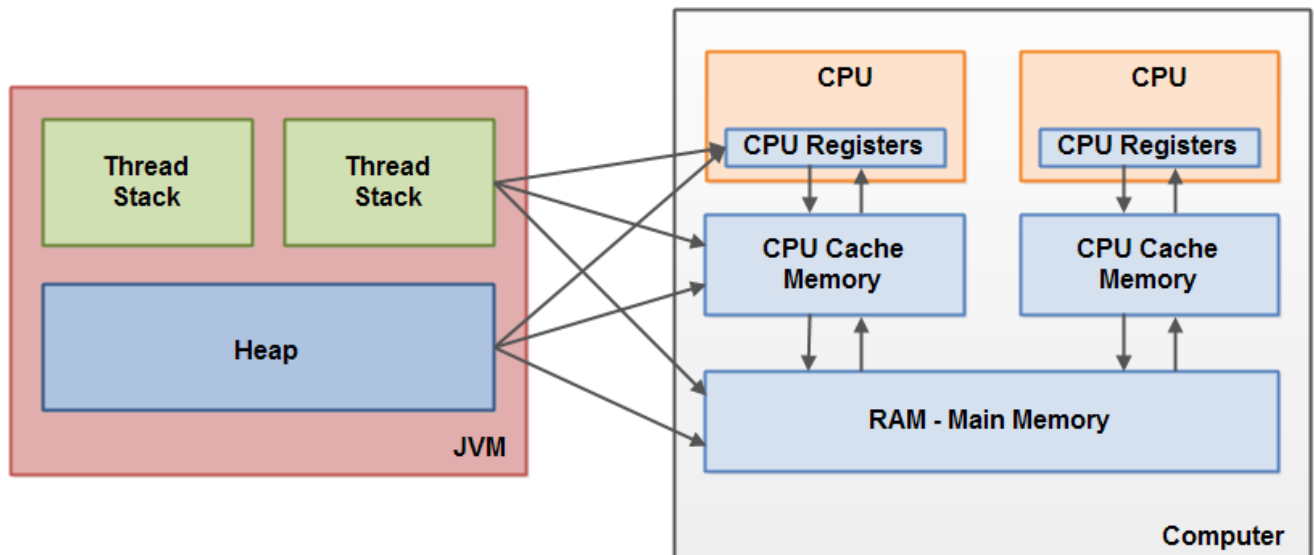
    }

}
```

Figure 3: Java Client Code

- b) Using the diagram of Java Memory model and Computer Memory model as shown in Figure 4 below, describe the TWO problems that will arise when storage of data happens in different memory areas of the computer memory model as Java threads attempt to make changes to the data . Also describe any ONE solution to the problems.

[10 marks]



Question marking: $\frac{1}{10} + \frac{1}{10} + \frac{1}{5} = \frac{1}{2}$

Question 3

a) The Open Services Gateway Initiative (OSGi) is an important part of the J2EE suite. The architecture of OSGi is given in Figure 5 below. Using Figure 5:

[9 marks]

i) List the THREE missing components labelled as **1**, **2** and **3** respectively.

(3 marks)

ii) Briefly explain the functions of the THREE missing components (**1**, **2** and **3**).

(6 marks)

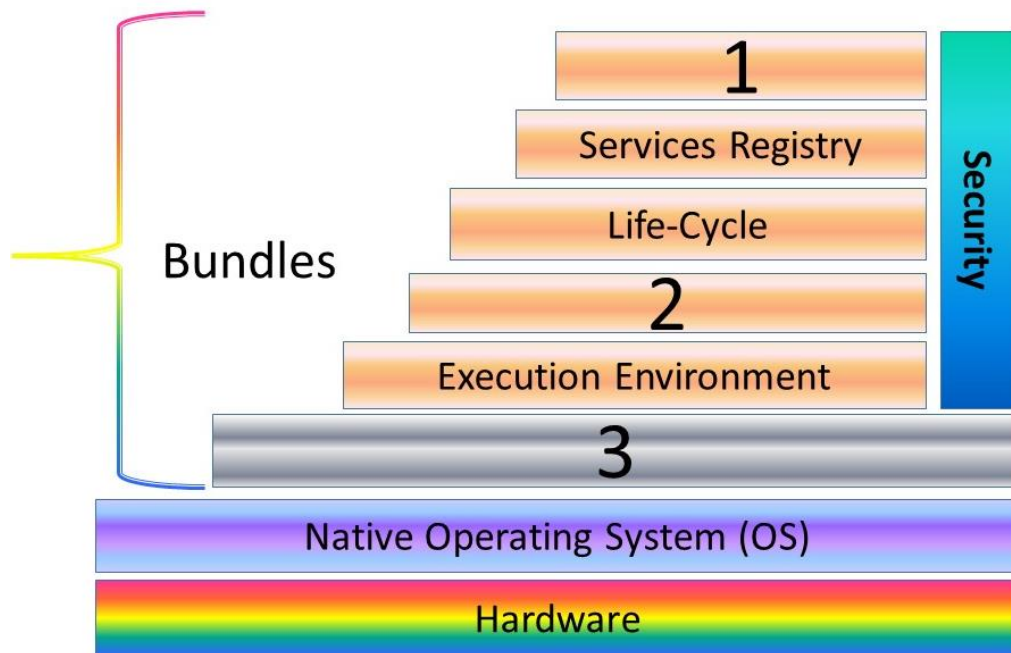


Figure 5: Architecture of OSGi

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