Name: _____ Reg #: _____ Section: _____

National University of Computer and Emerging Sciences, Lahore Campus

Course:	**Advanced Programming**	**Course Code:**	**CS433**
Program:	**BS (Computer Science)**	**Semester:**	**Fall 2018**
Duration:	**60 Minutes**	**Total Marks:**	**23**
Paper Date:	**17-Nov-18**	**Weight**	**15 %**
Section:	**A, B, C**	**Page(s):**	**6**
Exam:	**Mid-II**		

Instruction/Notes: Attempt the examination on the question paper and write concise answers. You can use extra sheet for rough work. Do not attach extra sheets used for rough with the question paper. Don't fill the table titled Questions/Marks.

Question	Objective	1	2	3	4	Total
Marks	/ 5	/ 3	/ 3	/ 7	/5	/ 23

Section 1 (Objective part) [points 5]

Clearly circle the correct options.

Q1. Which statements are incorrect about wait(), notify() and notifyAll()?

(A) It is not important to acquire object lock before calling wait(), notify() and notifyAll().

(B) Threads can communicate with each other by using wait(), notify() and notifyAll() methods.

(C) they are methods of Thread class (D) All are incorrect

Q2. What is a listener in context to event handling?

a) A listener is a variable that is notified when an event occurs.
b) A listener is a object that is notified when an event occurs.
c) A listener is a method that is notified when an event occurs.
d) None of the mentioned

Q3. Which method is used to make main thread to wait for all child threads

a) Join () b) Sleep () c) Wait () d) Stop ()

Q4. Is it possible to convert a normal user thread into a daemon thread after it has been started?

(A) True (B) False (C) depends on nature of the thread (D) depends on its parent thread

Q5. Serialization in RMI is

a) process of servicing RMI requests in an RMI server one at a time

b) conversion of Java datatypes into a sequence of bytes for communication across a network connection

c) batching of RMI requests into series

d) None

Section 2 (Subjective part) (marks 14)

Question No. 1 [3 Marks]

The following code is part of airline booking system that is designed to be used in a single threaded application.

```
public class SeatCounter
{
      private int count = 0;

      public int getSeatCount() {
         return count;
      }

      public void bookSeat() {
         count++;
      }

      public void unBookSeat() {
         count--;
      }
}
```

b) Fix the code so that it works when used with multiple concurrent threads. [mark 1]

a) Describe a potential problem with this code when used with multiple concurrent threads. Provide an example that demonstrates the problem. [marks 2]

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Question No. 2 [3 Marks]

The following Java code executes a simple query. Fill in the blanks.

```
final int div_num = 113;

String sql = "SELECT div_name FROM division WHERE div_num = ?";

_____________.forName("com.mysql.jdbc.Driver");

__________________ conn =
DriverManager.getConnection("jdbc:mysql://localhost/mydb?"+
"user=root&password=root");

_____________________ st = conn.prepareStatement(sql);

st._____________________(1, div_num);

_____________________ rs = st.executeQuery();

while (rs.next()) {

    String div_name = rs._______________________________;

    System.out.println(div_name);
}
```

Question No. 3 [7 Marks] Short Questions

(i) What is the purpose of adapter classes like the MouseAdapter in Java? [1 mark]

Ans:

(ii) Suppose you have 2 threads (Thread-1 on object1 and Thread-2 on object2). Thread-1 is in static synchronized method1(), can Thread-2 enter static synchronized method2() at same time? Explain the reason. [1 mark]

Ans:

(iii) Suppose you have thread and it is in synchronized method and now can thread enter other static synchronized method from that method? Explain the reason. [1 mark]

Ans:

(iv) What is the output of the following code?

public class MultiThreading {
 	
private static class MyThread extends Thread {
 	
public MyThread(String name) {
super(name);
}
public void run() {
System.out.println(Thread.currentThread().getName());
}
}
public static void main(String[] args) {
MyThread myThread = new MyThread("myThread");
myThread.run();
}
}
	Output:

(v) HashMap vs Hashtable **:** Suppose you are implementing a system and you want to choose one of them. [1 mark]

A) If your application is single-threaded, which one is preferable and Why?

B) If your application is multi-threaded, which one is preferable and Why?

(vi) What is difference between PreparedStatement and CallableStatement? Which type of objects (data types) can be returned by PreparedStatement and CallableStatement? [2 marks]

Question No. 4 [5 points] Export Objects over RMI: Suppose FAST is providing a remote service for admin to get the list of students registered in a particular course . The remote service consists of a method with the following signatures: **List<Strudent> getRegisteredStudents (String courseID)**. Answer the following questions:

i) Which classes and interfaces will be implemented by the Service provider (Server)? [0.5 marks]

ii) Which classes and interfaces will be implemented by the admin (client)? [0.5 marks]

iii) Which classes and interfaces will be given (shared) to the client by the server? [0.5 marks]

iv) Write down all the steps to create and run the application successfully. [1 mark]

v) The ---------- class is compiled by ---------- compiler to generate the STUB. [1 mark]

vi) What is the purpose of STUB? [1 mark]

vii) Write the necessary code for interface and implementation: [1.5 marks]

Ans (write necessary code for interface and implementation class here): Assume the data of students is stored in a HashMap.