

**ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)**  
**ORGANISATION OF ISLAMIC COOPERATION (OIC)**

**Department of Computer Science and Engineering (CSE)**

**SEMESTER FINAL EXAMINATION**

**SUMMER SEMESTER, 2018-2019**

**DURATION: 3 Hours**

**FULL MARKS: 150**

**CSE 6255: Advanced Internet Computing**

**Programmable calculators are not allowed. Do not write anything on the question paper.**

There are **7 (seven)** questions. Answer any **5 (five)** of them.

Figures in the right margin indicate marks.

1. Suppose you have to design and implement a web application for community policing service. There are three main features that you have to design. First, the police can send 'alerts' directly to the community, providing important information such as local events, traffic incidents and matters of public safety. Then, users can report selected quality of life and criminal incidents. Finally, the web application provides various forms of municipal information and a link to make emergency calls if necessary.
  - a) What are the Java web technologies suitable to implement the application? Justify your answer. 10
  - b) Draw and explain the J2EE architectural components that you will choose to implement. 12
  - c) Justify that your chosen technology can make the internet communication faster and secure. 8
2. a) Write the differences between JSON and XML. Write the JSON file for the XML file in Figure 1 below. 6+6

```

<artists>
  <artistname>Deep Purple</artistname>
  <formed>1968</formed>
  <albums>
    <album>
      <albumname>Machine Head</albumname>
      <year>1972</year>
      <genre>Rock</genre>
    </album>
    <album>
      <albumname>Stormbringer</albumname>
      <year>1974</year>
      <genre>Rock</genre>
    </album>
  </albums>
</artists>
```

Figure 1: An example XML file

- b) What is XSL transformation or XSLT? How do you perform XML transformation in Java? 10
  - c) Briefly explain the HTTP request and response mechanism with example. 8
3. a) What do you mean by servlet dispatching? Write a servlet to generate a Login page that prompts the user to enter a user name and a password. If both are correct, the user will be redirected to a Welcome page and display user name in the welcome message using *Cookie*. If there is no *Cookie* value set, the user will see the same Login page. 11
  - b) What is Servlet Filter? Write a servlet filter which will display the total response time in the filter. 10
  - c) Write short notes on the followings: 9
    - i. Deployment descriptor
    - ii. Aspect oriented programming
    - iii. Servlet Context

4. a) What is enterprise java bean (EJB)? Explain different types of EJB for developing enterprise solutions. 10
- b) A Java EE container contains three essential components: a web (i.e., Servlet/JSP) container, an EJB container, and a persistence provider. Describe the functionalities of these three components. 12
- c) Write a code snippet that shows the dependency injection of EJB 3.0 from a Servlet. 8
5. a) Consider a simple news Web site. The site consists of three different pages: a page about the site, a news page, and a page to add news. It is assumed the site only needs to be available in HTML format and users do not have to log on before adding news to the site. The site includes header and footer information from separate JSP files. The header page contains title of the site along with required links to navigate. The footer page contains copyright information. For the described application scenario, answer the followings:
  - i. What is Model 1 architecture? 2
  - ii. Draw the Model 1 architecture for the scenario. 5
  - iii. Write the problems may arise if you follow the architecture for the application scenario. 5
  - iv. Redesign the application using Model 2 architecture and provide necessary explanations. 10
- b) How can we avoid direct access of JSP pages from client browser? 8
6. a) What is RMI? Explain how RMI works according to the Figure 2 below. 10

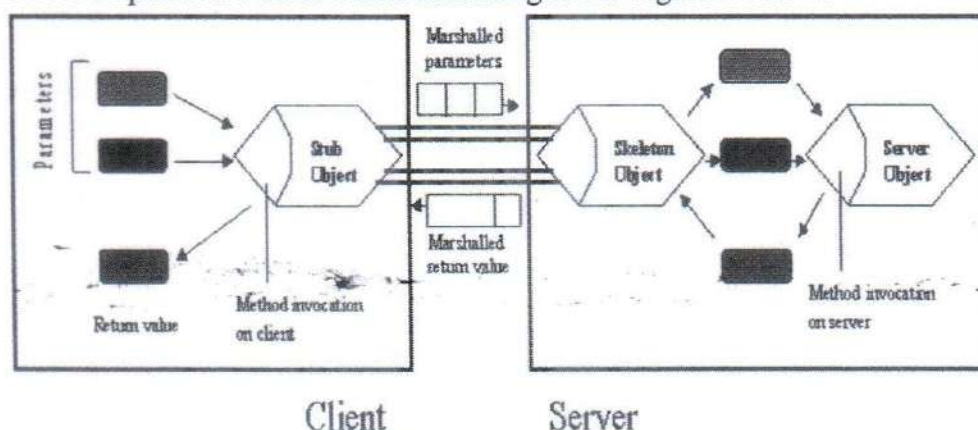


Figure 2: RMI model

- b) Consider a scenario that, there are two applications running in different machines. Let's say MachineA and MachineB; MachineA is located in CountryA and MachineB in CountryB. MachineB want to get list of all the customers of MachineA. Write the code of RMI application implementing the scenario. [Assume required names of the functions and the variables] 15
- c) What is the functionality of naming registry server? 5
7. a) Suppose you have to develop an online Medical Health Record (MHR). The system consists of Java application client through which a user can check his electronic health reports and manage the access credentials of those reports for the other users (e.g. Doctors, Caregiver, Nurse, Consultant etc.) to view, update or edit. Your business logics and information about MHR and access credentials kept in required session beans and separate entities. Draw a diagram to show the façade pattern indicating appropriate entities and session beans. Describe how you will implement the project with different web technologies. [Use code snippets if necessary] 20
- b) What is Web of Things (WoT)? Explain the following WoT architecture taken from W3C shown in Figure 3. 10



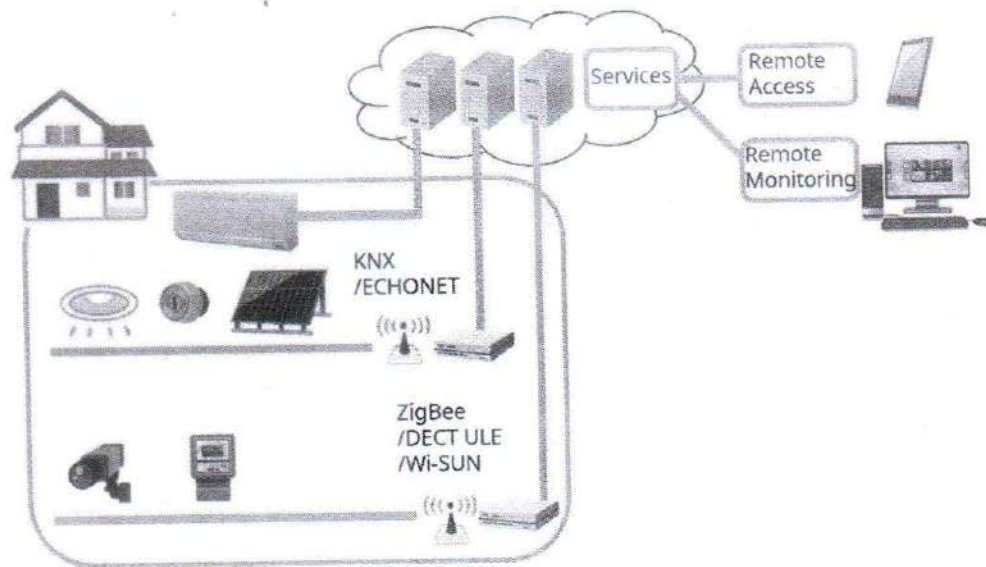


Figure 3: Smart Home