University of Colombo, Sri Lanka

University of Colombo School of Computing

DEGREE OF BACHELOR OF INFORMATION TECHNOLOGY (EXTERNAL)

Academic Year 2021— 2^{nd} Year Examination — Semester 4

IT4206 — Enterprise Application Development

Part 2 - Structured Question Paper

(1 Hour)

To be completed by the candidate							
Index Number							

Important Instructions

- This paper has **two (2) parts**, **Part 1** and **Part 2**.
- The duration of this part (Part 2) is **1 Hour**.
- The medium of instructions and questions is English. Students should answer in the medium of English language only.
- This paper has **2 questions** on **6 pages**. Answer **both** questions.
- This paper consists of 100 marks and all the questions will carry equal marks.
- **Write your answers on and only on the space provided** on this question paper.
- Do not tear off any part of this answer book. Under no circumstances may this book (or any part of this book), used or unused, be removed from the Examination Hall by a candidate.
- Questions appear on both sides of the paper. If a page is not printed, please inform the supervisor/invigilator immediately.
- Any electronic device capable of storing and retrieving text, including electronic dictionaries and mobile phones, are **not allowed**.
- Calculators are **not allowed**.
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To be completed by the examiners

1	
2	
Total	

Index No …….

1) (a) Describe the reasons to use Remote Method Invocation (RMI) in Java application development. Explain with the aid of diagrams.

[10 Marks]

ANSWER IN THIS BOX

If the calling and callee objects are in the **same heap**, JVM knows the where the objects are located and how to communicate with them. If the objects are in **two different JVMs or two different machines RMI is needed**. RMI helps to invoke methods similar way that invoking a method on a local object (explain with diagrams)].

(b) Compare and contract HyperText Transfer Protocol (HTTP) and WebSockets.

[09 Marks]

HTTP - Unidirectional, stateless protocol and use TCP to guarantee the delivery,

For each HTTP request, HTTP header information need to be communicated.

WebSockets - Bidirectional, stateful protocol, Connection between client and

server stays util the it is terminated by one of the parties

(c) List and describe two (2) annotations used in WebSockets

[06 Marks]

@OnOpen - used to annotate the function should called when a new connection is established to the particular endpoint, @OnMessage - used to annotate the functions which handle incoming messages, @OnError - used to annotate a method which handle errors, @OnClose - used to annotate the closing function.

2) (a) Write required XML statements to set up a parameter name "BIT" that has the value "vle.bit.lk" in the deployment descriptor (web.xml). Then, write down the required Java code snippet to access the object using the set-up parameters.

[10 marks]

ANSWER IN THIS BOX

XML Statements

```
<init-param>
        <param-name>BIT</param-name>
        <param-value>vle.bit.lk</param-value>
</init-param>
```

Java code

```
ServletConfig sc = getServletConfig();
sc.getInitParameter("BIT");
```

(b) Write a deployment descriptor for three servlets named “A”, “B”, and “C” that conforms to the following call patterns.

- Servlet A is selected by the container when any request is made for a **.do** extension
- Servlet B is selected by the container when any request is made for **ucsc/classB**
- Servlet C is selected by the container when any request that consists of **ucsc/** followed by any string.

Assume the following

- Servlets are called with the URL: **http://localhost:8080/BIT/<other directives>**
- All servlets are deployed in **lk.ucsc.bit.<servlet name>**

[15 marks]

ANSWER IN THIS BOX

```
<servlet>
        <servlet-name>A</servlet-name>
        <servlet-class>lk.ucsc.bit.A</servlet-class>
</servlet>
<servlet-mapping>
        <servlet-name>A</servlet-name>
        <url-pattern>*.do</url-pattern>
</servlet-mapping>
<servlet>
        <servlet-name>B</servlet-name>
        <servlet-class> lk.ucsc.bit.B</servlet-class>
</servlet>
<servlet-mapping>
        <servlet-name>B</servlet-name>
        <url-pattern>/ucsc/classB</url-pattern>
</servlet-mapping>
<servlet>
        <servlet-name>C</servlet-name>
        <servlet-class>lk.ucsc.bit.C</servlet-class>
</servlet>
```

```
<servlet-mapping>
        <servlet-name>C</servlet-name>
        <url-pattern>/ucsc/*</url-pattern>
</servlet-mapping>
```

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