

**ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)**  
**ORGANISATION OF ISLAMIC COOPERATION (OIC)**  
**Department of Computer Science and Engineering (CSE)**

**MID SEMESTER EXAMINATION****SUMMER SEMESTER, 2018-2019****DURATION: 1 Hour 30 Minutes****FULL MARKS: 75****CSE 6491: Advanced Internet Computing****Programmable calculators are not allowed. Do not write anything on the question paper.**There are **4 (four)** questions. Answer any **3 (three)** of them.

Figures in the right margin indicate marks.

1. a) What are Stateful and Stateless protocols? With examples explain which type of Internet applications require these protocols and why. 10
- b) Suppose you are asked to construct a web application (web app) where chunks of data transferred from the server to the client are minimal. It is very agile, responsive, lightweight, highly interactive web app that can be easily transformed into a mobile app. For this application, which web application model would be suitable? Provide enough justification of your chosen web model including the implementation technologies you are going to use. Draw the web application model. 15
2. a) Are there documents that are both HTML and XHTML documents? Is every HTML document also an XHTML document? Is every XHTML document also an HTML document? Explain. 6
- b) Consider the BookML in Figure 1, as an example XML document:

```
<?xml version="1.0" standalone="yes"?>
<!DOCTYPE books SYSTEM "books.dtd">
<books>
  <book status="In Print">
    <title>Internet Application Architecture</title>
    <subtitle>Principles, protocols and practices</subtitle>
    <author firstName="X" lastName="Y"/>
    <author firstName="P" lastName="Q"/>
    <info>
      <pages count="500"/>
      <price usd="45" bp="27.50"/>
      <publication year="2011" source="&jw;"/>
    </info>
    <summary> An in-depth examination of the basic concepts and general
      principles associated with Web application development.
    </summary>
  </book>
  <!--<book><TBD>
</book> -->
  <notes><![CDATA[
    &lt;!-- This is our CDATA example that hides syntactically
    incorrect comments and XML fragments -->
  </notes>
</books>
```

Figure 1: An example XML document

Answer the followings:

- i. Define an XML DTD externally for this BookML named, 'books.dtd', 9
- ii. Write an XSL file to display only book title and price for which the year of publication is greater than 2009. 10

3. a) The Model-View-Controller paradigm provides separation of content from presentation, which means that the same model can be presented using many different views. Why does application might require multiple views? Explain. 10
- b) What is session tracking? Show a simple servlet that uses session tracking to count the number of times a client has accessed a web page. 10
- c) When a client request is sent to the servlet container, how does the container choose which servlet to invoke? Explain. 5
4. a) Consider a set of servlets that sell 'Pizza' and share a chef's special pizza of the day. The administrative servlet sets the special of the day (e.g. Name of special pizza and date). Other servlets on the server can access the special pizza and display the message, 'Our special pizza on '26 August, Monday' is 'Pizza di Kampala'.  
Write two collaborative servlets (Administrative servlet named, 'SpecialSetter' and other servlet named 'SpecialGetter') for the scenario described above. Is it possible to collaborate with servlets from other web context? Explain. 15
- b) Demonstrate with an example implementation of the web application Model-2 using JSP and JavaBean technologies. 10