

ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)

ORGANISATION OF ISLAMIC COOPERATION (OIC)

Department of Computer Science and Engineering (CSE)

MID SEMESTER EXAMINATION

SUMMER SEMESTER, 2021-2022

DURATION: 1 HOUR 30 MINUTES

FULL MARKS: 75

CSE 4635: Web Architecture

Programmable calculators are not allowed. Do not write anything on the question paper.
Answer **all 3 (three)** questions. Figures in the right margin indicate full marks of questions whereas corresponding CO and PO are written within parentheses.

1. a) What is a URI and a URL? What are the major components of a URL? Explain with examples. 5
(CO1)
(PO1)
- b) "HTTP is a stateless protocol, but it allows stateful sessions" – Explain with an example. 7
(CO1)
(PO1)
- c) ABC is a new bank in Bangladesh and its target customers are villagers in rural areas of the country. It wants to develop a web application to handle its operations and functions. To make things easier for the rural people, it decided to allow opening of bank accounts if a customer has a phone number. The bank has also decided that it will allow multiple customers to share the same account, and at the same time it will allow a customer to open multiple accounts. The application will contain typical features like checking balance, transferring funds, loan schemes, etc. ABC also wants to introduce a feature through which customers will be able to view information about different package offers from the bank. Aside from these features, the bank wants the application to be developed in a way that it can be scaled in the future. They want enhanced security and availability of their application based on the requirements they gather after proper consultation.
Based on the scenario, answer the following questions: 10+3
(CO3)
(PO3)
- i. Suppose you are currently working on the Login and Authentication system. Assuming there is a login page that takes username, phone number, and password as input, create the corresponding **servlet**, **filter**, and **web.xml** files (all with code) to handle the login and authentication system. You can assume any constant value for the username, phone number, and password to verify a user.
- ii. Assume that you want to show the username of the current logged in user on every page of your web application. Instead of hardcoding a line of code on every single page of your application to show the username, how would you do it in a 'reusable code' fashion? Explain.
2. a) i. When should you initialize a **RequestDispatcher** object using **ServletContext** interface VS **ServletRequest** interface? 2+2
(CO1)
(PO1)
- ii. What are the major differences between **sendRedirect()** method and **forward()** method? Explain.
- b) Considering the requirements of the scenario mentioned in Question 1.c) which architecture would you choose to develop the application? Explain your reasoning. Create a rough architectural diagram showing the placement of all the components of your application in your chosen architecture. 8
(CO2)
(PO2)

- c) Suppose you are using XML technology to store the product stock information of wholesale dealers. Each entry includes:
- A unique Dealer ID (mandatory)
 - Name of Dealer
 - A date of establishment (one or none)
 - Address of wholesale dealer (one or more)
 - A list of items sold by the Dealer, giving code number (mandatory), description or category ('description' is used for non-perishable items, 'category' is used for perishable items), quantity stored, and price for each item.
 - An entity defining the contact number of the Dealer

6+4
(CO3)
(PO3)

Now, answer the following questions:

- i. Create a DTD according to the requirements of the above-mentioned document.

- ii. A Dealer's information is as follows:

Dealer ID: abxyz23

Dealer Name: Bhai Bhai Dealers

Date of establishment:

Address: Dhaka, Bangladesh

Address: Chittagong, Bangladesh

Item Code: 05; Description: Food packaging; Quantity: 50; Price: 200/- each

Item Code: 19; Category: Food (chocolate); Quantity: 100; Price: 400/- each

Email: john@abc.xyz

Construct this order as an XML document, conforming to the DTD you created earlier.

3. a) i. What are the major components of a request message and a response message? Explain.

6+6
(CO1)
(PO1)

- ii. Briefly write about JSP scriptlets, expressions, and declarations, highlighting their differences.

- b) Give examples of two scenarios where you would use `<%@include%>` and `<jsp:include>` to include additional resources in your web application.

4
(CO1)
(PO1)

- c) i. Using the technologies you have learnt so far (Servlets, Filters, JSPs, JavaBeans, etc.), for the application mentioned in 1(c), explain which technology you would use to develop each feature of the application. You do not have to write any code.

8
(CO2)
(PO2)

- ii. Create an architectural diagram of your application using Model-2 architecture, showing the placements of your components in the architecture.

4
(CO3)
(PO3)