

ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)**ORGANISATION OF ISLAMIC COOPERATION (OIC)****Department of Computer Science and Engineering (CSE)****MID SEMESTER EXAMINATION****SUMMER SEMESTER, 2019-2020****DURATION: 1 HOUR 30 MINUTES****FULL MARKS: 75****CSE 4635: Web Architecture****Conform to the rules of the examination. Violation of any of the rules may result in termination.**There are **3 (three)** questions. Answer all of them.

Figures in the right margin indicate marks.

1.	a)	What do you understand by availability and scalability? Which architectural model is the best to consider for availability and scalability of a web application? Explain your reasoning.	2+3
	b)	Explain the construction of request and response messages. What are the main differences between request and response messages?	2+2+4
	c)	What is the main purpose of the header lines sent in request and response messages? Are there any differences between the header lines of request and response messages? Explain.	4
	d)	HTTP is a stateless protocol, but it allows stateful sessions – Explain.	8
2.		<p>The manager of a local grocery store has hired you to design a web application that would allow customers to navigate through the content of the store and purchase items. After consulting with the manager, you have identified the following requirements:</p> <ul style="list-style-type: none"> • Customers should be able to login or sign up when they visit the store's website. • Customers should be able to navigate through the store items, add items to cart and check out. • Customers can use the following forms of payment: bKash, Card or Cash on Delivery • There will be a Store Admin who will be able to login into the website. His login is separate from that of the customers. • The Store Admin will be able to add or remove items from stock, change the price of commodities and manage the inventory items in general. 	
	a)	Which architectural model will you use to design the web application and why? Draw the appropriate web architecture diagram to design the application and explain your design. Your diagram should clearly indicate which component should reside where in your proposed model.	2+10
	b)	You have decided to use both XML and HTML when developing your web application. Now, write down some of the differences between XML and HTML.	3
	c)	<p>For the web application, you have decided to use XML technologies to design the invoices of the purchases made by customers. Each invoice includes:</p> <ul style="list-style-type: none"> • A unique invoice number • A date of purchase • A billing address • A delivery address, if different from the billing address • Name of customer • A list of items giving code number, description or category ('description' is used for non-perishable items, 'category' is used for perishable items), quantity ordered, price and amount due for each item in the invoice. • Total weight of items in kg <p>Now, answer the following questions:</p>	
	i.	Create a DTD according to the requirements of this document. Your DTD should	6

		also contain an entity defining the email id of the customer.	
	ii.	<p>A customer made the following purchase:</p> <p>Name of customer: Mr. John; Email: john@abc.xyz Delivery address: House number 3 Date: 18th November, 2020 Item ID: 02; Description: Mouse pad; Quantity: 3; Price: 300/- each Item ID: 19; Category: Food (chocolate); Quantity: 5; Price: 150/- each Weight: 0.6 kg</p> <p>Produce this order in XML, conforming to the DTD you have defined earlier.</p>	4
3.		<p>You are an entrepreneur who has decided to develop a next gen photo sharing platform for Bangladesh, called 'Banglagram'. You are in the very early stages of your application design, and so far, you have come up with the following requirements:</p> <ul style="list-style-type: none"> • A secure registration and session management system for your users • The main feed of the application will contain two tabs, one for viewing photos shared in your own state or region (e.g. Dhaka, Chittagong etc.) and the other for viewing photos shared across any and all regions • There will be a search bar on all pages that will allow users to search for specific accounts and follow them • The username of the currently logged in user should be present at the top of every page, and beside the username, there should be a Logout button that will allow the user to logout any time he/she wants. 	
	a)	Assume that you are using the Model 2 architecture to design your web application. Now, which Java technologies are suitable to implement the different components of the web application mentioned above and where should each component lie in the said architecture? Justify your answer.	10
	b)	Describe how you have ensured the concept of 'separation of concerns' through your architectural design solution.	5
	c)	How will you implement the search bar functionality i.e. how will you ensure the presence of a search bar on every page? Explain your idea with a sample block of code.	5
	d)	Create a diagram to show the several stages of the lifecycle of JSP. What are the main lifecycle methods of JSP?	5