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Lab Manual - IT5026 - Fundamentals of Web Application Development - 2022-23

Enrollment No:	Student Name:

Sr. No.	Practical Title	Page No	Submission Date	Evaluation		Teacher's Signature with Date
				Practical	Viva	
1.	Basic servlet problems.					
2.	State management in Servlet.					
3.						
4.						
5.						
6.						

5 - Years Integrated M.Sc. (IT)/B.Sc. (IT) (Semester – 6)
Lab Manual
IT5026 - Fundamentals of Web Application Development

Course Credits: 04	Total Hours: 48	[Lectures: 04, Tutorial: 00, Practical: 03]
Prerequisites:	Web Designing and Developing, Database Management System	
Prerequisites By Topics	Client-side and Server-side Programming Languages, HTTP Request and Response, Normalization, Responsive Web Design, Data Parsing	
Course Objectives:	To introduce concepts of dynamic web applications to design, develop and deploy such an application through the utilization of middleware technologies.	
Programme Outcomes:	• PO1: Knowledge: Apply the fundamental knowledge of information technology along with analytical, problem-solving and designing. Also to provide communication skill for life-long learning in chosen field. • PO2: Problem Analysis and Solution: Identify, Analyse and provide the solution for emerging real world problems with the help of theoretical and practical understanding of tools and technologies. • PO3: Core Competence: To cultivate professionalism, ethics, and aesthetic to become competent leader to serve the community. • PO4: Preparation: To Prepare the student for higher studies, research and development and social upliftment. Also to provides skills which help students to work and recognized themselves as an individual and as a team player.	

Course Outcomes:

CO1	Classify the nature of web applications with its configuration protocol.
CO2	Describe the web container life cycle and client-server communication techniques for web applications.
CO3	Analyse the needs and usage of connection pooling in web data management, concept of debugging, and custom error handling.
CO4	Implement authentication in web application using filter, role based, and session-based security.
CO5	Demonstrate the usage of cross-platform scripting, mail transfer protocol and payment gateway.
CO6	Construct and deploy web services to exchange semi-structured and unstructured data on various platforms.

Practical - Course Outcomes Mapping:

P#	Practical Title	CO1	CO2	CO3	CO4	CO5	CO6
P1	Basic servlet problems.	✓	✓				
P2	State management in Servlet.		✓				

Practical Guidelines for students:

1. Student must prepare handwritten journal which contain the solution of a practical problems on A4 size blank paper.
2. Each page must contain enrollment number, page number and margin.
3. Student should obtain signature on completed practical during laboratory from the lab teacher.
4. Journal must be neat and clean.
5. Student must carry journal during lab sessions.
6. Students shall do programming and developing website in Java Servlet, JSP and ASP .NET C# programming language using IDEs like Eclipse, NetBeans for Java and Visual Studio 2019 for C# programming.
7. Proposed solution must be done by students, don't copy the solution for internet resources.

Practical Guidelines for teachers:

1. Lab teacher has to check completed practical and journal time to time during lab hour.
2. Lab teacher must solve the doubts raised by the students during lab hours.
3. As a part of Continues Internal Evaluation (CIE) scheme, do time to time evaluation of journal and conduct practical exam during semester.

Tools and Technologies:

1. Eclipse
2. NetBeans
3. MySQL
4. Visual studio 2019
5. SQL Server

Computing Environment:

1. **Processor:** Intel® Core™ i5 Processors
2. **Memory:** 16 GB / 12 GB
3. **Operating System:** ubuntu 18.04, Windows 10

Resources:

1. Marty Hall, Larry Brown - Core Servlets and Java Server Pages Volume – 1, Pearson Education
2. Matthew MacDonald - Pro ASP.NET 4 in C# 2010, Apress

Practical No. 1	**Enrollment No:**
Objectives	To make aware of the concept of servlet for web development.
Pre-requisite	Basics of HTML and web development, Concepts of core java and object-oriented programming
Duration for completion	8 Hours
Practical Problems	1. Write a servlet code to print "Hello Java Servlet" on browser. 2. Write a program to create a servlet to demonstrate Servlet Life Cycle. 3. Write a servlet program to display current date and time on browser. 4. Write a program to create a servlet to demonstrate form processing (Student Information). Take information from html form and display on browser window. 5. Create a simple calculator application using servlet. 6. Create a servlet for a user login functionality. If the username and password are correct then display message "Hello" else display message "Please provide valid username or password". Consider static username and password i.e. "user1" as username and password. 7. Create registration page for job portal and show detail on next page after click on "Submit" button. (use all the html form controls) (keep minimum 10 fields for registration form). 8. Design Student feedback form with enrolment number, full name, password, confirm password, semester, division, subject name, faculty name, and feedback description. On a click of "Submit" button, show all the details on browser. Also perform the following validations while submitting the form. a. Password and compare password must be same b. All fields are mandatory. c. Division field conations only one character.
PEO(s) to be achieved	PEO2: To provide quality practical skill of tools and technologies to solve industry problems.
PO(s) to be achieved	PO6: Ability to use the techniques, skills and modern tools as necessary for software development.
CO(s) to be achieved	CO1: Classify the nature of web applications with its configuration protocol. CO2: Describe the web container life cycle and client-server communication techniques for web applications.
Solution must contain	Java Servlet code.
Nature of submission	Handwritten
Reference	Marty Hall, Larry Brown - Core Servlets and Java Server Pages Volume – 1, Pearson Education

Technical questions for Viva	1. What is CGI? 2. What is Web Application? 3. What is the purpose of web container? 4. What is the purpose of web.xml file? 5. Why servlet is advantageous over CGI?

Practical No. 2	**Enrollment No:**
Objectives	To aware about the basic concept of state management in JSP servlet.
Pre-requisite	Basics of servlet and jsp and understanding of state management techniques.
Duration for completion	8 Hours
Practical Problems	1. Write a code to store the username in cookie. Also, retrieve and display the cookie value on next page. 2. Write a code to store the username in session. Also, retrieve and display the "Welcome <<username>>" on profile page. 3. Write a code to implement "Logout" functionality. After logout don't allow user to visit profile page directly. 4. Create a web application that takes a name as input and on submit it shows a "Hello <<name>>" on page where name is taken from the session. Put a logout button on the top left corner. On clicking logout button, it should show a logout page with "Thank You <<name >> message. 5. Create an application that takes username and password. If the user checks the checkbox of REMEMBER then save it to cookie. 6. Design a JAVA Servlet Program to implement RequestDispatcher object using include( ) and forward( ) methods. 7. Write code using RequestDispatcher Interface to create a Servlet which will validate the password entered by the user, if the user has entered "java" as password, then he will be forwarded to profile Servlet else the user will stay on the index.html page and an appropriate error message will be displayed.
PEO(s) to be achieved	PEO2: To provide quality practical skill of tools and technologies to solve industry problems.
PO(s) to be achieved	PO6: Ability to use the techniques, skills and modern tools as necessary for software development.
CO(s) to be achieved	CO2: Describe the web container life cycle and client-server communication techniques for web applications.
Solution must contain	Java Servlet code.
Nature of submission	Handwritten
Reference	Marty Hall, Larry Brown - Core Servlets and Java Server Pages Volume – 1, Pearson Education
Technical questions for Viva	1. What do you mean by state management in web development? 2. What is the significance of state management? 3. List different types of state management techniques. 4. What is the purpose forward( ) and include( )? 5. Differentiate between forward( ) and include( ) method of RequestDispatcher interface.

Practical No. 3	**Enrollment No:**
Objectives	Develop a system module with CRUD operation in JSP and ASP.NET technologies.
Pre-requisite	Basics of servlet, jsp and ASP.NET with understanding of state management techniques and database connectivity.
Duration for completion	8 Hours
Practical Problems	1. Develop a complete system where student has to develop a user management module. You have to create Registration, Login and state management with session and cookie management. Develop a module where you have to implement CRUD operations.
PEO(s) to be achieved	PEO2: To provide quality practical skill of tools and technologies to solve industry problems.
PO(s) to be achieved	PO6: Ability to use the techniques, skills and modern tools as necessary for software development.
CO(s) to be achieved	CO1 Classify the nature of web applications with its configuration protocol. CO2 Describe the web container life cycle and client-server communication techniques for web applications. CO3 Analyse the needs and usage of connection pooling in web data management, concept of debugging, and custom error handling. CO4 Implement authentication in web application using filter, role based, and session-based security. CO5 Demonstrate the usage of cross-platform scripting, mail transfer protocol and payment gateway. CO6 Construct and deploy web services to exchange semi-structured and unstructured data on various platforms.
Solution must contain	JSP and ASP .NET code.
Nature of submission	-
Reference	-