Course Code	**:**	**BCS-053**
Course Title	**:**	**Web Programming**
Assignment Number	**:**	**BCA (V)053/Assignment/2026-27**
Maximum Marks	**:**	**100**
Last Date of Submission	**:**	**31st October, 2026 (For July 2026 Session)**
	:	**30th April, 2027 (For January 2027 Session)**

This assignment has two questions of 80 marks. Answer all the questions. Rest 20 marks are for viva voce. You may use illustrations and diagrams to enhance explanations. Please go through the guidelines regarding assignments given in the Programme Guide for the format of the presentation. Please give precise answers. The word limit for each part is 300 words.

Q1: (Covers Block 1)

a) Explain the features of the following in the context of Web 2.0: Blogging, Rich Internet Applications and Data Streaming. How are these technologies useful? **(6 Marks)**

b) (i) Create an online Library membership form for a University using HTML. The form should ask for the following information: (**3 Marks**)

- The Student Name
- The Enrolment Number of the Student
- Membership Type (Choose only one membership type from a drop-down list containing Daily User, Occasional User, and Research Scholar)
- Membership Fee
- Were you a member earlier? (Yes/No)
- What services do you need from the library (list at least four services and allow students to select as many as they like)
- A SUBMIT button

(ii) Create an external CSS file for this form. This CSS file should set the font size to 14-point Bold for all labels; headings should be Dark Brown, and the normal text should be dark blue. The background colour of the form should be light green. **(2 Marks)**

(iii) Write JavaScript code to validate if any of the field of the form is not filled. **(3 Marks)**

Submit the HTML code, JavaScript code and screenshot of the form opened in a browser window. You must demonstrate the form and its validations at the time of the viva.

c) Using tables, create a webpage that displays the list of medicines available at a pharmacy. This webpage should display the medicine code, the medicine name, the unit price, and the expiry date. Create a second page that displays a customer's medicine orders, showing the medicine code,

medicine name, unit price, and ordered quantity. You should use tags, wherever needed, and create an internal CSS file, which formats the web pages as given below:

(i) The table headings must be in 12-point Bold, and all other content should be in 10-point Arial.

(ii) The table heading should be in a different colour. The shades of the data rows in the table should alternate between light blue and light grey. The table background should be light yellow.

(iii) The font of the ordered list should be "Arial", and the font size should be 10 points. The background colour of the list should be light green.

(iv) At the time of the viva, you should demonstrate how changes in CSS can change the display.

You must submit the HTML and CSS code, along with screenshots of the pages in a browser window. **(6 Marks)**

d) A University maintains the list of Students using XML. Every Student is allotted a unique Student Number, which should be used as an attribute in the XML document. In addition, the following information is stored for each student: Name, Programme, courses (a list of at least 1 and up to 5 courses for each student), and year of registration. Create an XML document containing information about five students. Also, create a DTD to validate the XML document created by you. **(8 Marks)**

e) A webpage displays the text **"Welcome to IGNOU"**. Write a JavaScript program that changes the displayed text to **"Welcome to BCA"** when the user moves the mouse pointer over the text. You may use event handling to perform the action as stated above. Make suitable assumptions, if any. Submit the code. You should demonstrate this code during the viva. **(6 Marks)**

f) Explain the working of the WAP model. Also, explain the following WML elements with the help of an example of each:

- WML <input> element
- WML <select> element
- WML <optgroup> element

(6 Marks)

Q2: (Covers Block 2) **(10×4=40 Marks)**

a) Explain the following with the help of a diagram/example, if needed:

(i) Tools for Server-side scripting

(ii) N-Tier Architecture

(iii) MVC Architecture

(iv) Request and Response Primitives of HTTP

(v) Use of Web Containers

b) Answer the following questions:

(i) Explain the JSP life cycle with the help of a diagram

(ii) Write a JSP scriptlet to display a list of the first 10 odd numbers.

(iii) Explain the use of any two action elements of JSP with the help of an example of each.

(iv) Explain the *config* and *exception* implicit objects in JSP with the help of an example of each.

c) Write JSP programs which can perform the following tasks (you may create a single or multiple webpages for these tasks):

(i) Write a JSP code to create a simple web page that accepts user input for three variables, namely Name, Marks1 and Marks2. After receiving valid input in these variables, the JSP program should display the entered Name and the sum of Marks1 and Marks2.

(ii) Create a web page that takes input in two fields, namely the username and password, in a login form. If the data is correctly entered in both fields (verified by JavaScript), create two cookies - one each for the username and password. Make suitable assumptions, if any.

d) Create a database for the Student Result System consisting of the following two tables:

Student (StudentID, StudentName, Programme

Results (StudentID, CourseCode, MarksObtained)

Develop and deploy a web-based "Student Result System" using JSP, with a database backend and a web server (you may select the DBMS and web server of your choice). Your system should use JDBC to insert data into both tables. The system should also allow a student to query her/his results. Please note that a student's results will be available in many courses.

Submit the JSP program, the system screens, and the system's database. You must demonstrate this system at the time of viva voce.

Make and state suitable assumptions, if any.

Q1: (Covers Block 1)

a) Explain the features of the following in the context of Web 2.0: Blogging, Rich Internet Applications and Data Streaming. How are these technologies useful? (6 Marks)

Answer

Blogging is a Web 2.0 publishing facility in which a user can regularly post articles, opinions, news, images or links. Posts normally appear in reverse chronological order and readers can comment, subscribe through feeds and share entries. It changed the Web from a mainly read-only medium into a participative one. Blogs are useful for personal publishing, teaching, product updates, technical support and organisational communication.

Rich Internet Applications (RIAs) provide an interactive interface in the browser with behaviour similar to desktop software. They use technologies such as HTML, CSS, JavaScript, AJAX and browser APIs to update only the required part of a page instead of reloading the complete page. RIAs give faster feedback, drag-and-drop operations, validation and responsive interfaces. Online mail, maps, dashboards and shopping applications are common examples.

Data streaming transfers audio, video or other continuous data so that it can be consumed while it is being received rather than waiting for the complete file to download. Streaming can be live or on-demand and normally uses buffering to handle short network variations. It is useful for online classes, webinars, music, live events, video-on-demand and real-time information feeds. Together, these technologies support participation, interactivity and continuous multimedia delivery, which are important features of Web 2.0 applications.