

**WEB TECHNOLOGY  
(MCA2102)**

**Time Allotted : 2½ hrs**

**Full Marks : 60**

*Figures out of the right margin indicate full marks.*

*Candidates are required to answer Group A and any 4 (four) from Group B to E, taking one from each group.*

*Candidates are required to give answer in their own words as far as practicable.*

**Group – A**

1. Answer any twelve:

**12 × 1 = 12**

*Choose the correct alternative for the following*

- (i) The 'pattern' attribute works with which of the following HTML form input types?  
(a) button (b) email  
(c) checkbox (d) radio
- (ii) Which attribute specifies a unique alphanumeric identifier to be associated with an element?  
(a) type (b) class  
(c) id (d) name
- (iii) What is the default value of the CSS property 'background-repeat'?  
(a) repeat (b) no-repeat  
(c) repeat-x (d) repeat-y
- (iv) Which of the following statements is false?  
(a) XML documents must have a root element  
(b) All XML elements must have a closing tag  
(c) XML attribute values must always be quoted  
(d) XML tags are not case sensitive
- (v) Which of the following statements about XML DTD is false?  
(a) Namespaces are not supported  
(b) Large number of built-in data types  
(c) No new data types can be created  
(d) Cannot put restrictions on text content
- (vi) What could be the reason for the HTTP status code 302?  
(a) The requested resource has been temporarily moved to a different URL  
(b) The requested resource is available only through a proxy  
(c) The server timed out waiting for the request  
(d) The server does not support the HTTP version used in the request

- (vii) What is the output from the following JavaScript code?  
`<script>document.write(1 + 2 + '3' + 4 + 5);</script>`  
 (a) 12345 (b) 3345  
 (c) 339 (d) 15
- (viii) What is the correct way to include the file "demo.inc" in PHP?  
 (a) `<!-- include file="demo.inc" -->` (b) `<?php include "demo.inc"; ?>`  
 (c) `<?php include:"demo.inc"; ?>` (d) `<?php include file="demo.inc"; ?>`
- (ix) Which PHP super global variable is not used to collect data after submitting an HTML form?  
 (a) `$_COLLECT` (b) `$_POST`  
 (c) `$_GET` (d) `$_REQUEST`
- (x) The default mode for a PDO fetch statement is  
 (a) `FETCH_BOTH` (b) `FETCH_ASSOC`  
 (c) `FETCH_NUM` (d) `FETCH_OBJ`

*Fill in the blanks with the correct word*

- (xi) The JavaScript String method that matches a string against a regular expression and returns the position of the first match is \_\_\_\_\_.
- (xii) The pseudo-element used to add a special style to the first line of a text is \_\_\_\_\_.
- (xiii) HTTP status code \_\_\_\_\_ indicates that the server cannot or will not process the request due to a client error.
- (xiv) The attribute used to define a new namespace in XML is \_\_\_\_\_.
- (xv) Front-end coding involves HTML, CSS, \_\_\_\_\_ and related frameworks, libraries and tools.

## Group - B

2. (a) Describe the components of 3-tier architecture for web applications. [[CO1](Understand/LOCQ)]
- (b) Design an HTML survey form that includes the following components: A multiple-choice question about user satisfaction with rating options from 1 to 4, a checkbox question asking users to select their preferred features from at least three options, a comment section for additional feedback and a Submit button. Add basic HTML validation attributes to ensure that: the user selects one rating and at least one preferred feature. The comment section is optional. [[CO3](Apply/IOCQ)]
- 6 + 6 = 12**
3. (a) Explain the purpose of the `<!DOCTYPE>` declaration in an HTML document. Why is it important? [[CO3](Understand/LOCQ)]
- (b) Describe the role of storyboarding in website development. [[CO2](Understand/LOCQ)]
- (c) Design an HTML form for student registration using suitable types of input elements for user name, password, phone number, email id, date of birth, gender and provisions for submit and reset. Add basic HTML validation attributes to

ensure that none of the fields is empty, username accepts alphanumeric characters only, phone number accepts exactly 10 digits and email id is in a valid email format.

*[[CO3](Apply/IOCQ)]*

**2 + 3 + 7 = 12**

### **Group - C**

4. (a) What are pseudo classes in CSS? Explain any three of them with relevant examples. *[[CO3](Understand/LOCQ)]*
- (b) Create a CSS class to style buttons with a gradient background that changes colour when hovered over. *[[CO3](Apply/IOCQ)]*
- (c) Design an XML Schema (XSD) for a 'book' element in a digital library system. Each book must include the following: 'title' (with a minimum of 3 and a maximum of 100 characters), 'isbn' (a 13 character string), 'price' (less than or equal to 999.99) and 'publishDate'. *[[CO5](Apply/IOCQ)]*
- 4 + 3 + 5 = 12**
5. (a) Write CSS to implement a fixed header at the top of a page that remains visible during scrolling. *[[CO3](Apply/IOCQ)]*
- (b) Explain the role of the 'xmlns' attribute in XML with suitable examples. *[[CO5](Understand/LOCQ)]*
- (c) Compare and contrast between HTML and XML. *[[CO5](Analyse/IOCQ)]*
- 3 + 4 + 5 = 12**

### **Group - D**

6. (a) What is meant by 'statelessness' in the context of HTTP, and what is its importance? *[[CO1](Understand/LOCQ)]*
- (b) Describe the purpose served by HTTP status codes. *[[CO1](Understand/LOCQ)]*
- (c) Create a JavaScript function to validate a student registration form containing first name, last name and password. None of the fields, except last name, can be empty. First name and last name (if present) will be consisting of alphabets only. Password length will be at least 8 characters, containing alphabets and at least one digit. *[[CO4](Apply/IOCQ)]*
- 3 + 2 + 7 = 12**
7. (a) Compare and contrast an HTMLCollection and a NodeList. *[[CO4](Analyse/IOCQ)]*
- (b) With relevant examples, explain the 'splice()' method of JavaScript array. *[[CO4](Understand/LOCQ)]*
- (c) Design a JavaScript function `insertIntoArray(arr, val, n)` that receives an array 'arr', a value 'val', and an integer 'n' and returns an array with the value inserted at every nth position. *[[CO4](Apply/IOCQ)]*
- 4 + 4 + 4 = 12**

## Group - E

8. (a) Explain the role of the PHP 'header()' function in redirecting a user to another page. *[[CO6](Understand/LOCQ)]*
- (b) Explain the difference between \$\_GET, \$\_POST, and \$\_REQUEST in PHP. *[[CO6](Understand/IOCQ)]*
- (c) How can you use regular expressions in PHP to validate
- (i) a mobile number that starts with 7, 8, or 9 and is exactly 10 digits long
- (ii) an Indian PAN (Permanent Account Number) in the format: ABCDE1234F *[[CO6](Apply/IOCQ)]*
- 4 + 4 + 4 = 12**
9. Create a web application using PHP to take choice of subjects from students for MCA 3<sup>rd</sup> semester elective papers. Students can opt for one of the following four papers: Image Processing, Computer Graphics, Data Science, and Software Project Management. Provide functionality to query the database to know how many students have opted for a particular elective paper. [Use PDO for database connectivity]. *[[CO6](Create/HOCQ)]*

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Cognition Level	LOCQ	IOCQ	HOCQ
Percentage distribution	33.33	54.17	12.5