

University of Rajshahi
Department of Computer Science and Engineering
B.Sc. Engineering Part IV Even Semester Examination 2020
Course Code: CSE 4221
Course Title: Web Engineering

Full Marks: 52.5

Time: 3 Hours

[Answer any SIX (06) questions taking THREE (03) from each section]

Section A

1. a) What is a Web App? Discuss how Web Apps are different from traditional software? 4.00
b) Briefly discuss various categories of web applications. 4.75
2. a) What do you understand by web engineering? 1.25
b) Discuss the generic activities that are the parts of a Web Engineering framework. 4.00
c) What tasks are required to develop an increment plan for Web Apps? 3.50
3. a) Discuss the life cycle of a http request. 3.50
b) How a web server remembers a web client between requests? 2.50
c) Explain different ways of including CSS to a HTML page. 2.75
4. a) Mention some benefits of OOP in the context of web application development. 2.75
b) Write a very simple class in PHP programming language, with one private variable and its setter and getter functions. Also, give an example of using the class. 1.50
c) What does it mean to autoload classes in PHP? Explain the concepts of inheritance, interfaces and traits in the context of OOP in PHP. 4.50

Section B

5. a) Discuss the various reasons you need to test for developing Web App. 3.00
b) Explain the AEIOU principles of application testing. 2.75
c) What types of tests are performed during the lifecycle of a Web App. Discuss. 3.00
6. a) Compare among MySQL, MySQLi and PDO extensions of PHP for interacting with databases. 3.00
b) When is the right time to start designing the database in web application development process? Why do you think so? 3.00
c) What is the MVC design pattern? Why some of the most popular web application development frameworks use MVC? 2.75
7. a) For communicating with various RDBMS, what APIs are available in PHP? Discuss advantages and disadvantages of them. 5.00
b) How `query()` and `exec()` methods differ in PDO? 2.00
c) What is `composer`? Explain the basic structure of a `composer.json` file. 1.75
8. a) Discuss how the following attacks are performed on an insecure Web App and how can we protect against those attacks: 2.25×3
 (i) SQL Injection
 (ii) File upload attack
 (iii) Cross-site request forgery
b) What measure should you take to secure your website? 2.00



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SECTION A
ANSWER ANY THREE OF THE FOLLOWINGS

- 1.(a) What are the different types of web-based systems? Provide examples for each. [4.00]
(b) What agility principles are adopted by a good Web Engineering Team? [4.75]
- 2.(a) Emphasize the importance of communication activity in WebbE process. What technique is used for communication with the stakeholders? [2+3]
(b) Discuss 'use case diagram' as web app analysis tools. [3.75]
- 3.(a) Define composer. [2.75]
(b) Explain important directories used in a common Laravel application. [3.00]
(c) What are named Routes in Larevel? [3.00]
- 4.(a) How does `spl_autoload_register` allow for more flexibility and customization in autoloading classes than `_autoload`? [3.00]
(b) What is trait in PHP, and how is it different from a class or interface? [4.00]
(c) What is the difference between `require()` and `require_once()` function? [1.75]

SECTION B
ANSWER ANY THREE OF THE FOLLOWINGS

- 5.(a) Why testing is necessary for web application? [3.00]
(b) How does Integration test differ from Acceptance test? [3.00]
(c) Briefly explain the idea of 'code coverage'. [2.75]
- 6.(a) What are the three components of the MVC architecture, and what is the role of each component? [4.50]
(b) How does a router interact with a controller in a MVC web application? [3.00]
(c) What is Object-Relational Mapping (ORM)? How it is done in Laravel MVC Framework? [1.25]
- 7.(a) What are the advantages of using prepared statements in PDO? Rewrite the code below so that it uses PDO prepare statement. [2+3]
`$db = new PDO(...);`
`$suthor = 'Adam Smith';`
`$row = $db->query("SELECT * FROM book where author ='".$suthor."";");`
(b) What is the possible use-case for anonymous function? [1.75]
(c) Explain how composer is used for dependency management in PHP? [2.00]
- 8.(a) List out common artisan commands used in Laravel. [3.00]
(b) State the difference between get and post method. [3.00]
(c) Why are migrations important? [2.75]