

## Part 1: Short Answer Questions: Please answer in your script book

Instructions for short-answer questions: Use complete sentences. The length of your answer should be one to three sentences or, where required, one or two lines of Perl code.

1. What is the output of the following script?

```
$counter = 1;
while ($counter <= 5) {
    if ($counter == '4') {
        last;
    }
    print ((2*$counter)x2);
    $counter++;
}
```

(2)

2. Describe what this program does.

```
@files = ('f1.txt', 'f2.txt', 'f3.txt');
for ($i = 0; $i< $#files; $i++){
    open (FILE, '<$files[$i]>') || die "Cannot open $files[$i]\n";
    @lines = <FILE>;
    close FILE;
    open (FILE, '>out');
    print FILE @lines;
    close FILE;
}
```

(2)

3. Consider the regular expression:

```
/<.*>/
```

What problem occurs if this expression is used to delete tags from HTML and how can this problem be solved?

(2)

4. Write the Perl code to retrieve and print the value of a form element of type "checkbox" and name "phone".

(2)

5. Write a regular expression which tests the security of a textfield in an HTML form which expects a username of exactly 6 characters. The username should be formed according to standard Unix conventions.

(2)

6. What is a major difference between Perl and PHP?

(2)

7. In a CGI script, which CGI environment variable contains the URL of the HTML form that invoked the CGI script?

(2)

8. How can a CGI script maintain sessions without storing any information on client computers?

(2)

9. What is an advantage of using the DBI.pm module over other database interface modules?

(2)

10. Give a few examples of applications which should be implemented using server-side technology, not client-side technology. Briefly explain why that is the case.

(2)

Total marks: [20]

## Part 2: Essay Questions: Please answer in your script book

Instructions for essay questions: Include arguments and examples, where appropriate, to support or illustrate your answers. Before you start each problem, take a few minutes to think and outline your ideas. Write a well-organised, coherent answer.

1. A library wants to convert their paper catalogue to an on-line format. Library patrons will be able to search for books and to request books in the new catalogue. Staff members can enter new books and can track which books are currently rented by whom.

(a) Describe the different components required for this server-side web application. Mention any Perl modules or other applications that you would utilise. You can include diagrams in your explanation.

(5)

(b) Describe the elements of each HTML form that you would design for this application in general terms. Do not include HTML code in your description. You can draw a diagram that shows what each form will look like.

(5)

(c) Discuss the advantages and disadvantages of using a database for some tasks of your application. Which tasks are better suited for databases and which are better suited for Perl?

(5)

Total marks: [15]

2. On the web many discussions can be found which compare Perl and PHP. It is claimed that PHP is more secure and more user-friendly than Perl because the code is easier to read, the language is more rigid and many details are hidden from the user. For example, form variables are automatically available in PHP scripts.

(a) Discuss the impact which “user-friendliness” has on security. Is a language more secure or less secure if it hides details from programmers? Consider scripting languages but also more traditional languages, such as C and C++, in your answer.

(5)

(b) Discuss which security risks apply to every server-side web application independently of which programming language is used due to the nature of the http protocol. Specifically consider more complex applications which utilise database access, encryption, cookies, file access and open-source libraries.

(5)

(c) Based on your answers to (a) and (b), analyse the claim that “PHP is more secure than Perl”. Is this claim valid or is it misleading? Should security concerns influence the choice of programming language for server-side applications? Explain your answers.

(5)

Total marks: [15]

**End of Paper**