Xi'an Jiaotong-Liverpool University 西交利物浦大學

PAPER CODE	EXAMINER	DEPARTMENT	TEL
CSE308		Computer Science and Software Engineering	

2nd SEMESTER 2018/19 EXAMINATIONS

BACHELOR DEGREE – Year 4

TECHNOLOGIES FOR E-COMMERCE

TIME ALLOWED: TWO HOURS

READ THE FOLLOWING CAREFULLY:

1. Total marks available are 100. Marks for this examination account for 70% of the total credit.
2. The numbers on the right indicate the marks available.
3. Answer ALL questions in all sections.
4. Answers should be written in the answer booklet(s) provided and clearly mark question numbers and write "**Answer:**".
5. The university approved calculator – CASIO FS82ES/83ES can be used.
6. Only answers in English are accepted.

THIS PAPER MUST NOT BE REMOVED FROM THE EXAMINATION ROOM

SECTION A Basic Concepts (20 marks)

A1. Provide definitions for the following terms. (2 marks each)

1. E-business
2. E-commerce
3. Internet commerce
4. Internet
5. Web
6. Business model
7. English auction
8. Dutch auction
9. Privacy
10. Information privacy

SECTION B Analytical thinking (20 marks)

B2. Describe the implications of the eight unique features of e-commerce technology for the overall business environment respectively. (10 marks)

B3. It is said that "the native HTTP protocol does not suit e-commerce applications". Explain the reason for that statement. What technologies can be used to make HTTP suitable for ecommerce applications? (10 marks)

SECTION C Applications (60 marks)

C4. The following code shows a short HTML file, Draw a simple sketch to show what will be displayed in browser. If a user clicked "submit" button what will happen? (5 marks)

```
<html>
<body>

<form action="welcome_get.php" method="get">
Name: <input type="text" name="name"><br>
E-mail: <input type="text" name="email"><br>
<input type="submit">
</form>

</body>
</html>
```

C5. Read the PHP code in **Appendix I**, Answer the following four questions: (15 marks)

1. If you save this file and upload it to a server, what name should you give to this file? And which directory should it be saved to? (2 marks)
2. What does the function on line 19 do? (3 marks)
3. If I change "method" on line 28 from "post" to "get", in line 28 from "post" to "get", to make the program work, what other changes do I have to make? What difference does this change make compared with the original code? (5 marks)
4. The two technologies supporting E-commerce solutions are the "Interactive web page" and "dynamic web page". In the code provided, which part provides interactivity and which part provides dynamic contents? (5 marks)

C6. Explain the two forms of encryption that are often employed in Internet based communication in e-commerce applications. (20 marks)

1. Provide a clear definition with appropriate diagrams for each encryption form. (3 marks)
2. Give three applications of encryption and explain which encryption might be used. (3 marks)
3. Describe the strengths and weaknesses of each approach. (4 marks)
4. Assume you have received a Ciphertext C = 48 and you know the system is using the RSA algorithm. The message was sent to you using your public key {e = 7, n = 143}. Can you find out the original plaintext M? What is your private key? (RSA algorithm is provided in **Appendix II** for your convenience) (10 marks)

C7. You are asked to design an e-bookstore. Answer the following questions. (20 marks)

1. Outline your major design steps. (4 marks)
2. Provide your data structure (customer, products, order) in a relational database with minimum properties. (4 marks)
3. Draw a diagram to show your business data flow with physical device. (4 marks)
4. Draw a flow chat to show the search function that a user can use to find a specific book. (4 marks)
5. Discuss security issues in your design and what methods can be used to ensure the security. (4 marks)

END OF THE PAPER

Appendix I: The following code is for question C5.

```
<!DOCTYPE HTML>
<html>
    <head>
    </head>
    <body>

<?php
// define variables and set to empty values
$name = $email = $gender = $comment = $website = "";

if ($_SERVER["REQUEST_METHOD"] == "POST") {
   $name = test_input($_POST["name"]);
   $email = test_input($_POST["email"]);
   $website = test_input($_POST["website"]);
   $comment = test_input($_POST["comment"]);
   $gender = test_input($_POST["gender"]);
}

function test_input($data) {
   $data = trim($data);
   $data = stripslashes($data);
   $data = htmlspecialchars($data);
   return $data;
}
?>

<h2>PHP Form Validation Example</h2>
<form method="post" action="/form/form_action.php">
Name: <input type="text" name="name">
E-mail: <input type="text" name="email">
Website: <input type="text" name="website">
Comment: <textarea name="comment" rows="5" cols="40"></textarea>
Gender:
   <input type="radio" name="gender" value="female">Female
   <input type="radio" name="gender" value="male">Male
   <input type="radio" name="gender" value="other">Other
   <input type="submit" name="submit" value="Submit">
</form>

<?php
echo "<h2>Your Comment:</h2>";
echo $name . "<br>" . $gender . "<br>" .+ $email . "<br>" . $website . "<br>";
echo $comment + "<br> made on: " . date("Y-m-d h:i:sa");
?>
</body>
</html>
```

Appendix II. RSA algorithm

1. *Select p, q* *where p and q are both prime,* $p \neq q$
2. *Calculate* $n = p * q$
3. *Calculate* $\Phi(n) = (p-1)(q-1)$
4. *Select integer e,* $\gcd(\Phi(n), e) = 1; 1 < e < \Phi(n)$
5. *Calculate d,* $d = e^{-1} \bmod \Phi(n)$, i.e. $d * e = 1 \bmod \Phi(n)$
6. *Public Key* $Kpu = \{e, n\}$
7. *Private Key* $Kpr = \{d, n\}$
8. *Encryption* $C = M^e \pmod n$
9. *Decryption* $M = C^d \pmod n$

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