City& Guilds

9210-218
Level 7 Post Graduate Diploma in Engineering
Internet technologies

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You should have the following for this examination
• one answer book
• pen, pencil, ruler

No additional data is attached

General instructions
• This paper consists of **five** questions.
• Answer any **four** questions.
• All questions carry equal marks. The maximum marks for each section within a question are shown.

1 a) The client/server model partitions workloads between servers and clients.
       i)   List three benefits of the client/server model.   (3 marks)
       ii) Give an example each for a commercially available web server and a
            web client.   (2 marks)
       iii) Briefly explain the difference between fat/thick clients and thin clients.   (4 marks)
       iv) Briefly explain two advantages and two disadvantages of using multi-tier
            client/server architectures.   (6 marks)
       v)   Briefly explain the difference between pure P2P systems and Hybrid
            P2P systems.   (2 marks)
       vi) Give an example each for a pure P2P system and a Hybrid P2P system.   (2 marks)
   b) i)   Briefly explain what a proxy server is.   (2 marks)
       ii) List four uses of proxy servers.   (4 marks)

2 a) Encryption is a fundamental concept in network security.
       i)   Briefly explain secret key encryption.   (3 marks)
       ii) List three security uses of secret key encryption.   (3 marks)
       iii) Briefly explain digital signatures.   (3 marks)
       iv) Briefly explain what is meant by hashing.   (2 marks)
       v)   List three properties of a good hash function.   (3 marks)
       vi) Explain how security is achieved through hashing, by considering password
            hashing as an example.   (3 marks)
   b) Phishing is a serious security concern for online banking.
       i)   Briefly explain what Phishing is.   (2 marks)
       ii) Give an example of a Phishing attack, taking online banking into consideration.   (1 mark)
       iii) Critically analyse how Phishing can affect online banking, taking both the
            customer and the bank into consideration.   (5 marks)

3 a) List three apps and three programming languages supported by a typical web
       hosting service provider.   (6 marks)
   b) Compare six levels of RAID (standard or otherwise) in terms of   (6 marks)
       i)   Stripping,
       ii) Parity,
       iii) Minimum number of drives, and
       iv) Consequences of failure of a disk.
   c) Briefly describe three differences between GET and POST HTML requests.   (6 marks)
   d) Consider the following files:

index.html	welcome.php
``` <html> < body> < form action="welcome.php" method="post"> Name: <input type="text" name="name"> E-mail: <input type="text" name="email"> < input type="submit"> < /form> < /body> < /html> ```	``` <html> < body> Welcome <?php echo $_POST["name"]; ?> Your email address is: <?php echo $_POST["email"]; ?> < /body> < /html> ```

       i)   What would be seen on the browser for the user input "Dave" and "None"?   (3 marks)
       ii) Modify the code to check if the email address is valid using
            server-side scripting.   (4 marks)

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4   a)   Cloud computing is an emerging trend in the Internet.
        i)   List four web based services that can be considered examples for
              cloud computing.   (4 marks)
        ii)   Briefly explain three advantages of cloud computing.   (6 marks)
        iii) Briefly explain two disadvantages of cloud computing.   (4 marks)
    b)   John who is connected to a wireless hotspot at a shopping mall, makes a video
         call to his friend who is currently taking the bus to work.
        i)   List two wireless technologies that may have made this
              communication possible.   (2 marks)
        ii)   Briefly explain social impacts of such video telephony.   (3 marks)
    c)   Social media has already taken up an important part in the day-to-day lives
         of many of us. Explain how privacy has been affected due to social media.   (6 marks)

5   a)   List two advantages each of the following:
        i)   CSS   (2 marks)
        ii)   HTML5   (2 marks)
        iii) XSLT   (2 marks)
    b)   A web page lets the user insert two numbers x and y, and shows the addition
         of the two numbers.
         These numbers are available in $_POST[x] and $_POST[y].
         Write a PHP program to compute the addition, $x + y$.   (6 marks)
    c)   Write a PHP code snippet to do the following:
        i)   Compute and display the squares of numbers from 1 to 10.   (2 marks)
        ii)   Display elements in an array of length 8.   (2 marks)
        iii) Compute the square of a number using a function.   (2 marks)
    d)   A database contains details of students and courses at a university. A given student
         might be in several courses, and naturally, a course will usually have many students.
         Study the following code that creates the tables in this database.

```
create table Students (StudentId int unsigned not null auto_increment,
FirstName varchar(25), LastName varchar(25) not null, primary
key(StudentId));

create table Courses (CourseId smallint unsigned not null auto_increment,
Code varchar(10) not null, Name varchar(100) not null, primary
key(CourseId));

create table CourseMemberships (Student int unsigned not null, Course
smallint unsigned not null, primary key(Student, Course),

constraint CourseMembershipStudentFk

foreign key (Student) references Students (StudentId) on delete cascade
on update cascade,

constraint CourseMembershipCourseFk

foreign key (Course) references Courses (CourseId) on delete cascade on
update cascade);
```

         Write a query to
        i)   List details of all students,   (1 mark)
        ii)   Find all students registered for a particular course with a given CourseId, and   (3 marks)
        iii) Find all courses taken by a particular student given the StudentId.   (3 marks)