

THE HONG KONG POLYTECHNIC UNIVERSITY
HONG KONG COMMUNITY COLLEGE

Subject Title : Introduction to Internet Technology Session : Semester Two, 2018/19 Date : 11 May 2019 Subject : Mr Siu-cheung CHAN Examiner(s) : Mr Yiu-chung CHU	Subject Code : CCN1016 Time : 09:30 – 12:30 Time Allowed : 3 Hours
---	---

This question paper has a total of **SIXTEEN** pages (including this covering page).

Instructions to Candidates:

1. There are THREE sections in this paper.
 - Section A (30%) – Multiple-choice Questions. Answer ALL questions in this section on the multiple-choice answer sheet provided. Each question carries 1 mark. Choose the BEST option for each question.
 - Section B (45%) – Short Questions. Answer any FIVE out of the SIX questions in this section in the answer book provided. Each question carries 9 marks. If you answer more than five questions, only the first five attempted questions will be marked. Indicate in your answer book clearly which five questions you are attempting.
 - Section C (25%) – Long Questions. Answer any ONE out of the TWO questions in this section in the answer book provided. Each question carries 25 marks. If you answer more than one question, only the first one attempted question will be marked. Indicate in your answer book clearly which one question you are attempting.
2. Candidates are NOT allowed to retain the multiple-choice answer sheet, the answer book and the examination question paper.
3. Show all your work clearly and neatly. Marks will be deducted for untidy work.
4. Electronic calculators, including programmable calculators, may be used provided that the calculators are battery powered, silent in operation, with neither printout nor graphic / word display facilities and do not use dot-matrix technology in the main display. All programmes stored in the calculator should have been cleared. Other electronic devices with graphic / word-display facilities (such as databank watches) are not permitted.

Authorised Materials:

	YES	NO
CALCULATOR	[✓]	[]
(All programmes stored should be cleared.)		
SPECIFICALLY PERMITTED ITEMS	[]	[✓]

DO NOT TURN OVER THE PAGE UNTIL YOU ARE TOLD TO DO SO



Section B (45%) – Short Questions

Answer any **FIVE** out of the **SIX** questions in this section in the answer book provided. Each question carries 9 marks. If you answer more than five questions, only the first five attempted questions will be marked. Indicate in your answer book clearly which five questions you are attempting.

Question B1

Calvin and Cyrus are having two different broadband Internet connection services for their homes. Calvin's Internet Service Provider (ISP) uses a local phone network and ADSL modem, while Cyrus's ISP uses cable television (CATV) line, cable modem and line splitter.

- Name the cabling media that Calvin and Cyrus are using for their broadband modem separately. (2 marks)
- Describe ADSL technology in brief with its full name. (2 marks)
- In addition to ADSL, name any **THREE** connection methods that are using digital dedicated lines. (3 marks)
- State **TWO** shortcomings of cable modem over ADSL modem connection. (2 marks)

Question B2

Calvin would like to know more about the current TCP/IP network configuration values he is using. Cyrus typed a command in the command prompt using a Windows environment and part of the result is shown below:

Ethernet adapter Local Area Connection:

```

Connection-specific DNS Suffix . : 
Physical Address. . . . . : 00-77-88-AB-18-19
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes
IPv4 Address. . . . . : 10.0.128.121
Subnet Mask . . . . . : 255.255.252.0
Default Gateway . . . . . : 10.0.128.2

DNS Servers . . . . . : 192.168.223.18
                       192.168.223.19

```

- Which command has been typed by Cyrus? (1 mark)
- What is the MAC address of the machine displayed above? (1 mark)



Question B2 (continued)

- (c) The IP address of the machine belongs to which Class? (1 mark)
- (d) Calculate the possible number of subnets (show your steps clearly). (2 marks)
- (e) Compute the number of usable hosts in each subnet (show your steps clearly). (2 marks)
- (f) Describe the function of a default gateway and an alternate gateway separately. (2 marks)

Question B3

Calvin seems not so familiar with the search process and no idea how to evaluate the credibility of the search results; he always spends a lot of time and efforts but not having the expected result. Cyrus tells him that there are five different steps involved in a typical search process.

- (a) List the first **TWO** steps which involved in a typical search process before performing the search. (2 marks)
- (b) In addition to objectivity, design and functionality, suggest **TWO** areas for evaluating the credibility of webpages in the search results, elaborate your suggestions. (4 marks)
- (c) Search engine is used as a popular search tool. Explain the three-step process of a search engine. (3 marks)

Question B4

Calvin is consulting Cyrus that how to set up a local area network (LAN) which can share Internet services and company database for his new office. Cyrus tells him that he should consider peer-to-peer or client / server network, and 2-tier or 3-tier database model.

- (a) Discuss any **THREE** advantages of client / server over a peer-to-peer network. (3 marks)
- (b) Describe the 2-tier and 3-tier database model in details. (5 marks)
- (c) List **ONE** advantage of 3-tier over 2-tier database model. (1 mark)

Question B5

A Web portal is a specially designed website that brings information (current news, weather, sports, etc.) together from diverse sources in a uniform way like emails, forums, and search engines, etc. Each information source usually gets its dedicated area on the page for displaying information.



Question B5 (continued)

- (a) Web portals are sometimes classified as horizontal or vertical. Illustrate them with an example of each. (4 marks)
- (b) The following news is captured from Sports channel of Twitter web site:



Reference: <https://twitter.com/i/streams/category/723602639301148673>

Figure 1

- (i) There are media as shown in Figure 1 (being pointed by arrows), which type of technique is commonly used in order to deliver the above media to the audience? (1 mark)
- (ii) There are many characteristics of news-oriented websites, in addition to immediacy and interactivity (being circled in Figure 1), name and explain **FOUR** other characteristics. (4 marks)

Question B6

A portion of total B2B e-business occurs between e-businesses and their technology providers (companies that develop and sell the technologies that make e-business possible). Technology providers includes ISPs, NSPs, networking hardware and application software developers, web hosting companies, and the like.

- (a) What are the major services that web hosting companies are providing? (1 mark)
- (b) Propose **FOUR** common B2B web hosting options to Calvin with brief description for each of them. (8 marks)

- End of Section B -



Section C (25%) – Long Questions

Answer any **ONE** out of the **TWO** questions in this section in the answer book provided. Each question carries 25 marks. If you answer more than one question, only the first one attempted question will be marked. Indicate in your answer book clearly which one question you are attempting.

Question C1

Suppose you are a group of IT trainees. An XAMPP Apache for Windows has just been installed and your team members are going to test whether the server is working or not. In the web server machine, your team member opens a browser and types `http://127.0.0.1` in the address bar, you see a web page as shown in Figure 2 instead of a default Apache web page.

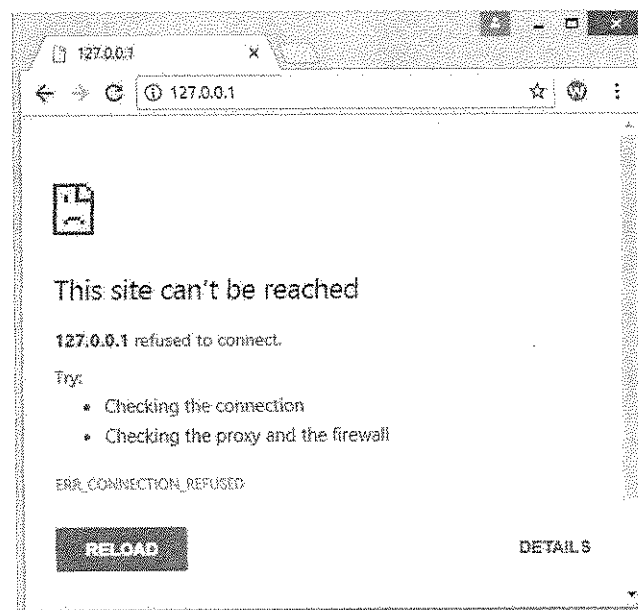


Figure 2

Another team member starts Apache by selecting Start => All Programs => XAMPP => XAMPP Control Panel. Right-click XAMPP Control Panel, then choose Run as administrator (as shown in Figure 3).

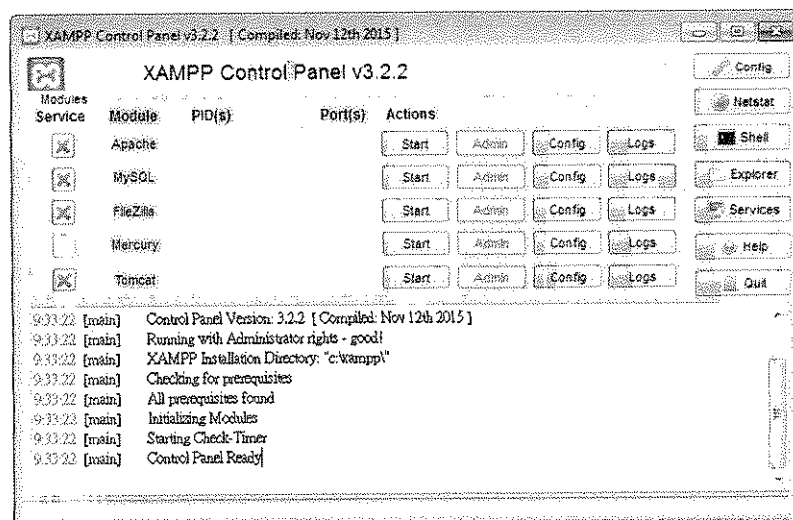


Figure 3

Question C1 (continued)

- (a) (i) Suggest a reason why this is happened. Describe how to solve this problem with the XAMPP Control Panel? (2 marks)
- (ii) For further testing, you would like to bind Apache to the IP address of 127.0.0.19 with the port 3333. Describe how you set it. (2 marks)
- (b) After fixing the situation in part (a) of this question, you are asked to design a web page as shown in Figure 6 and Figure 7 (page 14). You are asked to create an HTML form similar to Figure 4.

Coursework marks:

Coursework weighting: %

Exam weighting: %

Figure 4

Note the following about the form:

- Use the POST method in the form
- When the user clicks the “Estimate” button, the form is sent to a dynamic HTML page called “marks.php”. This PHP file will be put in the root directory of your Web server. You will create this file in part (c) of this question.
- All three input elements are text input with 8 characters.
- Use the following “Name” for the input elements (as shown in Table 1). These names will be referenced again in the PHP file in part (c) of this question:

Input elements	Name
Coursework marks	c marks
Coursework weighting	CW
Exam weighting	EW

Table 1

(5 marks)



Question C1 (continued)

- (c) Create a PHP file called “marks.php”. The page should look similar to the one below (after the user inputs 77 for Coursework marks, 40 for Coursework weighting and 60 for Exam weighting in the HTML form).

Coursework marks:	77
Coursework weighting:	40%
Exam weighting:	60%

Figure 5

Note the following about the PHP file:

- Use \$_REQUEST function to collect the corresponding input elements in part (b) of this question with the following variable names (as shown in Table 2):

Input elements	Variable Name
Coursework marks	\$marks
Coursework weighting	\$CW
Exam weighting	\$EW

Table 2

- The % is just a character output by the PHP program rather than input by the users. (4 marks)

- (d) With the purpose of helping students to set target for achieving the specific exam grade, an additional table is added in the “marks.php” to show the following result pages of different scenarios (as shown in Figure 6 and Figure 7).

Note the following about the PHP file:

- Use the following variable names (as shown in Table 3) for calculating the exam targets:

Exam target	Variable Name
A	\$A
B	\$B
Pass	\$PASS

Table 3

- The PHP program will calculate the exam targets using the formula as follows:

$$\text{Exam target} = \frac{\text{Exam Mark} - \text{Coursework marks} \times \text{Coursework weighting}}{\text{Exam weighting}}$$

- Assume that the user’s input are normal (no error-checking is needed), use if...else structure for checking whether exam target of specific grade is smaller than or equal to 100. “Possible :)” will be shown in the “Remark ***” when it is smaller than or equal to 100; otherwise, “Impossible :(” will be shown instead.



Question C1 (continued)

Scenario 1: the user inputs 70 for Coursework marks, 60 for Coursework weighting and 40 for Exam weighting

Coursework marks:	70		
Coursework weighting:	60%	Exam weighting:	40%
Exam Grade(Mark):	A(85)	B(75)	Pass(60)
Exam target:	107.5	82.5	45
***	Impossible :(Possible :)	Possible :)

Figure 6

Scenario 2: the user inputs 75 for Coursework marks, 50 for Coursework weighting and 50 for Exam weighting

Coursework marks:	75		
Coursework weighting:	50%	Exam weighting:	50%
Exam Grade(Mark):	A(85)	B(75)	Pass(60)
Exam target:	95	75	45
***	Possible :)	Possible :)	Possible :)

Figure 7

Use HTML and PHP to produce the additional table.

(12 marks)



Question C2

(a) Write an HTML file which contains an HTML form using the following format:

Form:

- **title** is set to **Input Form**
- **action** is set to **http://localhost/CCN1016_response.php**
- **method** is set to **POST**

Input elements:

- **name** for First Name textbox: **fname**
- **name** for Last Name textbox: **lname**
- **name** for Gender radio buttons: **gender** – the values of gender are as follows:

Female	F
Male	M
Prefer Not to Answer	O

Table 4

- **name** for Time drop-down list: **time** – the values of time are as follows:

06:00-12:00	9
12:00-18:00	15
18:00-24:00	21
24:00-06:00	3

Table 5

- **name** for Comment with 5 rows and 40 columns: **comment**

The HTML form is used to collect information as shown in the following figure:

Input Form

CCN1016_form.html

First name:

Last name:

Gender: ☐ Female ☐ Male ☒ Prefer Not to Answer

Time:

06:00-12:00
12:00-18:00
18:00-24:00
24:00-06:00

Comment:

Submit Clear

Figure 8

(15 marks)



Question C2 (continued)

- (b) In the “CCN1016_form.html”, when the user clicks the “Submit” button, the form is sent to a dynamic HTML page called “CCN1016_response.php”. This PHP file will be put in the root directory of your Web server. You will create this file by using suitable “name” for the input elements in “CCN1016_form.html” (as shown in [Figure 8](#)).

Write a PHP script called “CCN1016_response.php”. The page should look similar to the [Figure 9](#) below (after the user inputs in the HTML form). It displays the following messages:

1. A greeting messages with the first name (e.g. “Johnny” was entered) and last name (e.g. “Cheung” was entered) collected from the “CCN1016_form.html” form. (in the first line)
2. “Thanks for your comments!” message; and
3. A final greeting message according to the time of a day as collected from the “CCN1016_form.html” form which the message should be:
 - “Have a good morning!” if the time value is less than 10;
 - “Have a good day!” if the time value is between 10 and 20;
 - “Have a good night!” if the time value is greater than 20.

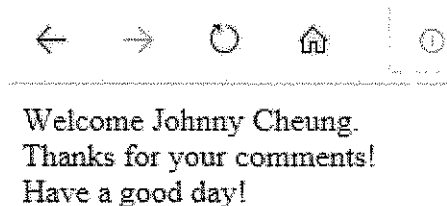


Figure 9

(10 marks)

- End of Section C -

- END OF PAPER -

