UNIVERSITI SAINS MALAYSIA

Stamford College

First Semester Examination
2002/2003 Academic Session
September 2002

External Degree Programme
Bachelor of Computer Science (Hons.)

CPT211/CPP201 – Programming Language Concepts and Paradigms

Duration : 2 hours

INSTRUCTIONS TO CANDIDATE:

- Please ensure that this examination paper contains **FOUR** questions in **FIVE** printed pages before you start the examination.
- Answer **ALL** questions.
- On each page, write *only your* ***Student ID***.

1. (a) Discuss briefly by giving **two (2)** examples of the advantages on using the right programming language to solve certain problem domain.

(6 marks)

(b) A syntax is said to be redundant if it communicates the same item of information in more than one way. Briefly explain the advantages and disadvantages of redundancy.

(6 marks)

(c) Hybrid implementation technique is better than pure interpretation technique in source code translation.

(i) Explain **two (2)** factors why pure interpretation is less efficient?

(ii) Explain briefly how hybrid implementation technique is faster than pure interpretation? State **two (2)** programming languages which use this technique.

(7 marks)

(d) Explain **two (2)** types of the programming language paradigms below:

(i) Event driven programming

(ii) Parallel programming

(6 marks)

2. (a) Given EBNF as shown below:

```
<exp>    <term> {(+ | -) <term>}
<term>    <factor> {(* | / ) <factor>}
<factor>    '(' <expr>')' | <number>
<number>    <digit> {<digit>}
<digit>    0 | 1 | 2 | 3 | …..| 9
```

Rewrite the EBNF above in BNF notation.

(5 marks)

(b) Given BNF as shown below:

```
<X> → (senarai) | 1
<senarai> → <senarai> , <X> | <X>
```

(i) Draw a syntax diagram for above BNF notation.

(ii) Show the string derivation as given: ((1,1),1,(1)) based on the above BNF notation and draw a parse tree.

(7 marks)

(c) Briefly explain with an example the meaning of:

(i) Single inheritance and multiple inheritances

(ii) Overloaded operation

(7 marks)

(d) Explain **two (2)** differences between routine and co-routine.

(6 marks)

3. (a) (i) Explain the meaning of scope of variable in program.

(ii) Explain **two (2)** differences between static scope and dynamic scope of program.

(8 marks)

(b) Given a piece of source code below:

```
main()
{
   x = adios1();
   adious2();
}

adious1(void)
{
   int x,z; x = 2;
   y = x + 2; z = 107;
   return z;
}
```

```
Void adious2(void)
      {
      int y ; x = 5; y = 3;
       cetak();
    }
      void cetak(void)
      {
      cout << x << " " << y << endl;
      }
```

Give the value of **x** and **y** if static scope and dynamic scope are used. Explain how you get the answer.

(9 marks)

(c) (i) Briefly explain with an example the statement-level sequence control below:

- Alternation
- Iteration

(ii) Given a C++ piece of code below:

```
int kira( int *k)
{    int j;
     j = 2
     *k  +  = 5;
     *k + = j;
     return 6;
}

main()
{
int m=3;
m= m + kira(&m);
}
```

Determine the value of **m** and briefly explain how you get the value if:

- The operand is evaluated from left to right.
- The operand is evaluated from right to left.

(8 marks)

4. (a) (i) What is the meaning of type checking?

(ii) Give **two (2)** disadvantages of dynamic type checking.

(6 marks)

(b) (i) Briefly explain **two (2)** differences between explicit declaration and implicit declaration. Give **one (1)** example of declaration for each using the appropriate programming language.

(ii) Given the following syntax:

```
<Form method="type" action = "cgi script to execute"> text </Form>
```

- Briefly explain the function "form" and "cgi-script".
- Give **two (2)** methods of "type"

(6 marks)

(c) (i) Briefly explain the meaning of data type hash in Perl scripting language. Give example of data declaration type hash and show how to retrieve data from hash.

(ii) State the usage of function **split** and **chomp** in Perl.

(5 marks)

(d) (i) Briefly explain **two (2)** differences between user defined variable and system defined variable in Linux scripting language. (Give **one (1)** example for each).

(ii) Write a program in Linux scripting language to accept 10 integers as input from the keyboard. Your program should be able to identify the odd and even integer number. Finally display the total number of odd integers and the total number of even integers on the monitor screen.

(8 marks)

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