TUNKU ABDUL RAHMAN UNIVERSITY OF MANAGEMENT AND TECHNOLOGY

FACULTY OF COMPUTING AND INFORMATION TECHNOLOGY

ACADEMIC YEAR 2023/2024

JANUARY EXAMINATION

AACS1074 PROGRAMMING CONCEPTS AND DESIGN I

WEDNESDAY, 10 JANUARY 2024 TIME: 2.00 PM – 4.00 PM (2 HOURS)

DIPLOMA IN COMPUTER SCIENCE

DIPLOMA IN INFORMATION TECHNOLOGY

DIPLOMA IN INFORMATION SYSTEMS

Instructions to Candidates:

Answer **ALL** questions. All questions carry equal marks.

AACS1074 PROGRAMMING CONCEPTS AND DESIGN I

Question 1

a) Identify the data type for the following literal constants.

(i) 12345

(ii) "12345"

(iii) 123.45f

(iv) 123.45

(v) '5'

(5 marks)

b) Identify whether the following identifiers are valid or invalid according to C language and Camel Case Naming Convention. Provide reason if it is invalid.

No	Identifier	Valid/Invalid	Reason if identifier is invalid
(i)	_error		
(ii)	2save		
(iii)	doublc		
(iv)	GST RATE		
(v)	serviceStatus		
(vi)	include		
(vii)	payment2023		
(viii)	for		
(ix)	interest$		

(14 marks)

c) Write C statement according to the following.

(i) Declare price of a PC which is initialised to 3500.00.

(ii) Declare grade of a student and initialise to value 'A'.

(iii) Declare a variable PI as a memory constant with value 3.142.

(6 marks)

[Total: 25 marks]

Question 2

a) Given the following printf statements, show the output for each of the statements. Use ▯ to indicate one blank space in your output.

(i) printf("%5d\n", 123);

(ii) printf("%8.2f\n", 123.456);

(iii) printf("%-8.2f\n", 123.456);

(iv) printf("%5s\n", "cat");

(v) printf("%8.6s\n", "beautiful");

(5 marks)

b) Given int a = 2, b = 30; what is the output produced by the following code segment? (Hint: (i) to (iv) are inter-related)

(i) printf("a = %d, b = %d\n", a++, b++);

(ii) printf("a = %d, b = %d\n", ++a, ++b);

(iii) printf("a = %d, b = %d\n", --a, b--);

(iv) printf("a = %d, b = %d\n", a--, b--);

(8 marks)

c) Convert the following algorithm that is written in pseudocode into a complete flowchart:

```
BEGIN
  Set female =0, male = 0
  Read number of students
  WHILE number of student not equal to 0
     Read student's gender
     IF gender is equivalent to 'F' THEN
           female increased by 1
     ELSE
           male increased by 1
     END IF
     number of student decreased by 1
  END WHILE
END
```

(12 marks)

[Total: 25 marks]

Question 3

a) Convert the following formula into C programming code.

$$x = \sqrt{2a(b+c)} + 2y^3$$

(5 marks)

b) (i) Write a **Menu()** function by using C programming code, this function will produce the following output and return user input as an end result.

```
**************************
   Membership Menu
**************************
[1] Gold

[2] Silver

[3] Classic

[4] EXIT

*****************************
Enter option [1-4]:
```

(8 marks)

(ii) Write in C programming code to implement a menu validation, in which it will repeat calling the **Menu()** function in Question 3 b) (i) until the user input is a valid option. A message will be displayed based on user input as shown in the table below (Hint: use do-while loop for menu validation and case structure to handle user selection).

User Input	Message displayed
1	You are entitled of 50 percent discount
2	You are entitled of 20 percent discount
3	You are entitled of 10 percent discount
4	Good Bye!!
others	Invalid Option!! Please try again!

(12 marks)

[Total: 25 marks]

Question 4

a) (i) Declare and initialise an array (named **intArray)** to 0, this array can store up to 10 integers. (3 marks)

(ii) Write in C programming code to prompt and get 10 integers from user and store those integers into the array **intArray**. (5 marks)

(iii) Write a C programming statement to add 5 into the fourth integer of **intArray**. (2 marks)

(iv) Write in C programming code to find the highest integer in **intArray**. (5 marks)

b) (i) Declare a 2-D array (named **myArray**, with 4 rows and 3 columns) of type integer and initialise the 2-D array to 0. (3 marks)

(ii) Write C programming statements to prompt and input 12 integers into **myArray**. (5 marks)

c) Write a C programming statement to compare the strings s1 with s2 and print the result. (2 marks)

[Total: 25 marks]