



FINAL EXAMINATION

Semester	:	MAY 2025 SEMESTER
Programme Name	:	DIPLOMA IN COMPUTER SCIENCE
Course Code & Name	:	DCS1253 PROBLEM SOLVING IN COMPUTING
Duration	:	3 HOURS

INSTRUCTIONS TO CANDIDATES:

1. Please read the instructions given in the question paper **CAREFULLY**.
2. The question paper consists of **FOUR (4)** questions.
3. Answer **ALL** questions in the question paper.
4. Answers to the questions are to be written into the examination booklet.
5. Electronic dictionaries, lecture notes, files or any unauthorised materials except writing equipment are strictly prohibited.

This question paper must be submitted along with all used and/or unused rough papers and/ or graph papers (if any). Candidates are **NOT ALLOWED** to take any examination paper(s) used or unused out of the examination hall.

WARNING:

The Examination Board of Peninsula College Georgetown regards cheating as a very serious offence and will not hesitate to mete out the appropriate punitive actions according to the severity of the offence committed, and in accordance with the clauses stipulated in the Students' Handbook, up to and including expulsion from Peninsula College Georgetown.

(This booklet contains 4 printed pages including this page)

DO NOT OPEN THIS BOOKLET UNTIL YOU ARE ALLOWED TO DO SO

Answer **ALL** questions on the separate sheet provided.

[100 marks]

1. a) What is the difference between a syntax error and a logical error in debugging? (4 marks)

- b) Describe the difference between Procedural Programming and Object-oriented Programming. (4 marks)

- c) Imagine you are developing an e-wallet app like Touch-and-Go app. Break down the application into its core components and explain the role of each in ensuring smooth functionality.

Components:

- i) Main problem the application addressed. (2 marks)
- ii) Main inputs into the application. (2 marks)
- iii) Describe how the application process input to provide solution. (2 marks)
- iv) Explain how the output is presented to the user. (2 marks)

- d) Explain **THREE (3)** career opportunities for a Computer Programmer. (9 marks)
Total: [25 marks]

2. a) An algorithm refers to a sequence of clearly defined steps that are followed to solve a particular problem or accomplish a specific task. Explain any **TWO (2)** methods used to represent algorithms. (5 marks)

- b) Imagine you are a software developer for an Monthly Planner App. Explain **THREE (3)** core features you would include in your app. (9 marks)

- c) **Figure 1** shows a chart with various weights value. The goal of the algorithm is to determine the route with maximum value output. Answer the following questions:

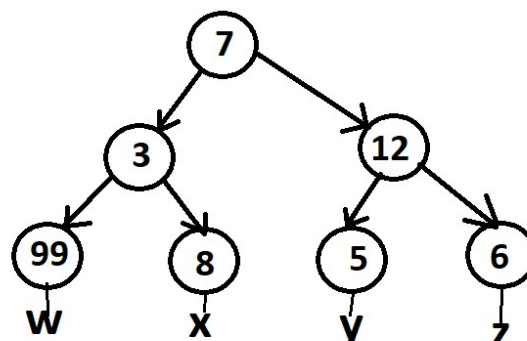
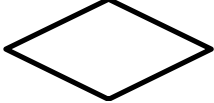


Figure 1

- i) Based on Greedy algorithm which route will be the solution output; w, x, y, or z? (3 marks)
 - ii) Explain how Greedy algorithm works based on the **Figure 1** shown. (4 marks)
 - iii) Give **ONE (1)** advantage and **ONE (1)** disadvantage of Greedy algorithm. (4 marks)
- Total: [25 marks]

3. a) Flowcharts are useful for visually representing algorithms. Describe what each of the following symbols represents in a flowchart.

- | | | |
|-------------------------|---|----------|
| i) Oval |  | (1 mark) |
| ii) Rectangle |  | (1 mark) |
| iii) Parallelogram |  | (1 mark) |
| iv) Diamond |  | (1 mark) |
| v) Rectangle with lines |  | (1 mark) |

- b) **Figure 2** shows a flowchart for an Expenses Tracker App that tracks the user's expenses and the rebate amount from retailers. The flowchart contains **FIVE (5)** symbol error. Redraw the entire flowchart with the correct symbols. (10 marks)

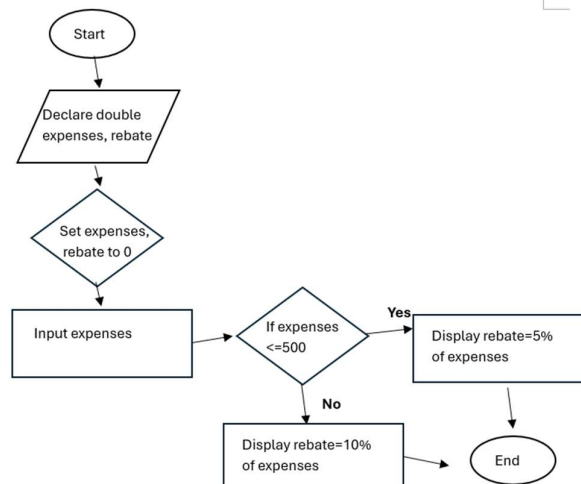


Figure 2

3. c) Based on your answer in **Question 3(b)**, write the pseudocode for this Expenses Tracker App. (10 marks)
Total: [25 marks]

4. a) Assume that the school fees for year 1 and year 4 is **RM1200.00** and **RM2500.00** respectively irrespective of the **code**. The fees for year 2 and year 3 depend on the **code** as shown in the table in **Figure 3** below:
Write a complete pseudocode based on the data in **Figure 3**. (14 marks)

Year	Code	Fee(RM)
1		1200.00
2 or 3	A	1800.00
	B	2000.00
	Others	2200.00
4		2500.00

Figure 3

- b) **Figure 4** shows the pseudocode of a Main program that calculates the perimeter of a square using modular approach. Draw the flowchart of the program. (11 marks)

```
• START Main
  • DECLARE INT perimeter, choice
  • DISPLAY "Choose an option:"
  • DISPLAY "1. Calculate perimeter of the square"
  • INPUT choice
    • IF choice == 1 THEN
      • Perimeter=CALL perimeter()
      • PRINT "The perimeter of the square is:", Perimeter
    • ELSE
      • DISPLAY "Invalid choice"
    • END IF
  • END Main
```

Figure 4

- END OF QUESTIONS -

Total: [25 marks]