



**UNIVERSITI TEKNOLOGI MARA
PRACTICAL TEST**

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|--------------------|----------|------------------------------|
| COURSE | : | PROGRAMMING PARADIGMS |
| COURSE CODE | : | CSC305 |
| DURATION | : | 2 HOURS |
| NAME | : | |
| MATRICS NO | : | |
| GROUP | : | |

INSTRUCTIONS TO CANDIDATES

1. This paper contains **TWO (2)** questions and a scoring rubric.
2. I know that plagiarism is wrong. Plagiarism is to use someone else's work and present it as your own.
3. This assignment/project/test/quiz/final assessment is my own work.
4. I have not been involved, nor will I allow anyone to copy my work with the intention of passing it off as their work.
5. I acknowledge that copying someone else's work (or part of it) is wrong and declare that my submission is my own.

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| |
| 100 MARKS |

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO

This test paper consists of 5 pages

PRACTICAL TEST (20%)**SUBMISSION GUIDELINES**

1. Answer script (.pdf)
 - Create a document and rename it as **YourFullName_Id_Group.pdf**
Example : AliHassan_2025222333_4A.pdf
 - Your answer script must include the following information on the first page
 - Full Name
 - Matric Number
 - Group
 - For each question:
 - Provide a screenshot of your answer
 - Paste the screenshot into the answer script
 - Clearly label each answer according to the question number
2. Question 1 – Scheme
 - Write the function definition using the installer
 - Copy your code to Notepad and save as :
Q1_FullName_ID_GROUP.txt
3. Question 2 – Prolog
 - Write the facts and rules in txt file (Notepad)
 - Save your code as : **Q2_FullName_ID_GROUP.pl**

Files to upload to Microsoft Teams

1. Answer Script - PDF file (YourFullName_Id_Group.pdf)
2. Q1_FullName_ID_GROUP.txt
3. Q2_FullName_ID_GROUP.pl

QUESTION 1 - SCHEME PROGRAMMING LANGUAGE

A university wants to automate part of its student grading system. As a programmer, you are asked to implement a Scheme program that can generate the average score from THREE (3) assessments and display the appropriate grade for the average score.

- a. Create a function called **average** that receives **THREE (3)** assessment scores and calculates the average.
- b. Write a Scheme function called **grade** that takes **THREE (3)** assessment scores as arguments and displays the corresponding letter grade based on the average score. Function **grade** must use the function in (a) to calculate the average score.

Use the following grading scale to determine the grade:

- **90 and above** → A
- **80 to 89** → B
- **70 to 79** → C
- **60 to 69** → D
- **Below 60** → F

- c. Assume the three assessment marks are 70, 80, and 90. Call the function **grade** and show the output that will be displayed.

QUESTION 2 – PROLOG PROGRAMMING LANGUAGE

You are required to develop a program using logic programming (Prolog) for determining the monthly bill for mobile users based on their subscribed data plan and monthly data usage (in GB).

| Plan Type | Base Price (RM) | Free Quota (GB) | Extra Rate (RM) |
|-----------|-----------------|-----------------|-----------------|
| Basic | 30 | 5 | 5 |
| Standard | 50 | 10 | 3 |
| Premium | 70 | 20 | 2 |

Table 1: Plan Pricing Table

| Name | Plan Type | Data Used (GB) |
|-------|-----------|----------------|
| Ali | Basic | 8 |
| Lisa | Standard | 9 |
| Kumar | Premium | 25 |

Table 2: User subscription data.

- Write Prolog facts to represent Table 1 and Table 2 using the following format:

```
%plan(PlanType, BasePrice, FreeQuota, ExtraRate).  
%user(Name, PlanType, DataUsed).
```
- Create a rule to compute the extra charge incurred by a user who exceeds their allocated data quota. If the user remains within the quota, the extra charge should be zero.
- Using the predicate from Question (b), write a rule to calculate the total monthly bill using the following formula:

$$\text{Total Bill} = \text{Base Price} + \text{Extra Charge}$$
- Write a query that lists the names of users whose total monthly bill exceeds RM50, along with the corresponding bill amount.

END OF QUESTIONS PAPER

