CONFIDENTIAL

Fakulti Komputeran

UNIVERSITI TEKNOLOGI MALAYSIA

PROBLEM SOLVING TEST

SEMESTER I 2014/2015

SUBJECT CODE	**: SCJ1013 / SCSJ1013**
SUBJECT NAME	**: PROGRAMMING TECHNIQUE I**
YEAR/COURSE	**: 1 (SCJ / SCV / SCB / SCR)**
TIME	**: 2 HOURS**
DATE	**: 30 SEPTEMBER 2014**
VENUE	**: N28 BK1-BK7**

INSTRUCTIONS TO THE STUDENTS:

This test book consists of 2 sections:

Part A: Output tracing [35 Marks]

Part B: Problem solving [25 Marks]

ANSWER ALL QUESTIONS IN THIS QUESTION PAPER.

Name	
I/C No.	
Year/Course	
Section	
Lecturer Name	

PART A – OUTPUT TRACING QUESTION

QUESTION 1

Trace the flow chart in **Figure 1** and record the output for the given input values in **Table 1**.

[5 marks]

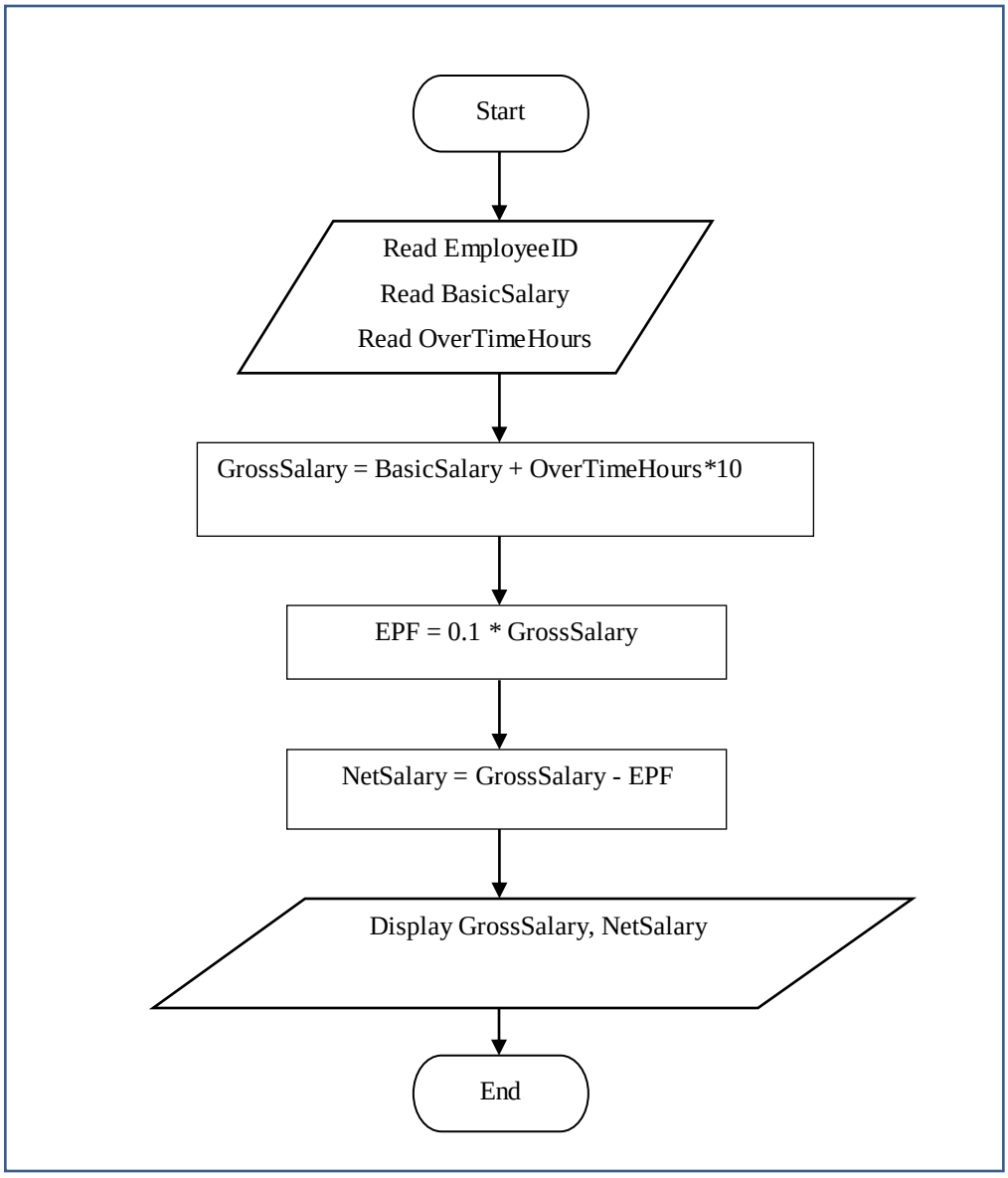

Figure 1

ANSWER:

[5 marks]

Table 1

EmployeeID	BasicSalary	OverTimeHours	Output
011	900	25	
022	1200	15	
033	1400	14	
044	1600	25	
055	1500	20	

Notes to the compiler:

I could not test this question as some parts of the figure are blanks
-jumail-

QUESTION 2

Based on the following pseudo code in **Figure 2**, complete the trace table given in **Table 2** .

[16 marks]

Pseudo Code 1: Display value of No and Sum

```
1. Start
2. Read No
3. Set Sum = 2
4. while (No < 5) do
    4.1 Start_while
        4.1.1 No = No +3
        4.1.2 Sum = Sum + No
    4.2 End_while
5. while (No  < =10) do
   5.1 Start_while
        5.1.1 No = No + 4;
        5.1.2 Sum = Sum + No
    6.2 End_while
7. Print  "No  is "  No
8. Print  " Sum is "  Sum
9. End
```

Figure 2

ANSWER:

[16 marks]

Table 2

Input	No	Sum	Output
0			
1			
5			
10			
12			

QUESTION 3

Flowchart in **Figure 3** calculates the final bill for a specified number of items at a given price at Giant Big hypermarket as depicted. If the sale is a wholesale transaction (coded as W), then no sales tax is charged. However, if the sale is retail transaction (coded as R), then sales tax must be added to the total amount. You are required to provide a trace table as in **Table 3** for each run of the algorithm and determine the output if the input values are as follows:

[14 marks]

Run	Input
1	20, 100, R
2	100, 10, W
3	30, 5, S
4	15, 20, R
5	0

Note: You should use a separate trace table for each run

Notes to the compiler:

Run 1 and Run 4 seem like the same. Either one may be discarded

-jumail-

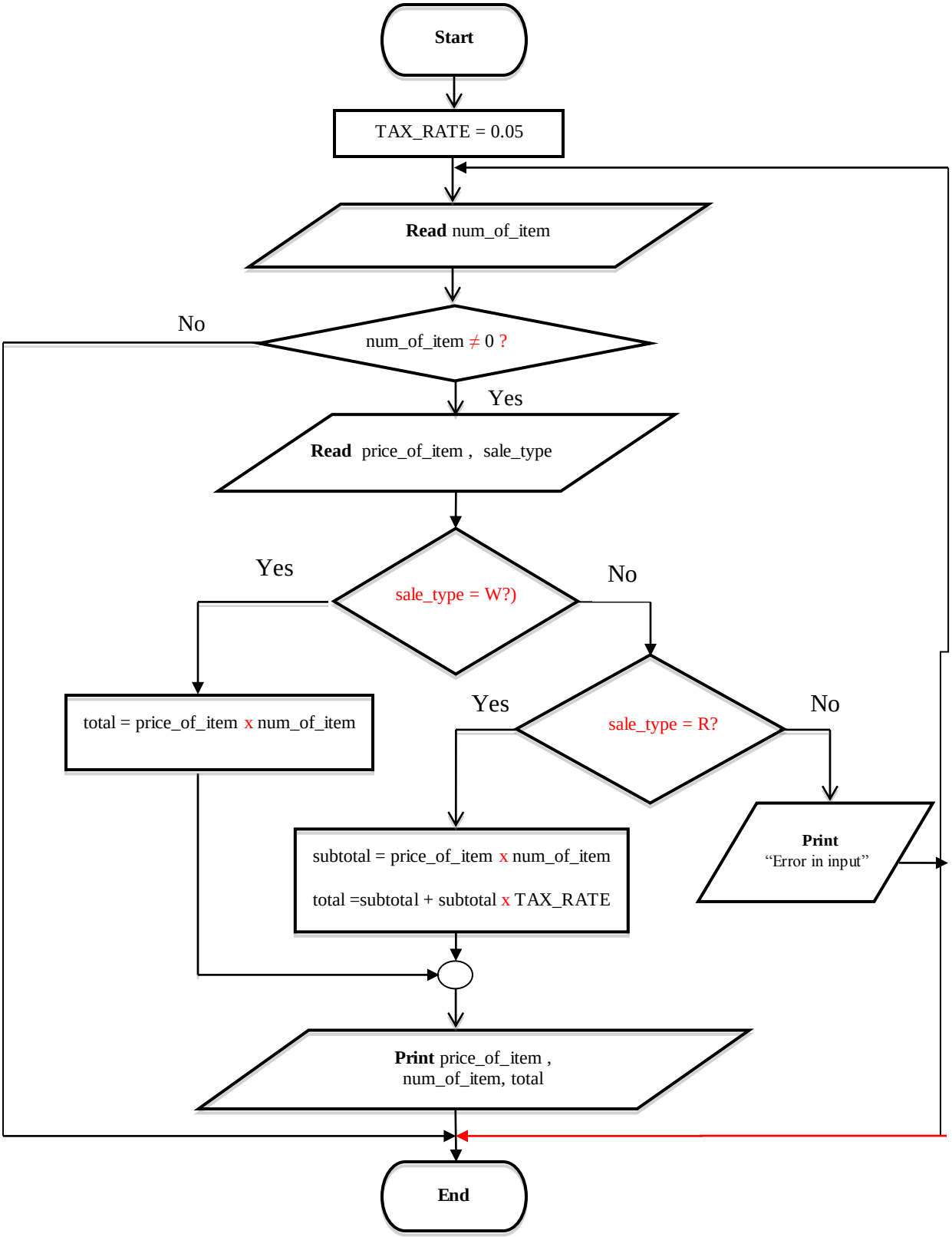
Start
TAX_RATE = 0.05
Read num_of_item
No
num_of_item ≠ 0 ?
Yes
Read price_of_item , sale_type
Yes
sale_type = W?)
No
total = price_of_item x num_of_item
Yes
sale_type = R?
No
subtotal = price_of_item x num_of_item
total =subtotal + subtotal x TAX_RATE
Print
"Error in input"
Print price_of_item ,
num_of_item, total
End

Figure 3

ANSWER:

[14 marks]

Table 3

num_of_item	price_of_item	sale_type	subtotal	total	Output

PART B – PROBLEM SOLVING QUESTION

QUESTION 1

A new highway has been built between Taman Pulai Indah to Johor Bahru. During normal hours, the toll fee rate is RM3 for each kilometer. However at peak hours (i.e, between 8 am to 9 am, and 4 pm to 5 pm, the rate is RM 4 for each kilometer. Design a flowchart to calculate the toll fee.

ANSWER:

Flowchart **[7 marks]**

QUESTION 2

Sunshine is a self-service printing center that provides a photocopy services to UTM students. This center uses 2 sizes of paper; A4 and B5. The photocopy charge for A4 size paper is 6 cent each for the first 10 copies. However, the customer will receive 35% discount of the total charge if the number of copy is exceeded 10 copies but less than 50 copies. If the number of copies is 50 and more, then each copy will be charged 3 cent. Whilst, the photocopy charge for B5 size is 5 cent each for less than 50 copies and 3 cent each for 50 copies and more. The Sunshine owner also needs to prepare certain amount of paper every morning before opening his photocopy center. Therefore, he would like to know the total number of paper A4 and B5 papers used at the end of the day. You are asked by the Sunshine owner to design a simple calculator program that serves his need. Note that, a customer may also use both paper sizes for photocopy. List all possible **input** and **output** required in the program and **draw a flowchart** for this calculator.

ANSWER:

[18 marks]

List of possible input and output

Flowchart