UTHM
Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
(ONLINE)
SEMESTER I
SESSION 2020/2021

COURSE NAME : ALGORITHM AND PROGRAMMING

COURSE CODE : BIC 10204

PROGRAMME CODE : BIM / BIP / BIS / BIW

EXAMINATION DATE : JANUARY / FEBRUARY 2021

DURATION : 3 HOURS

INSTRUCTION : 1. ANSWER **ALL** QUESTIONS.
2. PLEASE MAKE SURE TO CLICK "SAVE ANSWER" BUTTON FOR SUBJECTIVE QUESTIONS.

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THIS QUESTION PAPER CONSISTS OF **FIVE(5)** PAGES

Q1   Find the error in each of the following program segments. Assume :

```
int *zPtr;
int *aPtr = NULL;
void *sPtr = NULL;
int number, i;
int z[5] = { 1, 2, 3, 4, 5 };
sPtr = z;
```

(a)   ``++zPtr;``

(b)   ``/* use pointer to get first value of array; assume zPtr is initialized */``
```
        number = zPtr;
```

(c)   ``/* assign array element 2 (the value 3) to number; assume zPtr is iniatilized */``
```
        number = *zPtr [2];
```

(d)   ``/* print entire array z; assume zPtr is initialized */``
```
        for (i=0; i <=5; i++)
              printf ("%d", zPtr [ i ];
```

                                                       (2 marks)

Q2   Write a program that will implement a one-dimensional array and reverse the array elements. The steps are as follows:

    i.   Start
    ii.   Declare an array, of some fixed capacity, 10.
    iii.   Take the size of the array as input from the user.
    iv.   Define all the elements of the array using for loop.
    v.   Reverse the elements of the array.
    vi.   Print the reversed array as a final output.
    vii.   Exit

Refer to the above description and the example of the runtime test case in **Figure Q2.**

Figure Q2

(16 marks)

Q3 Write a complete program that consists of **FOUR (4)** user defined functions as listed below, to solve the problem as designed in the flow chart in **Figure Q3.**
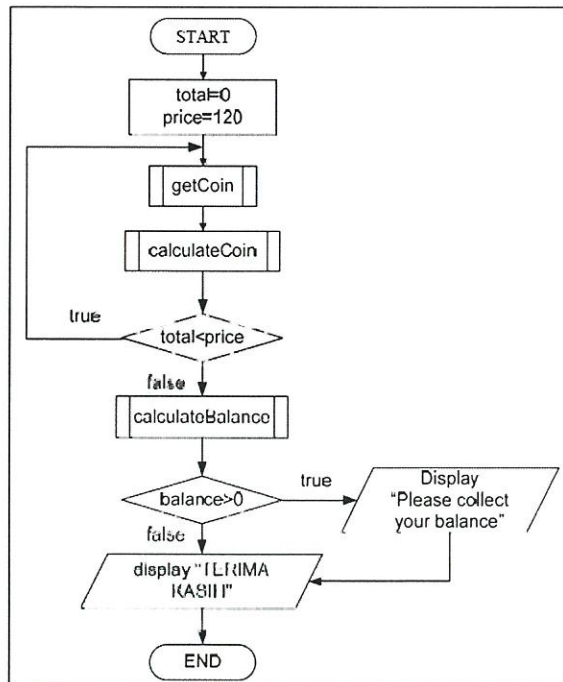

Figure Q3

3

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(a) `int getCoin()`
To read the value of a coin input from the user.

(2.5 marks)

(b) `void calculateCoin(int coin)`
To calculate the total coins entered by the user and display the total amount. Assume 1 coin – 5.

(2 marks)

(c) `int calculateBalance(int totalCoin)`
To compute the balance of the coin and display the balance amount.

(4.5 marks)

(d) `main()`
To solve the problem by calling the appropriate functions based on the flow chart in **Figure Q3**.

(11 marks)

Q4   The answer for question Q4(a) – Q4(e) are interrelated.

(a)   Write a structure type called `car` that contains the car's ID, model and price.

(4 marks)

(b)   Write a program segment for one variable declaration with array to store records of five cars.

(2 marks)

(c)   Write a program segment to read the records of five cars.

(6 marks)

(d)   Write a program segment to calculate car price's average.

(3 marks)

(e)   Write a program segment to print or display car record (ID, model and price) only for odd car's ID.

(5 marks)

Q5   (a)   Rewrite the following 'if-else' statements into 'switch-case' statements.

```
if (value == 0 || value == 1)
    { printf("One or Zero"; }
else if (value == 2)
    { printf("Two"; }
else if (value    3)
    { number - "Three"; }
else
    { return 0; }
```

(10 marks)

(b)   Rewrite the following 'for' loop statements into 'while' loop statement.

```
for (int no = 1; no <= 20; no++)
{
    sum = sum + no;
}
printf("Sum: " + sum);
```

(8 marks)

(c)   Justify and explain an **infinite loop** by giving a sample code to illustrate your answer.

(6 marks)

(d)   Show the output of the following 'while' loop statements using trace table or desk checking strategy.

```
int turns = 0;
int y - 2;
while (turns < 17)
{
    y - y ^ 2;
    turns = turns + 4;
}
printf("%d",y);
printf("\t%d",turns);
```

(8 marks)

-END OF QUESTION -