TIC1002 MIDTERM ANSWER SHEET

ANSWER
Do Not Print!

AY2018/19 Semester 2

NAME:

STUDENT NO.: A 0

/ 40

Write your particulars above legibly using a **PEN**. You may use pencil for your answers below.

1a [9]

`t( 10101, 2 )`	21
`t( 321, 4 )`	57
`t( 56789, 10 )`	56789

b [3]

Complexity is $O(D^2)$ // where D is the number of digits in input

2a [3]

```
int filledCellInRow(int sudoku [][9], int row)
{   // You can write in two column format if the code is too long
     int i, result = 0;
     for (i = 0; i < 9; i++){
          result += (sudoku[row][i] != 0);
     }
     return result;

}
```

Same as:

```
if (sudoku[row][i] != 0)
     result++;
```

b [5]

```
int filledCellInSquare(int sudoku [][9], int row, int col)
{   // You can write in two column format if the code is too long
    int sRow, sCol, i, j, result = 0;

    sRow = row / 3 * 3;  // round down
    sCol = col / 3 * 3;

    for (i = 0; i < 3; i++){
         for (j = 0; j < 3; j++){
              result += (sudoku[i+sRow][j+sCol] != 0);
         }
    }
    return result;

}
```

Same as:

```
if (sudoku[i+sRow][j+sCol] != 0)
     result++;
```

3a [3]

```
struct cell {
        int digit;
        bool used[10];    //[0] not used for simplicity
};
```

b [2]

```
cell    Sudoku [9][9]   ;
```

c [4]

```
void update_column( …Sudoku… , int col, int D )
{     // You can write in two column format if the code is too long
    int i;

    for (i = 0; i < 9; i++){
            Sudoku[i][col].used[D] = false;
    }



}
```

4a [2]

Selection **CAN** / CANNOT be used, because **Student Number is unique. So, there is NO item with similar sorting key actually.**

b [2]

Bubble Sort / **Insertion Sort** should be used, because **insertion sort requires lesser item swapping, which is hard to do with physical paper records.**

c [3]

```
int score[   500    ]; //give the size directly in the []
int freq[      21         ];
int cfreq[       21       ];
```

d [4]

```
void getFrequency( int score[],  int freq[], int nScore)
{  // You can write in two column format if the code is too long
   if (nScore == 0)
       return;

   freq[ score[ nScore – 1] ]++;
   getFrequency( score, freq, nScore-1 );



}
```