

Family Name: \_\_\_\_\_

Given Names: \_\_\_\_\_

Student Number: \_\_\_\_\_

Signature: \_\_\_\_\_

**B**

The University of New South Wales  
**SAMPLE** Final Examination (**Solution**)  
Semester 1, 2017

**ENGG1811 Computing for Engineers**

Time allowed: **2 hours**

Reading time: **10 minutes**

Total number of questions: **29, in 3 Sections**

Total number of marks: **100**

**No** examination materials permitted

Calculators may **not** be used

Questions are **not** worth equal marks

Answer **all** questions

Tables of Matlab and OpenOffice Basic functions and operators are  
included

This paper may **not** be retained by the candidate

**Answers must be written in ink. Except where they are expressly required, pencils may be used only for drawing, sketching or graphical work.**

## Section A: Multiple Choice Questions

Answer the questions in this section on the answer sheet provided, NOT on this paper.

Each question has four alternatives. Once you have chosen an alternative, fill in the selected letter (e.g., "B") against the question number on the multiple-choice sheet. Be careful that you fill each answer in on the correct row of the multiple-choice sheet, and erase any stray marks.

This section is worth 30 marks and contains 24 questions. Each question is worth 1.25 marks. There is no additional penalty for answering a question incorrectly. It is recommended that you spend no more than 30 minutes on this section.

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- A1. Suppose that in an OpenOffice Calc spreadsheet cells A1, B1 and C1 contain the values 2, 3, and 4 respectively. What value will be displayed in a cell containing the formula

`=(A1+C$1)/$A$1+B1`

- A) 2
  - B) 4
  - C) 6 (Ans)
  - D) the formula is invalid
- A2. Which of the following is not a valid formula when typed into the cell L5 in an OpenOffice Calc worksheet?
- A) `=AVERAGE(D6:D11)`
  - B) `=AVERAGE(A$1:B4; D2:$E$5)`
  - C) `=AVERAGE(A2:10D)` (Ans)
  - D) `=AVERAGE(A2)`
- A3. Suppose that in an OpenOffice Calc spreadsheet, cell B2 contains the value 115, and cell C2 contains the value 34. What value will be displayed in a cell containing the following formula?

`=IF(AND(B2<0;C2>100);"Error"; IF(B2<50;"Fail";"Pass"))`

- A) Error
- B) Fail
- C) Pass (Ans)
- D) none of the above

ENGG1811 Sample Final Exam

A4. Consider the following portion of an OpenOffice Calc worksheet.

	A	B	C	D	E	F
1	10	5	2	4		
2	8	2	1	9		
3	6	8	7	5		
4	2	4	6	2	9	
5						
6						
7						

Suppose that cell E4 contains the formula  $=\$B2+C\$3$  and that this cell is now copied to cell D5. What value will be shown in cell D5?

- A) 9
- B) 10
- C) 14
- D) 16 (Ans)

A5. Consider the following portion of an OpenOffice Calc worksheet.

	A	B	C	D
1		42	Hot	
2		18		
3		22		
4		39		
5		10		

Suppose that cell C1 contains the formula  $=IF(\$B\$1>35;"Hot";"Cool")$  and that this cell is now copied to cell C2. What value will be shown in cell C2?

- A) Hot (Ans)
- B) Cool
- C) Error
- D) None of the above

A6. In OpenOffice Calc, the Correlation tool can be used to:

- A) calculate the strength of linear relationship between two or more variables (Ans)
- B) calculate a frequency distribution
- C) display Trendlines
- D) calculate an optimal solution

ENGG1811 Sample Final Exam

A7. Suppose that you want to use the Solver tool in OpenOffice Calc to solve an optimisation problem. For the optimisation problem, you are given a number of locations and the decision variables are the number of sensors to be placed at each location. The objective is to minimise the sensor placement cost. Which of the following is the most appropriate option to use?

- A) Assume variables as integer
- B) Assume variables as non-negative
- C) Both of A) and B) (Ans)
- D) None of A) and B)

A8. Which one of the following statements about names in Calc is true?

- A) Names can only be applied to a single cell
- B) Names can only be used on the sheet where they are defined
- C) Names used in formulas must be quoted
- D) Names such as A1 are invalid because they look like cell addresses (Ans)

A9. What are the values of  $x$  and  $y$  after this **while** loop terminates?  $x$  and  $y$  are variables of type **Integer**.

```
x = 0: y = 0
While x < 5
    x = x + 1
    y = x + y
Wend
```

- A)  $x = 4, y = 10$
- B)  $x = 5, y = 10$
- C)  $x = 5, y = 15$  (Ans)
- D)  $x = 6, y = 21$

A10. If  $blnA$  and  $blnB$  are Boolean variables, which expression is equivalent to

Not ( $blnA$  Or Not  $blnB$ )

- A) Not  $blnA$  Or Not  $blnB$
- B) Not  $blnA$  Or  $blnB$
- C) Not  $blnA$  And Not  $blnB$
- D) Not  $blnA$  And  $blnB$  (Ans)

ENGG1811 Sample Final Exam

A11. The following table lists the arithmetic operators used in OpenOffice Basic in decreasing order of precedence.

( )
+ - (unary: sign)
^
* /
\
Mod
+ - (binary: add, subtract)

What is the value of this constant expression?

$$4 * 3 - -4^2$$

- A) 76
- B) 28
- C) -4 (Ans)
- D) -52

A12. Which of the following statements about the **Step** keyword in OpenOffice Basic is *false*?

- A) **Step** is only used with **For** statements.
- B) **Step** indicates how much a loop control variable changes at the end of each iteration.
- C) **Step** must have a positive step amount. (Ans)
- D) If **Step** and the amount are omitted, the step amount is assumed to be one.

A13. If  $x$  is 25, what is the value of  $y$  after the following block of code has been executed?

```
If x > 40 Then
  y = 1
Elseif x < 30 Then
  y = 2
Elseif x > 20 Then
  y = 3
Elseif x < 10 Then
  y = 4
End If
```

- A)  $y = 1$
- B)  $y = 2$  (Ans)
- C)  $y = 3$
- D)  $y = 4$

ENGG1811 Sample Final Exam

A14. In the program below, what are the values of x and y displayed by the MsgBox command?

```
Sub A13
    Dim x As Integer
    Dim y As Integer
    Dim z As Integer

    x = 1
    y = 2
    z = ZFunc(x,y)

    MsgBox "x = " & x & "y = " & y
End Sub

Function ZFunc(ByVal xCopy As Integer,ByRef yCopy As Integer) As Integer

    xCopy = 3*xCopy
    yCopy = 4*yCopy
    ZFunc = xCopy + yCopy
End Function
```

- A) x = 1, y = 2
- B) x = 3, y = 2
- C) x = 1, y = 8 (Ans)
- D) x = 3, y = 8

A15. In the program below, what is the value of z at the end of the program?

```
Sub A15
    Dim x as Double
    Dim y as Integer
    Dim z as Variant

    x = 1.7
    y = 3.2

    z = x + y

    MsgBox "z = " & z
End Sub
```

- A) z = 4
- B) z = 4.7 (Ans)
- C) z = 5
- D) z = 5.9

ENGG1811 Sample Final Exam

A16. Which of the following would not cause an error when used as an OpenOffice Basic identifier:

- A) 2Difficult
- B) Cat-Tail
- C) IAm18YearsYoung (Ans)
- D) End

A17. Which of the following is equivalent to the Matlab expression `linspace(0,5,11)`?

- A) `0: 5/11: 5`
- B) `0: 0.5 : 5` (Ans)
- C) `0: 5 : 0.5`
- D) `0: 0.5 : 11`

A18. Which Matlab statements do not produce the same result as the following:

`y = [1 , 2 , 3 ; 4 , 5 , 6];`

- A) `y = [[1,4]', [2,5]', [3 6]'];`
- B) `y = [[1,4]'; [2,5]'; [3 6]'];` (Ans)
- C) `x1 = 1:3; x2 = 4:6; y = [x1 ; x2];`
- D) `z = 1:6; y = [z(1:3) ; z(4:end)];`

A19. Given a Matlab matrix M with 10 rows and 20 columns. You would like to extract a submatrix containing the 2<sup>nd</sup>, 4<sup>th</sup>, 6<sup>th</sup>, 8<sup>th</sup> and 10<sup>th</sup> rows of the M. Which of the following is *not* true:

- A) You can use `M(2:2:end,:)`
- B) You can use `M(2:2:length(M),:)` (Ans)
- C) You can use `M(2:2:size(M,1),:)`
- D) You can use any of the expressions in the above three choices

A20. Given two Matlab vectors `v1` and `v2` that have the same dimension, the Matlab built-in function `dot(v1, v2)` forms the dot product of two vectors `v1` and `v2`, that is, the sum of the product of the corresponding elements

$$v1(1) * v2(1) + v1(2) * v2(2) + \dots + v1(N) * v2(N)$$

where N is the number of elements in each vector. Which of the following produces the same result as `s = dot(v1,v2)`?

- A) `s = sum(v1 * v2);`
- B) `s = sum(v1 .* v2);` (Ans)
- C) `s = v1 \ v2;`
- D) `s = prod(v1 + v2);`

A21. Given a vector  $v$ . You want to obtain a sub-vector of  $v$ , which contains all the numbers in  $v$  that are less than  $U$  and greater than  $L$ . Which of the statements below can you use?

- A) `find((v < U) & (v > L));`
- B) `v((v < U) && (v > L));`
- C) `v(find((v < U) & (v > L)));` (Ans)
- D) `(v < U) && (v > L);`

A22. Given a matrix  $M$ , you want to find the number of rows in  $M$  that have all zeros in the row. Which of the following Matlab statement allows you to do that?

- A) `sum(all(M,2));`
- B) `sum(any(M,2));`
- C) `size(M,1)-sum(all(M,2));`
- D) `size(M,1)-sum(any(M,2));` (Ans)

A23. Given a vector  $v$ , which of the following Matlab statement can you use to find the smallest of all those numbers in  $v$  that are bigger than 5?

- A) `min(v > 5);`
- B) `max(v(v > 5));`
- C) `min(v(v > 5));` (Ans)
- D) `min(find(v > 5));`

A24. The Matlab vector  $v1$  has a dimension of  $n$ -by-1 and the vector  $v2$  has a dimension of 1-by- $n$ , which of the following is true?

- A) The operation `v1 * v2` does not return an error (Ans)
- B) The operation `v2 * v1` does not return an error
- C) The operation `v1 .* v2` does not return an error
- D) None of the above