# The University of Nottingham

SCHOOL OF COMPUTER SCIENCE

A LEVEL X MODULE, AUTUMN/SPRING SEMESTER 20XX-20XX

**«MODULE NAME»**

Time allowed: X Hours and Y Minutes

---

*Candidates may complete the front cover of their answer book and sign their desk card but must NOT write anything else until the start of the examination period is announced*

***«Answer Rubric»***

*«Calculator Rubric»*

*Dictionaries are not allowed with one exception. Those whose first language is not English may use a standard translation dictionary to translate between that language and English provided that neither language is the subject of this examination. Subject specific translation dictionaries are not permitted.*

*No electronic devices capable of storing and retrieving text, including electronic dictionaries, may be used.*

***DO NOT turn examination paper over until instructed to do so***

**ADDITIONAL MATERIAL:** «List Additional/Supplementary Materials MUST be specified in this section of the paper Handouts, MCQ, number of answer books x , graph paper, statistical tables (Neaves, SI, E&E), statutes, Books allowed, None».
**INFORMATION FOR INVIGILATORS:** «to include any announcements or to indicate if the paper can be taken away at the end of the examination / None».

SECTION A

**EXAMPLE 1**

**1. Topic 1: «Type_Topic».0**

a. <Type_Text>

[< < > > Marks]

b. <Type_Text>

[< < > > Marks]

c. <Type_Text>

[< < > > Marks]

**End of Question 1: Total < < > > marks**

**EXAMPLE 2**

**Question 1:** <Type_Topic>**.** <Type_Text>

[**overall «» marks**]

a. <Type_Text>

[< < > > Marks]

b. <Type_Text>

[< < > > Marks]

c. <Type_Text>

[< < > > Marks]

**Question 2:** <Type_Topic>**.** <Type_Text>

[**overall < < > > marks**]

**Either** (a) <Type_Text>

[< < > > Marks]

**Or** (b) <Type_Text>

[< < > > Marks]

**Question 3:** <Type_Topic>**.** <Type_Text>

[**overall < < > > marks**]

**Question 4:** <Type_Topic>**.** <Type_Text>

[**overall < < > > marks**]

SECTION B

**Question 5:** <Type_Topic>**.** Answer **two** parts of this question, each carry < < > > marks.

[**overall < < > > marks**]

(a) <Type_Text>
(b) <Type_Text>
(c) <Type_Text>
(d) <Type_Text>
(e) <Type_Text>
(f) <Type_Text>
(g) <Type_Text>
(h) <Type_Text>

**Question 6:** <Type_Topic>**.** <Type_Text>

1. <Type_Text>

[< < > > Marks]

2. <Type_Text>

[< < > > Marks]

3. <Type_Text>

[< < > > Marks]

[**overall < < > > marks**]

**Question 7:** <Type_Topic>**.** <Type_Text>

[**overall < < > > marks**]

**Question 8:** <Type_Topic>**.** <Type_Text>

[**overall < < > > marks**]

**Question 9:** <Type_Topic>**.** <Type_Text>

[**overall < < > > marks**]

**Question 10:** <Type_Topic>**.** <Type_Text>

[**overall < < > > marks**]

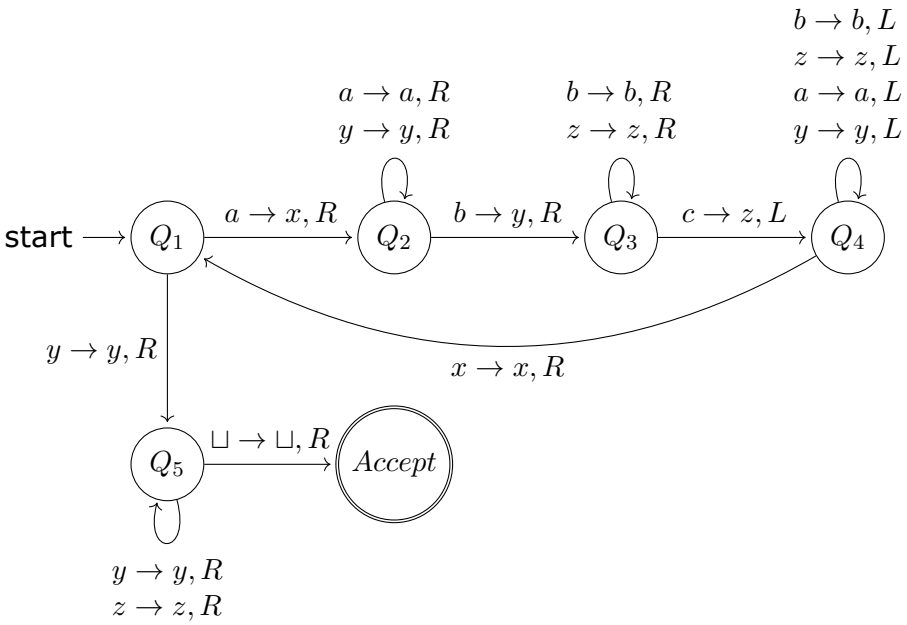
The following pages contain more examples about the formatting and provide a domain specific template for computer science.

SECTION A

**Question 1:**

[**overall XX marks**]

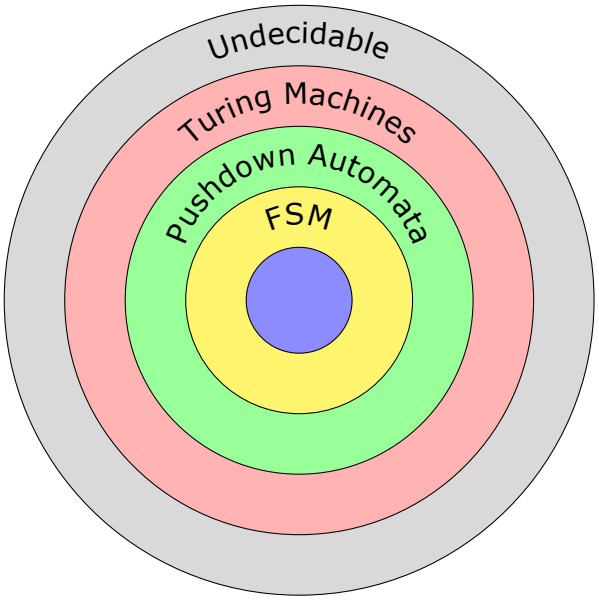
Answer to the following question with graphics



**Question 2:**

[**overall XX marks**]

Answer the following question involving the following graphics and divided into sub-questions.




1. this is one question with inline equations $\sum_{j=1}^{n} x_j \log(x_j)$

[X Marks]

2. this is one question with equations

$$\mathbf{y} \iff \mathbf{Ax} \equiv \begin{cases} y_1 = a_{11}x_1 + a_{12}x_2 + \ldots + a_{1n}x_n \\ a_{21}x_1 + a_{22}x_2 + \ldots + a_{2n}x_n \\ \ldots \\ a_{n1}x_1 + a_{n2}x_2 + \ldots + a_{nn}x_n \end{cases}$$

[X Marks]

3. this is a question about a Table

$\delta$:

| | 0 | 1 |
|---|---|---|
| $A$ | $A$ | $A, B$ |
| $B$ | $C$ | $C$ |
| $C$ | $\emptyset$ | $\emptyset$. |

[X Marks]

SECTION B

**Question 3:**

[**overall 20 marks**]

This is a question about pseudocodes

**Algorithm 1** General Differential Evolution Framework

```
1: Generate an initial population of Np individuals
2: Evaluate fitness of each solution in population Np
3: while termination condition is not met do
4:    for each x^i in Np do
5:       Generate provisional offspring x^off' by mutation
6:       Generate offspring x^off by crossover
7:       Evaluate fitness of x^off
8:       Make a note whether x^i or x^off has a better performance
9:    end for
10:   for each x^i in Np do
11:      Perform all the replacements by choosing the best between parent offspring
12:   end for
13: end while
```

**IMPORTANT NOTE:**

**COMPILE WITH**

***XeLaTex***

**AND NOT**

***LaTex* OR *pdfLaTex***