JetLearn's GCSE (9–1) Computer Science - 2 Mock Exam
J277/01 Computational thinking, algorithms and programming - Boolean Logic and SQL
Time allowed: 1 hour

INSTRUCTIONS

- Use black ink. You can use an HB pencil, but only for graphs and diagrams.
- Write your answer to each question in the space provided. If you need extra space use the lined pages at the end of this booklet. The question numbers must be clearly shown.
- Answer all the questions.

INFORMATION

- The total marks for this paper is 40.
- The marks for each question are shown in brackets [ ].
- Quality of extended response will be assessed in questions marked with an asterisk (*).
- This document has 7 pages.

ADVICE

- Read each question carefully before you start your answer.

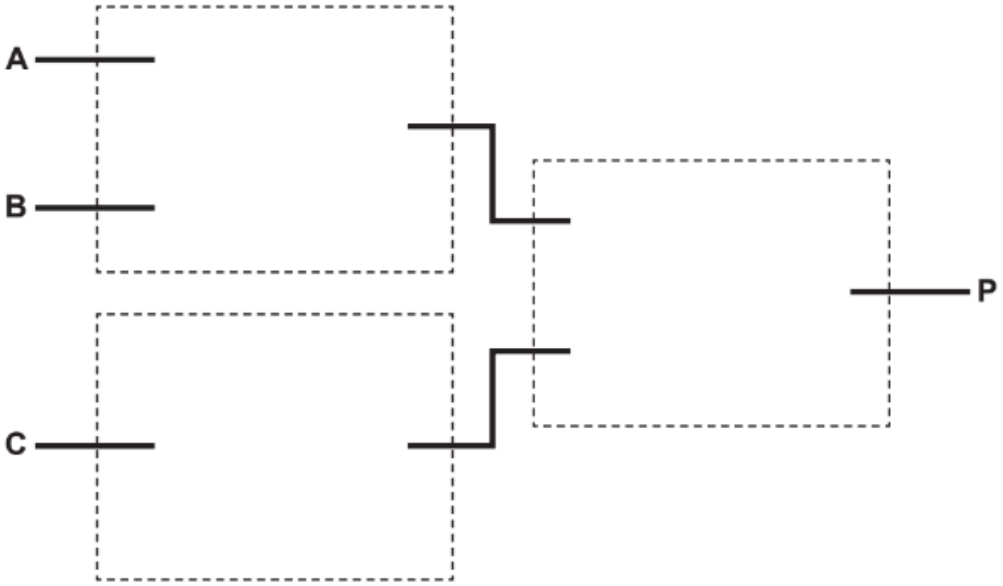
1. A fast food restaurant offers half-price meals if the customer is a student or has a discount card. The offer is not valid on Saturdays.

   A computer system is used to identify whether the customer can have a half-price meal.

   The table identifies the three inputs to the computer system:

Input	Value
A	Is a student
B	Has a discount card
C	The current day is Saturday

   (a) The logic system **P = (A OR B) AND NOT C** is used.
   Complete the following logic diagram for **P = (A OR B) AND NOT C** by drawing one logic gate in each box.



   [3]

   (b)A truth table can be produced for this logic circuit.
   Describe the purpose of a truth table.

   .....

   .....

   .....

   .....[2]

(c) State how many rows (excluding any headings) would be required in a truth table for the logic expression:

P = (A OR B) AND NOT C

.....[1]

2. Customers at a hotel can stay between 1 and 5 (inclusive) nights and can choose between a basic room or a premium room.
(a) A typical booking record is shown in the table:

`firstName`	Amaya
`surname`	Taylor-Ling
`nights`	3
`room`	Premium
`stayComplete`	False

Booking records are stored in a database table called `TblBookings`.
The following SQL statement is written to display all customer bookings that stay more than one night.

```
SELECT ALL
FROM TblBookings
IF Nights < 1
```

The SQL statement is incorrect.

Rewrite the SQL statement so that it is correct.

.....

.....

.....

.....

.....

.....[4]

3. A vending machine stores the quantity of items available in a database table called `ITEMS`.

The current contents of `ITEMS` is shown:

ItemCode	ItemName	Stock
A1	Crisps, bacon flavour	6
A2	Crisps, salted	2
B1	Chocolate bar	12
C1	Apple pieces	18
C2	Raisins	7

Complete the following SQL statement to display the item code for all items that have fewer than 10 in stock.

SELECT .....

FROM .....

.....[4]

4. (a) Draw the logic diagram for the logic system **P = A OR (B AND C)**

[3]

(b) Complete the truth table for the logic system **P = NOT (A OR B)**

A	B	P
0	0	1
0	1	
1	0	

[4]

5. OCR High School uses a computer system to store data about students' conduct. The system records good conduct as a positive number and poor conduct as a negative number. A TRUE or FALSE value is also used to record whether or not a letter has been sent home about each incident.

   An example of the data held in this system is shown below in Fig. 1:

StudentName	Detail	Points	LetterSent
Kirstie	Homework forgotten	−2	FALSE
Byron	Good effort in class	1	TRUE
Grahame	100% in a test	2	FALSE
Marian	Bullying	−3	TRUE

Fig. 1

(a) The data shown above in Fig. 1 is stored in a database table called **`Conduct`**. Write an SQL statement to select the `StudentName` field for all records that have negative `Points`.

.....

.....

.....[3]

(b) State the wildcard that can be used in SQL to show all fields from a table.

.....[1]

6. The logic diagram below (Fig. 2) shows a system made up of two connected logic gates.

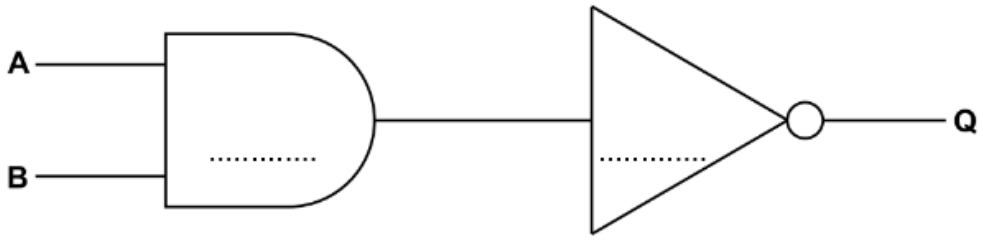


Fig. 2

(a) (i) Label the names of the two gates on the diagram above. [2]

(ii) Complete the truth table below to show the output from this logic system.

A	B	Q
0	0	
0	1	
1	0	
1	1	

[4]

(b) Draw the logic diagram represented by **Q = A OR (NOT B)**

[2]

7. The cars table below shows some data on the used cars that a car dealership has in stock.

CarID	Registration	Make	Type	Price	EngineSize
1	NF09 APY	Stanton	Hatchback	2500	1.4
2	SZ15 LUY	Fenwick	Saloon	4800	1.8
3	FQ55 ALW	Stanton	Hatchback	1700	2.1
4	SQ57 TTW	Fenwick	Estate	2300	2.8
5	NZ12 MBE	Stanton	Saloon	5200	1.8

(a) How many records and fields does this table have?

Records.....

Fields.....[2]

(b) Explain the difference between a record and a field.

.....

.....

.....

.....[2]

(c) Draw a table showing what would be returned by the following SQL command:

```
SELECT Make, Type
FROM cars
WHERE EngineSize= 1.8
```

[3]