

ELECTRONICS EXAM QUESTIONS

You may find the following information useful:

$$V = IR$$

$$P = VA$$

$$R_T = R1 + R2$$

$$R_T = \frac{R1 \times R2}{R1 + R2}$$

1,000,000	= Mega
1,000	= Kilo
1	-
0.001	= milli
0.000,001	= micro
0.000,000,001	= nano
0.000,000,000,001	= pico

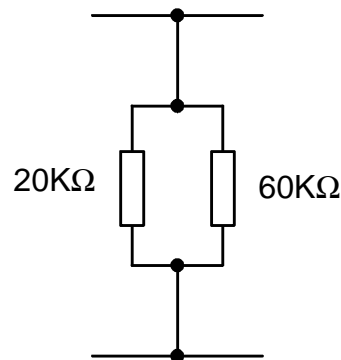
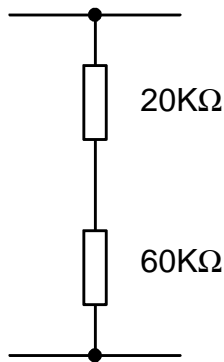
$$V_{out} = V_{in} \times \frac{R2}{R1 + R2}$$

$$I_c = I_b \times h_{fe}$$

Question 1

a) Work out the combined resistance of the two following resistor networks

[2]

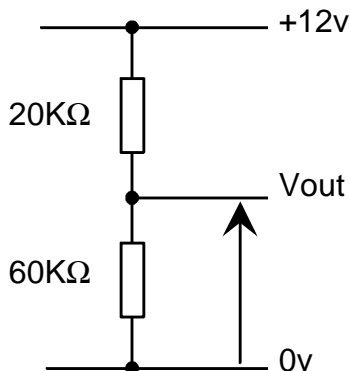


b) When both resistors are connected in series to produce a different voltage, what is this arrangement called?

[1]

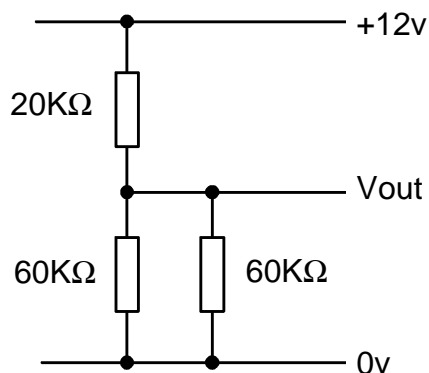
c) What voltage will be present at V_{out} ?

[2]

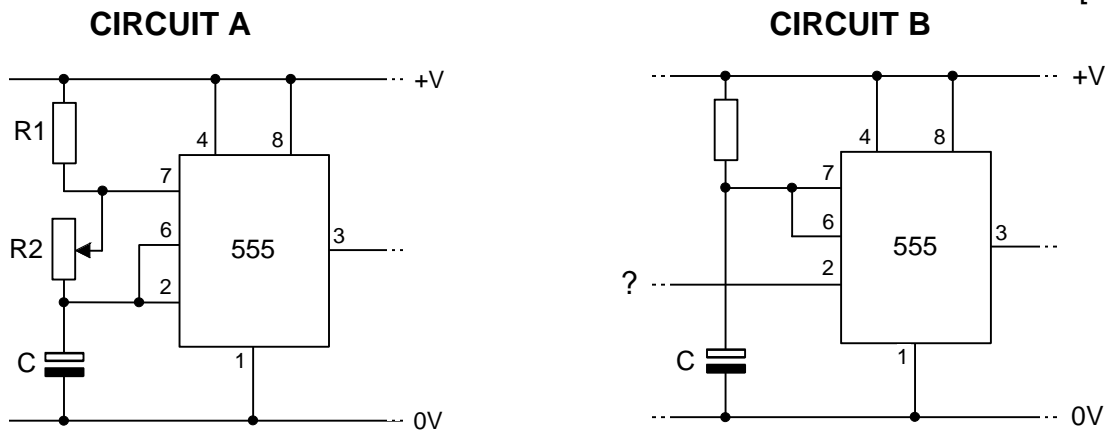


d) If another resistor is placed in parallel as shown, what voltage is now present at V_{out} ?

[2]

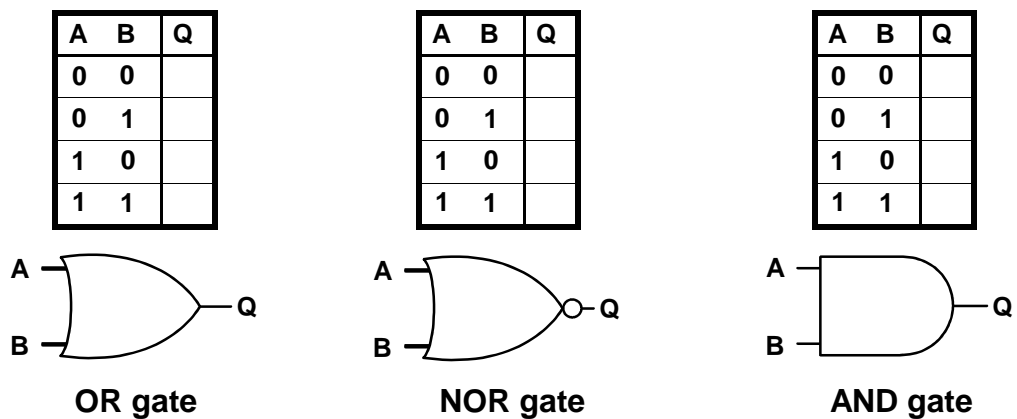


Question 2 a) Name the following circuits **and** explain what they do. [4]

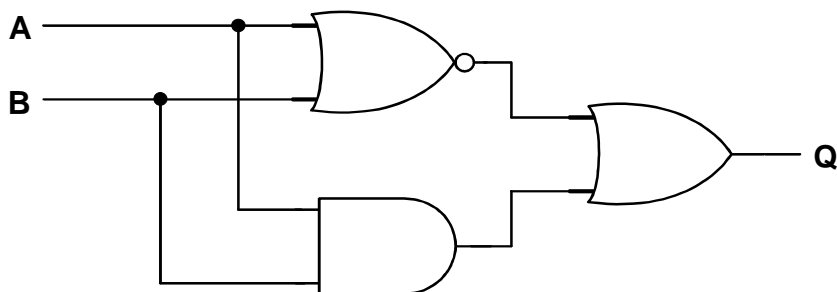


- b) In CIRCUIT A, what is the purpose of R2? [2]
- c) In CIRCUIT B, pin 2 would be connected to a push switch. What do you think is the purpose of this? [2]
- d) Which circuit would you use if you wanted to build an egg timer? [1]

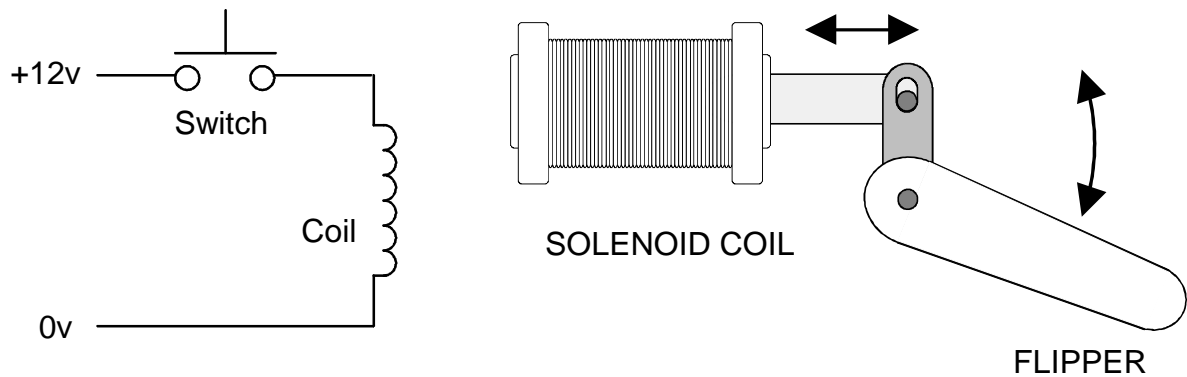
Question 3 a) Copy down the logic tables for the following logic gates, and complete them by filling in the correct outputs. [3]



b) The logic gates have been connected as follows. Write out another logic table for this logic circuit. [4]



Question 4 The flipper shown below is controlled by a solenoid. When a switch is pressed, the coil is energised and the flipper moves.



- a) The solenoid coil has a resistance of 24 ohms. How much current will flow through the solenoid when it is energised? [1]
- b) How much power will be used? [1]
- c) Redraw the circuit showing how you would connect an Ammeter to measure the current flowing through the coil. [1]
- d) Describe how a solenoid works. [2]

Question 5 Re-write the following values using multiple and sub-multiple units.

- a) 46,000 Volts
 - b) 0.000,000,003 Farads
 - c) 6800 Ohms
 - d) 0.003,672 Amps
- [4]

Question 6 a) Name the following 2 wave types

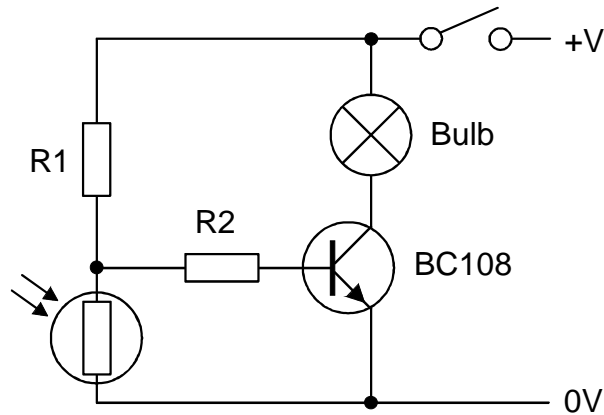


- b) Copy out wave B and indicate the MARK and the SPACE. [2]

Question 7

a) The following circuit is being used in a lighting project. Explain how this circuit works.

[2]



b) Why is the transistor needed?

[1]

c) The transistor has a *hfe* of 200. What does *hfe* mean?

[1]

d) The light bulb requires 600 mA to light properly. What must be the minimum base current be to achieve this? Show your working.

[2]

Question 8

Name the following components and draw their circuit symbols.

[8]

