

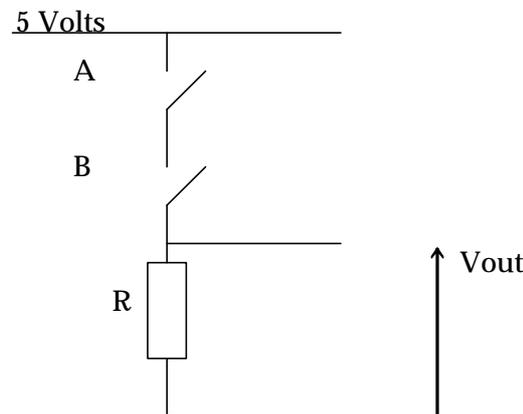
## Digital Electronics

### Answer Sheet 1

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1. Digital data can be transmitted and stored more efficiently and reliably than analog data. Also, digital circuits are simpler to implement and there is a greater immunity to noisy environments.
2.
  - a) Programmed control of timings of spin, wash, fill etc.
  - b) Control of interactive operation via screen and control buttons; calculations required by the game.
  - c) Generation of tones for dialling; automatic dialling from memorised numbers; (some models also use digital electronics for control of answerphone and LCD displays of call information).
  - d) Control of interactive operation via screen, keyboard and mouse; control and communication with peripheral devices like disk and printer; calculations required by the programmes; communication over the Local Area Network.

3.



When both switches are closed, Vout is 5 Volts. Otherwise Vout is 0 Volts.

If a "TRUE" input means closing a switch then a "TRUE" output is represented by 5 Volts.

4. a) rise time = 550ns, b) fall time = 600 ns, c) pulse width = 2.7  $\mu$ s, d) amplitude = 10V.
5. Serial transfer takes 8 bit time, i.e. 8  $\mu$ s.

Paralle transfer takes 1 bit time, i.e. 1  $\mu$ s.

Data transferred is: 01110101.