

Question 1: Careers**(7)**

Match each of the following abilities to their related career fields. Write only the letter (**in capitals**) next to each number (**e.g. 9. M**):

Career Field		Abilities	
1	Agriculture, Life Sciences and Environmental Science	A	Good listener and communicator. Does not easily feel burdened by other people's hardships.
2	Tourism and Hospitality services	B	Focused on detail, good in Maths and perseverance to solve difficult problems.
3	Law, Administration and Governance	C	Enjoys working outdoors, working with animals and physical activity.
4	Information Technology	D	Good in Maths, can work in teams, good with computers.
5	Engineering, Trades and Construction	E	Communicates well, good at debating and making policies.
6	Social Services	F	Good at working with other people, finds it easy to sell goods or services.
7	Business and Finance	G	Outgoing and has a flair for languages and different cultures.

Question 2: Constitutional rights and responsibilities**(6)**

Name any 3 constitutional rights found in the Bill of Rights as well as the responsibility linked to each of them.

1) Give a definition for the following:

Mechanical advantage.....

Spanning structure.....

Simple mechanism.....

Pneumatics.....

(4)

2) Write down three steps of the design process

(3)

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3) Case study: *The Merciless Alarm Clock*

An interesting design

The Merciless[®] Alarm Clock was invented by students of the Technical University of Wildau in Germany. It was exhibited to the public at the 2011 CeBIT High Tech Fair. This is the world's largest IT expo, where thousands of the latest gadgets are put on display.

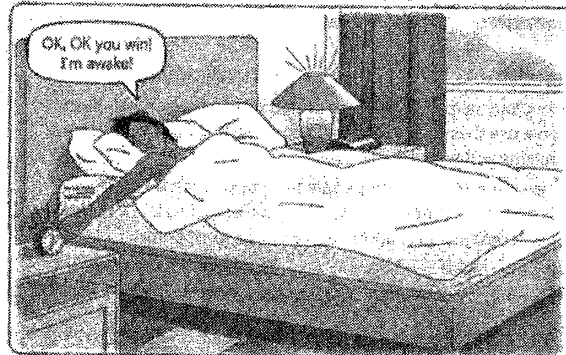


Figure 1.2 The sequences of the irritating alarm clock

How does this irritating alarm work?

- Step 1:** At the set time the curtains get instructed to open.
- Step 2:** Five minutes later the lights get turned on.
- Step 3:** Five minutes later the radio switches on loudly.
- Step 4:** Five minutes later the alarm makes a variety of random[®] irritating noises.
- Step 5:** You can only stop the alarm by standing on the sensor pad for five seconds.
- Step 6:** Now that you are awake it will make coffee.

(a) Describe the problem that made the students design and make the alarm clock.

(1)

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