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## **Design & Technology**

# Effects of technological developments

#### Materials required for questions

- Pencil
- Rubber
- Calculator

#### Instructions

- Use black ink or ball-point pen
- Try answer all questions
- Use the space provided to answer questions
- Calculators can be used if necessary
- For the multiple choice questions, circle your answer

#### Advice

- Marks for each question are in brackets
- Read each question fully
- Try to answer every question
- Don't spend too much time on one question

## **Good luck!**

**Q1.** What is the definition of a smart material?

- A A material that has been engineered to have additional properties
- **B** A material whose physical properties change in response to external stimuli
- **C** A material that is available in large sheets

#### Q2. Smart materials have?

- A Properties that can significantly change
- **B** Good conducting properties
- C Weak covalent bonds

Q3. Which of the following statements is false about mass production?

- A Increased sales/profits
- B consumers have less choice
- **C** cheaper materials can be used

Q4. Which of the following statements about technology is false?

- A Lithium-ion rechargeable batteries providing a lightweight means of storing a lot of energy resulting in thinner and fuel cells
- B Computers have resulted in slow-turn Around jobs
- C CIM systems incorporating CAD and CAM used in modern manufacturing

Q5. Outline the negative effects mass-production has had on employment (4 marks)

**Q6.** Built-in obsolescence has had a number of effects on society. Explain **two** positive effects built-in obsolescence has had on the consumer **(6 marks)** 

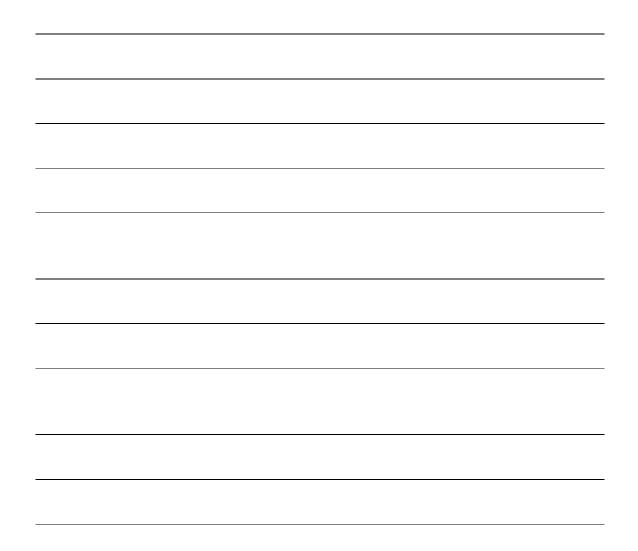


**Q7.** Many products are mass produced nowadays. Explain **two** benefits that mass production has had on employment. **(6 marks)** 

**Q8.** A new Tesla has been designed and is ready to enter the production phase. The company has two choices:

- Use a manufacturing facility in a first world country
- Use a manufacturing facility in a third world country

The facility will be the same regardless of its location. Discuss the factors that need to be considered when deciding where to manufacture the new car (9 marks)



#### Answers

- Q1. B
- Q2. A
- Q3. B
- Q4. B

#### Q5.

- Workers replaced by machines (1)
- Low job satisfaction/morale/self-pride in the work (1)
- Low wages (1)
- Poor quality living conditions/ poverty (1)
- Sweatshop employment/ long hours/ few breaks (women/children) (1)
- Poor/ unsafe/ bad working conditions (1)
- Uprisings/ strikes/ friction/ resentment (1)
- Unemployment/ less employment/ less demand for labour (1)

#### Q6.

1.

- Consumers buy up to date products/stay in fashion (1)
- Due to regular/frequent new releases (1)
- Increased customer satisfaction/pleasure (1)
- Consumers want to be seen with the latest product/one-upmanship (1)

#### 2.

- Consumers have a wider selection (1)
- Due to increased competitiveness between businesses (1)
- Leading to competitive prices (1)
- Can plan/budget for replacement (1)
- Increased second hand market (1)

3.

- Drives innovation/new/improved features/multi-function products are developed (1)
- Which can improve consumers quality of life (1)
- Improved safety features/consumers are safer (1)

Q7.

- Creates more jobs (1) giving employees a regular income/higher pay (1) increasing their quality of life. (1)
- Employers need skills (1) so employees are trained up (1) leading to greater job satisfaction/promotion (1)
- Established a need for health and safety laws (1) which were brought in by the government (1) making the work environment a safer place (1)
- Trade unions established (1) increasing the influence/power of employees (1) brining many employee benefits (sick pay, holidays, pensions etc.) (1)

#### Q8.

Students may refer to the following in their answer

- Available infrastructure
- Transportation costs/distance to market
- Availability of skilled workforce
- Workforce training
- Engineering expertise local/imported
- Cost benefits including low labour costs
- Public perception including ethics and exploitation
- Government incentives in host country
- Availability and price of development land
- Language barriers
- Exposure to volatile exchange rates
- Political instability of host nation
- Loss of jobs/skills
- Issues surrounding technical robotics expertise
- Labour related issues in host country
- Trade agreements and tariffs
- Availability/location of raw materials and components
- Benefits to the host nation
- Environmental considerations and regional legislation
- Health and safety legislation and employment law
- Just-in-time and issues surrounding border controls