**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** positiveeffects 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.**

* 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)
* 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)
* 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