

Design & Technology

Modelling the costing of projects to achieve optimum outcome

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
- Use a cross in the box to mark you 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 a cost that is not accounted for when budgeting a project

- A** Staff hours
- B** Machinery costs
- C** Unplanned expenses

Q2. When planning for a project budget why is it important to know the scale of production being used

- A** So the cost of manufacturing can be estimated
- B** So the machinery needed can be ordered in time
- C** So the timescale of the project is known

Q3. Which scale of production will have the highest set up costs

- A** One-off production
- B** Batch production
- C** Mass production

Q4. Modelling the cost of projects such as car manufacturing can be done completely by CAD software

- A** True
- B** True

Q5. Explain two advantages in terms of cost of using an automated closed loop control system, compared to an open loop control system, in production. **(2 marks)**

1.

2.

Q6. Evaluate the cost implications to a business of running effective quality control systems. **(6 marks)**

Q7. When planning for production there are areas that need to be considered such as the equipment available for scale of production.
Name 2 other areas that need to be considered **(2 marks)**

1. _____

2. _____

Q8. Name 3 costs that need to be considered when modelling the cost of a project **(3 marks)**

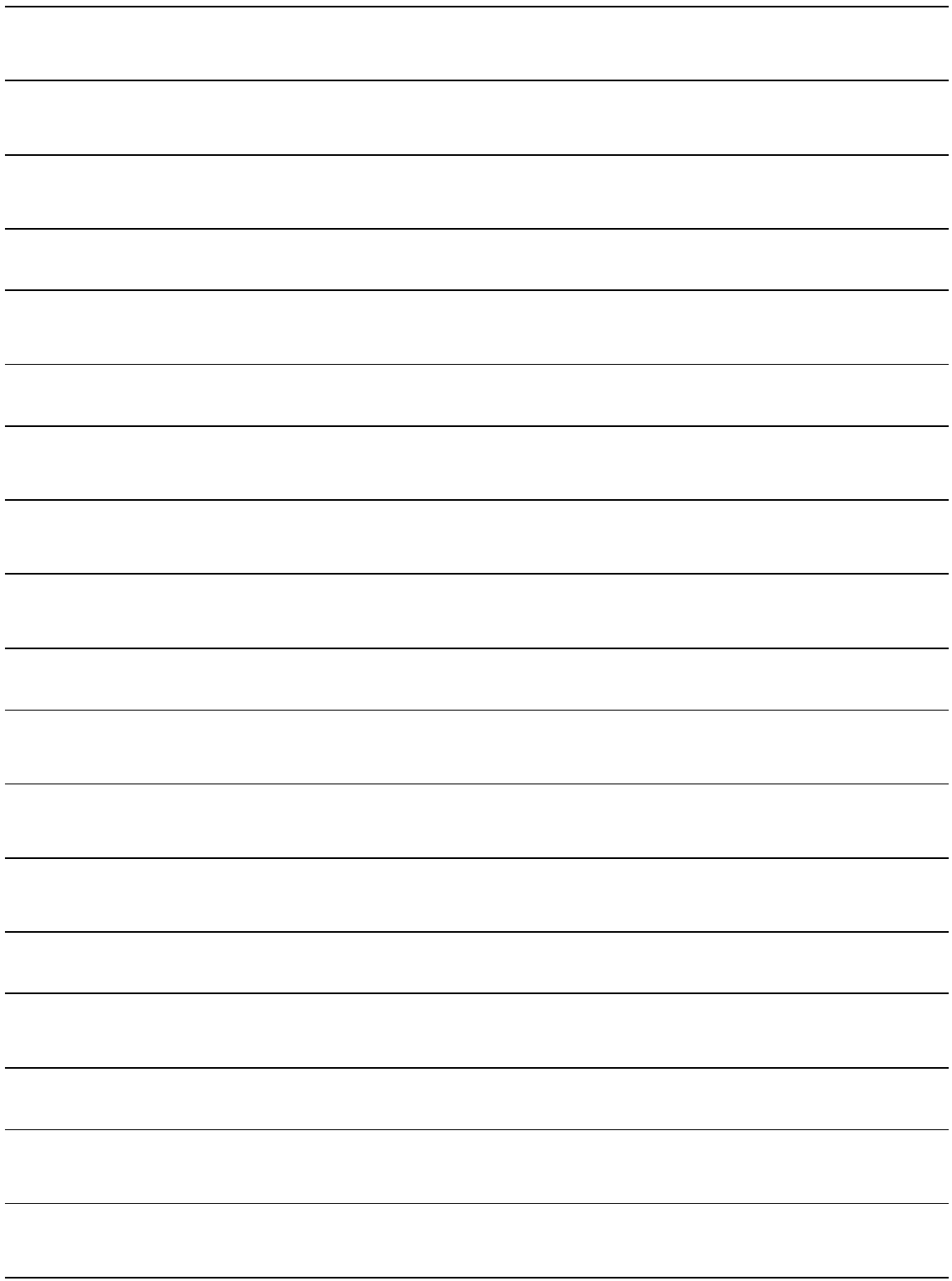
1. _____

2. _____

3. _____

Q9. Evaluate the decision to use injection moulding to create the drill body shown by the image below **(9 marks)**





Answers

Q1. C

Q2. A

Q3. C

Q4. A

Q5.

- Reduced labour/wages costs
- Increased/faster productivity/cost saving

Q6.

Any six of the following but must include one from each to gain full marks:

Negatives

- Running QC systems costs extra money /reduces profits. (1)
- Increases selling price / price themselves out of the market / competitor products are cheaper. (1)
- Set up costs eg. Equipment / training costs. (1)
- Running costs eg. Labour/ energy /maintenance/ destructive testing/ etc. (1)
- Slower production rate / time consuming / time needed to check every component / less products manufactured / sold. (1)

Positives

- High quality / more reliable products produced. (1)
- Good reputation/quality marks gained (BSI, ISO4000, etc). (1)
- Leading to increased profits /higher value product / increased sales / money saved. (1)
- Less returned products/ replacement products supplied. (1)
- Sampling / computer driven /automated monitoring systems are cheaper to run.(1)
- Increased QC checks will reduce the waste incurred when faulty goods are further processed/ faulty goods are disposed of / leads to increased productivity. (1)

Q7.

- Material costs (quality of product)
- Labour/Wages (automation vs high skilled)
- Premises

Do not accept Equipment available for scale of production

Q8.

- Start-up costs (legal/insurance/stock/advertising/permits/wages)
- Sales (predict sales)
- Expenses (wages/advertising/vehicles/accounting/legal fees)
- Cost of goods (COGS) (materials/packaging/transport/commission)
- Cash flow (tell you how much cash you're expecting/help make decisions)

Q9.

Candidates might refer to the following in their responses:

- the drill body has a thin wall section/complex shape and profile
- the body will be required in high volume
- the design requires cores/bushes/inserts/ components/fastenings.
- a range of colours can be offered
- cost of mould/skilled labour required
- speed of production
- energy costs
- environmental influences.

Expansion that can be used to justify judgments relating to positive or negative points:

- the form can be achieved with a highly complex mould
- does not need any additional surface finishing
- injection moulding process can deliver the product to consistent level of quality time after time/suitable for high volume/the body will need to fit other components so must be same every time
- cores/inserts/components/fastenings can easily be moulded into the drill body, which allows it to be produced in one process
- the initial cost of the mould is expensive, requiring high volume to recoup costs
- colour can be changed without need for additional moulds
- a fast process allowing rapid volume production
- the level of detail and craftsmanship/knowledge required to make the mould is expensive/limited number of people capable
- if the process is 24/7 then it is more efficient than a costly start-up period each day, but this must be weighed against 24/7 labour costs
- ambient temperature/viscosity changes/mould temperature variations are all factors that can have an adverse effect on the moulding process and need careful monitoring/environmental control systems.

Q10.

- Set-up costs (1)
- Material costs (1)
- Labour costs (1)
- Transportation costs (1)
- Training and development costs (1)
- Manufacturing costs (1)
- Overhead costs / facilities costs (1)
- Sales and marketing costs /market research (1)
- Production capacity (1)
- Market trends (1)
- Break even output (1)
- Product retail price / affordability (1)
- Quality (1)
- Market demand / expected production output (1)
- Storage costs (1)
- Packaging costs (1)
- Energy costs (1)
- Inflation impacting on costs (1)
- Profit forecasts and requirements (1)
- Government policies (1)
- Long term aims and objectives (1)
- Contingencies / allowance for unexpected events (1)