

Design & Technology

AQA A-Level

Quality assurance

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 main goal of a quality assurance system in manufacturing?

- A** To speed up mass production only
- B** To ensure products meet quality standards and reduce waste
- C** To avoid using trained staff during inspection

Q2. Which of the following is a key feature of Total Quality Management (TQM)?

- A** Only management staff are responsible for quality
- B** Quality checks are ignored during early stages
- C** Everyone in the organisation is responsible for quality

Q3. What is the main purpose of Six Sigma?

- A** To reduce the use of sustainable materials
- B** To eliminate variation and improve process quality
- C** To shorten the design stage

Q4. How does Scrum help in product development?

- A** It ensures work is completed in short, reviewable cycles
- B** It guarantees production at maximum speed
- C** It is only used in large factories

Q5. Give four effective uses of project management systems that can benefit designers and manufacturers **(4 marks)**

1.

2.

3.

4.

Q6. State four ways a manufacturer may use quality assurance procedures and policies to reduce the rate of errors during die cutting of packaging nets **(4 marks)**

1.

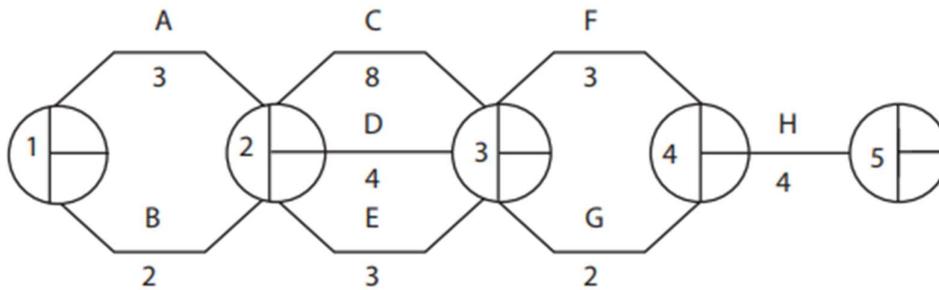
2.

3.

4.

Q7. Define the term Total Quality Management (TQM) (2 marks)

Q8. Innocent Drinks has constructed the network diagram below to plan the launch of a new line of smoothies. Each number represents how many days each activity is estimated to take.



Using the data in the network diagram above, calculate the Earliest Start Times (EST) and Latest Finishing Times (LFT) for each activity and identify the critical path. (4 marks)

Answers

Q1. B

Q2. C

Q3. B

Q4. A

Q5.

Project management systems benefit designers and manufacturers by:

- Project management systems, such as Six Sigma are used in identifying areas of weakness/waste within a process.
- By using project management systems, such as Critical Path Analysis (CPA) designers and manufacturers can streamline processes removing unnecessary stages.
- Manufacturers can reduce waste production by making to order.
- By involving all members of a design/manufacture team in decisions TQM can increase efficiency: reducing processing time, reducing movement within the production process, reducing process equipment.
- Project management systems can also improve supply efficiencies between manufacturers

Q6.

- Setting material quality tolerances (moisture levels on supplied materials)
- Set regular intervals for blade changes to avoid blunt edges
- Set tolerances for cutting blade pressures
- Set appropriate material thickness tolerances
- Set regular blade alignment checks
- Regular staff training
- Setting regular visual inspections
- Simulating production runs prior to manufacture
- Only accepting supplies from companies conforming to ISO9001

Q7.

1 mark for reference to TQM being a method for improvement of QA or production processes

1 mark for information regarding the responsibility/involvement of all members of the workforce/company.

- TQM refers to continuous improvement within a company. This continuous improvement is the responsibility of all members of the company/organisation at all levels.

Q8.

Circle 1: top 0, bottom 0

Circle 2: top 3, bottom 3

Circle 3: top 11, bottom 11

Circle 4: top 14, bottom 14

Circle 5: top 18, bottom 18 (to be entered on a diagram)

1 mark for correct calculation of all ESTs for each node

1 mark for correct calculation of all LFTs for each node

1 mark for identification of critical path A, C, F and H