

Answers and marking guidance

Award one mark per correct, developed point unless stated. Other valid answers should be credited.

2 Outline three benefits of 3D printing when producing products.

- No tooling or moulds needed
- Complex forms and moving parts in one print
- Prints directly from a CAD file
- Easy to change the design and reprint
- Additive, so little waste
- Good for one-off or customised parts

No marks for: Unqualified "quick", "cheap", "easy"; Vague environmental claims

3 Quick check

- a) Acrylic earrings with intricate cut-outs
- b) High initial investment and training
- c) Brown scorch marks
- d) No moulds are needed so changes are low cost and quick

4 Key terms

- 1 – B
- 2 – A
- 3 – C
- 4 – D

5 Explain the benefits of using CAD in the development of products such as the bike frame.

- Stress analysis tests the frame virtually, reducing physical testing
- Changes are quick to make without redrawing
- Library of standard parts (bolts, bearings) saves time
- Renders show the client realistic colours and finishes
- Files shared instantly with the team, even abroad
- Files sent straight to rapid prototyping or CNC

No marks for: Benefits of CAM rather than CAD; Generic "accurate" with no explanation

6 Describe one benefit of 3D printing.

- Complex forms with no tooling; easy to change; low waste.

7 Describe one drawback of 3D printing.

- Slow and limited materials; not economic for high volumes.