

Design & Technology

Edexcel GCSE

Cams and Followers

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. Which component has a shaped edge that pushes a follower up and down as it rotates?

- A** Cam
- B** Gear
- C** Pulley

Q2. A cam and follower converts

- A** linear motion into rotary motion
- B** rotary motion into reciprocating motion
- C** oscillating motion into linear motion

Q3. Which type of cam can only rotate in one direction?

- A** Eccentric cam
- B** Pear-shaped cam
- C** Snail cam

Q4. Which type of follower wears most quickly?

- A** Knife-edge
- B** Roller
- C** Flat-foot

Q5. What is meant by "dwell" in a cam mechanism?

- A** The follower moves up
- B** The follower stays still
- C** The follower drops suddenly

Q6. Which cam gives a smooth, continuous rise and fall with no dwell?

- A** Pear-shaped cam
- B** Snail cam
- C** Eccentric cam

Q7. An automata toy caterpillar uses a cam mechanism to move.

Q7a. State the function of the cams on the automata toy. **(1 mark)**

Q7b. One of the cams is pear-shaped. Describe the motion produced by a pear-shaped cam. **(2 marks)**

Q8. A cam and follower are part of the mechanism that moves the feet of a wind-up bath toy.

Describe how a cam and follower works. You can use sketches and notes to support your answer. **(2 marks)**

Answers

Q1. A

Q2. B

Q3. C

Q4. A

Q5. B

Q6. C

Q7a.

One from (1 mark): to create movement up and down; converts rotational motion into linear motion.

Q7b.

Marks only for describing the motion of a pear-shaped cam, not other cams (e.g. snail). For example:

- A pear-shaped cam creates a sudden rise and fall (1), followed by a long period where the follower does not move (1)
- The follower remains motionless for about half of the cycle of the cam (1), and during the second half it rises and falls (1)

Credit any other appropriate response.

Q8.

Up to two marks for a description or annotated sketch of how a cam and follower works, e.g.:

- The follower follows the edge of the cam
- The cam is shaped (eccentric, offset or pear shape)
- As the cam rotates, the follower moves up and down
- They convert rotary motion into reciprocating motion

Award credit for any other appropriate response.