

MA2024 – Engineering Materials and Manufacturing Processes

CA2

Student Name:

Tutorial Group:

Marks:

For each of the ten questions, please write your answer (A, B, C or D) in the table below:

1	2	3	4	5	6	7	8	9	10
A	A	C	A	C	D	B	D	D	C

There is only one correct answer per question.

All the questions carry equal marks.

Answer all the questions.

No penalty for wrong answer.

1. Which type of the chips usually results in the best surface finish?

- (A) Continuous chip;
- (B) Discontinuous chip;
- (C) Serrated chip;
- (D) Build-up edge.

A

2. In sand casting, upper half of mould is called

- (A) Cope;
- (B) Drag;
- (C) Flask;
- (D) Die.

A

3. The figure below shows:

- (A) Subtractive manufacturing;
- (B) 3D printing;
- (C) Additive manufacturing;
- (D) Formative manufacturing.

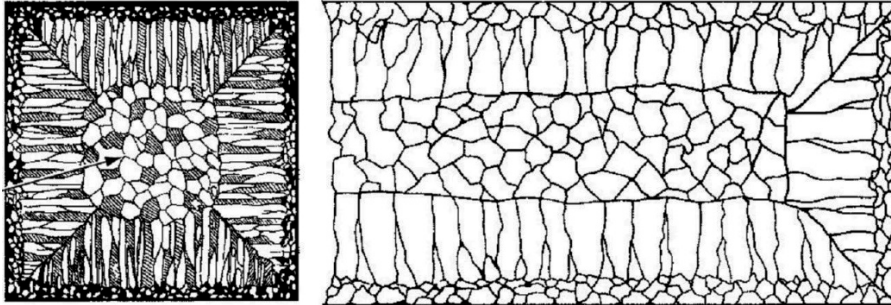
C



4. The figure below is likely to show cast structures of

- (A) An alloy;
- (B) A pure metal;
- (C) Either an alloy or a pure metal;
- (D) Not possible to tell.

A



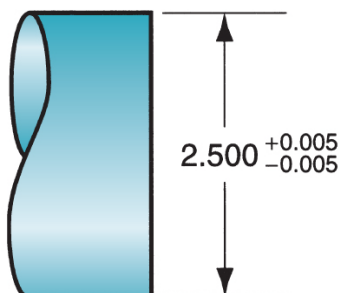
5. Solidification shrinkage cavities are **not a big problem** for

- (A) Pure aluminium;
- (B) Aluminium alloy;
- (C) Cast iron;
- (D) Zinc alloy.

6. The tolerance shown in the following figure is

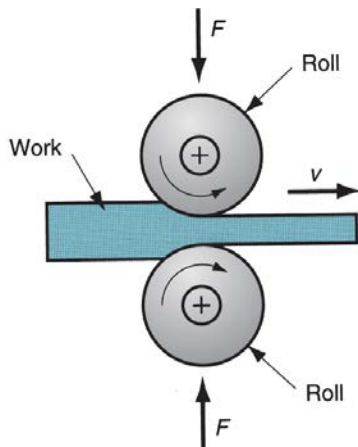
- (A) 0.005 mm;
- (B) -0.005 mm;
- (C) 2.500 mm;
- (D) 0.01 mm.

D



$$\begin{array}{r}
 2.505 \\
 - 2.495 \\
 \hline
 0.010
 \end{array}$$

7. The figure below shows
 (A) Extrusion process;
 (B) Rolling process;
 (C) Additive manufacturing process;
 (D) Drawing process.



B

8. A part is to be bent into shape as shown below. The material has a tensile strength of 400 MPa. It is bent into a 90° angle in a V-die. The length of the starting blank is 76 mm and the width is 38 mm. Find the bending force, P, given that

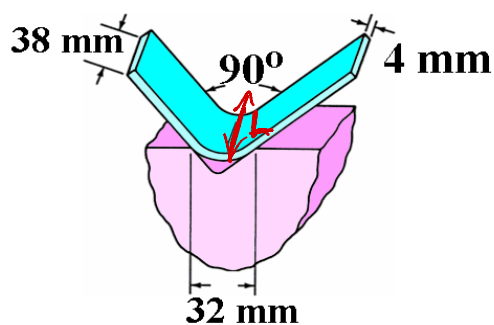
$$P = \frac{1.33(UTS)LT^2}{W}$$

- (A) 20.216 kN;
 (B) 1010.8 N;
 (C) 4.224 kN;
 (D) 10.108 kN.

$$P = \frac{1.33(400 \times 10^3) \times 76 \times 4}{32}$$

$$= 10108 \text{ N}$$

$$\approx 10.108 \text{ kN}$$



9. Which of the following statements is false about deep drawing?
 (A) As t/D_b decreases, tendency for wrinkling increases;
 (B) Earing is due to anisotropy of the blank material;
 (C) Tearing is due to high tensile stresses that cause thinning and failure;
 (D) As blankholder force increases, tendency for wrinkling increases.

D

10. In which of the following welding and joining processes filler material is never used?

(A) Oxyacetylene welding; ✕

(B) Laser welding;

(C) Explosive welding;

(D) Brazing.

C