

## SAMPLE ENTRANCE EXAM TEST QUESTIONS - PART 1

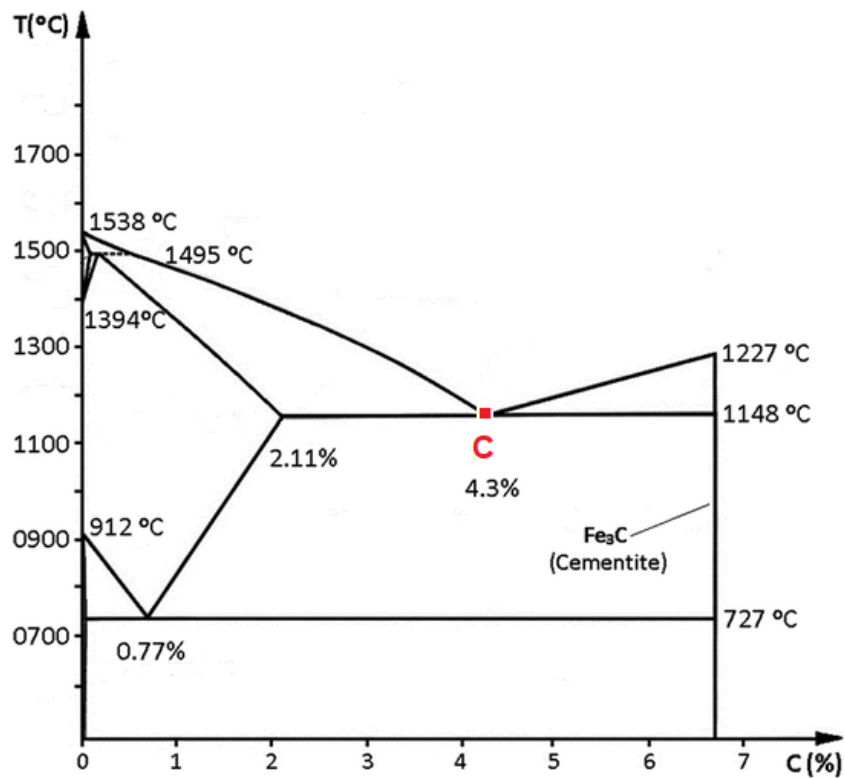
(Material science, Engineering technology and Machine components)

## Question 1

Not complete

Marked out of 2.50

Point C in the Metastable Iron-Carbon (Fe-C) Phase diagram expresses:



Select one:

- ☐ a. eutectic point
- ☐ b. point of maximum solubility of carbon in austenite
- ☐ c. eutectoid point
- ☐ d. point with maximum solubility of carbon in ferrite

Check

## Question 2

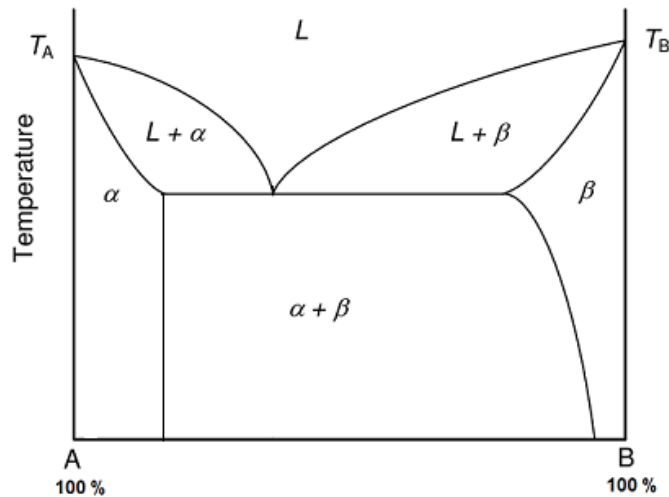
Iron-carbon alloys containing 2.14 to 4.3 % carbon are known as:

Select one:

- ☐ a. hypo-eutectic cast irons
- ☐ b. hyper-eutectic cast irons
- ☐ c. eutectic cast irons
- ☐ d. steels

**Question 3**

In the figure below, the solid solution with decreasing solubility of the ingredients while cooling corresponds to:



Select one:

- a.  $\alpha$
- b.  $\beta$
- c.  $\alpha + \beta$
- d.  $\alpha + L$

**Question 4**

Broaching tools are not used in piece production because:

Select one:

- a. the productivity of these tools is low
- b. tool adjustment takes a long time
- c. price of the tool is high
- d. sharpening blunted tools is difficult

**Question 5**

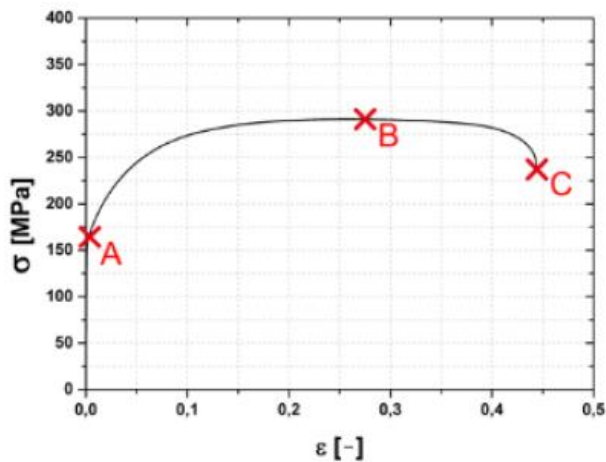
During which machining method loose abrasive grains are used?

Select one:

- a. lapping
- b. superfinishing
- c. honing

## Question 6

According to the shape of the given stress-strain curve for steel (see figure) is evident that this diagram is termed as:



Select one:

- a. load-extension diagram
- b. engineering diagram
- c. true diagram

## Question 7

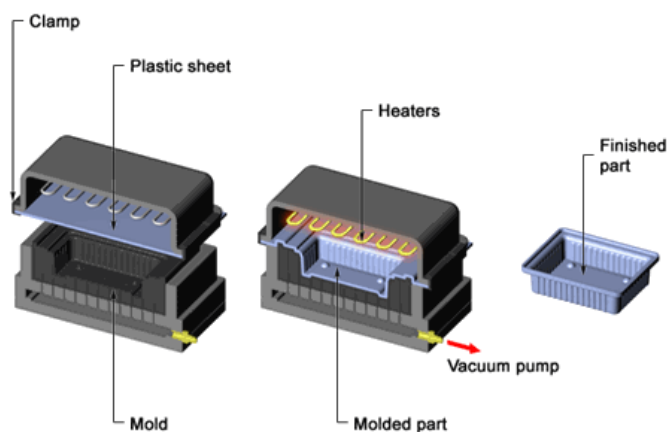
Strain rate during metal forming can be defined as:

Select one:

- a. the derivative of the true strain with respect to elongation
- b. the derivative of the elongation with respect to time
- c. the derivative of the true strain with respect to time
- d. the derivative of the elongation with respect to true strain

## Question 8

The final plastic part in the picture cannot be made from:



Select one:

- a. polyamide (PA)
- b. low density polyethylene (PE-LD)
- c. high density polyethylene (PE-HD)
- d. phenol formaldehyde resins (PF)

#### Question 9

**Clearance fit D9/h9 (in the ISO shaft basis system) presents:**

Select one:

- a. very close clearances for precise accuracy requirements, which can be assembled without force and will turn & slide when lubricated, e.g., precise guiding of shafts
- b. minimal clearances for high accuracy requirements, which can be easily assembled and will turn & slide freely, e.g., guiding of shafts, sliding gears, crankshaft journals
- c. small clearances with moderate requirements for accuracy, e.g., moderate running speeds and journal pressures, shafts, spindles, sliding rods
- d. large clearance where accuracy is not essential and involves high running speeds, large temperature variations, or heavy journal pressures

#### Question 10

**You have two surfaces that are the same distance from each other at all points. Select the proper geometric tolerance.**

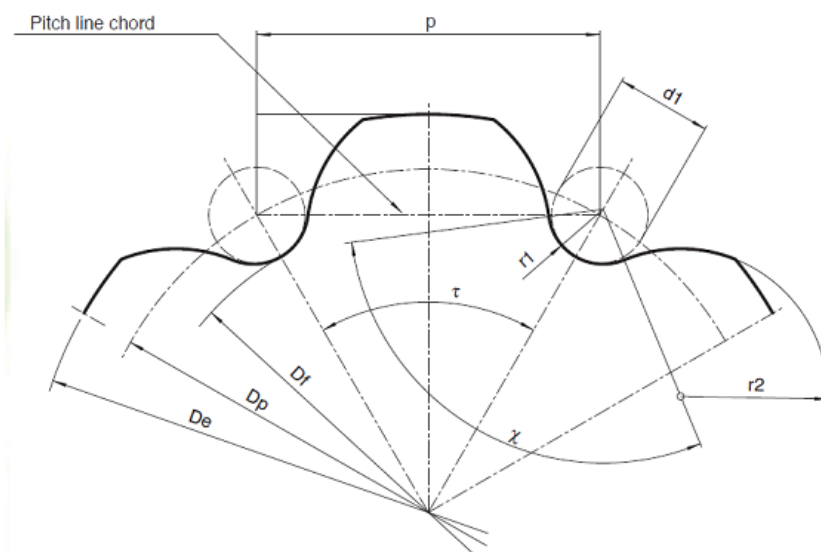
Select one:

- a. angularity
- b. symmetry
- c. perpendicularity
- d. parallelism

#### Question 11

**How big is the Pitch Diameter of a sprocket ( $D_p$ )?**

( $z$  – number of teeth;  $p$  – chain pitch)



Select one:

- a.  $Dp = p \cdot \cos \frac{180^\circ}{z}$
- b.  $Dp = p \cdot \sin \frac{180^\circ}{z}$
- c.  $Dp = \frac{p}{\cos \frac{180^\circ}{z}}$
- d.  $Dp = \frac{p}{\sin \frac{180^\circ}{z}}$

### Question 12

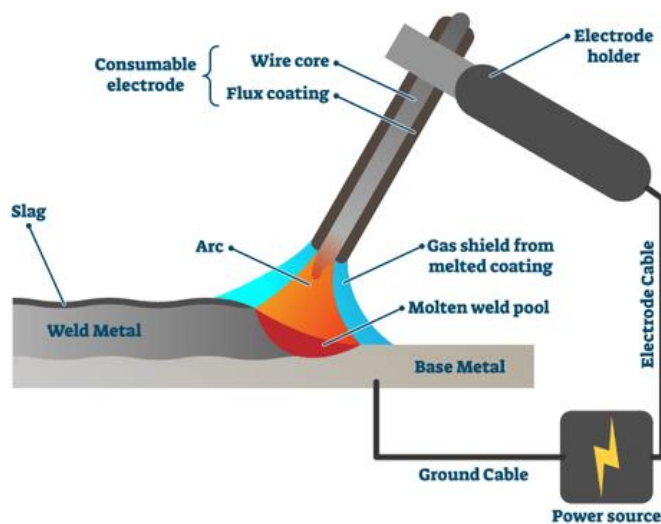
What is the most important condition for fully functional preloaded fasteners under dynamic loading?

Select one:

- a. to increase stiffness of bolt
- b. to preload the bolt
- c. to decrease stiffness of bolt
- d. increase stiffness of connecting material

### Question 13

Which welding method is shown in the picture?



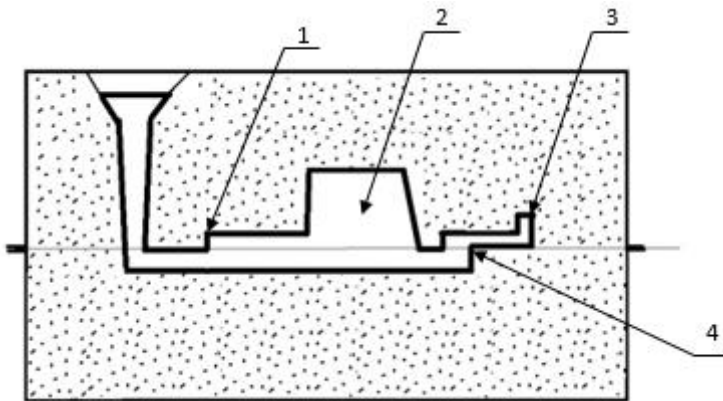
Select one:

- a. stick welding
- b. tungsten inert gas welding (TIG)
- c. metallic inert gas welding (MIG)
- d. gas metal arc welding (GMAW)

**Question 14****What is Duralumin?**

Select one:

- a. aluminium alloy with magnesium and silicone
- b. alloy made from aluminium and zinc
- c. alloy traditionally composed of aluminium, copper and tin
- d. alloy made from aluminium, copper and magnesium

**Question 15****There is a foundry mould shown in the figure – misrun will most likely form in location number:**

Select one:

- a. 1
- b. 2
- c. 3
- d. 4

**Question 16****In which of the following types of castings is the molten metal allowed to solidify up to the required thickness?**

Select one:

- a. slush casting
- b. permanent mould casting
- c. semi-permanent mould casting
- d. die casting