

Metal Forging



Reference books

○For GATE

Manufacturing Science

By Gosh and Mallik

○For IES

Manufacturing Engineering and Technology

By kalpak jain

**IES – 1993,
GATE-1994(PI)**

Which one of the following manufacturing processes requires the provision of ‘gutters’?

- (a) Closed die forging**
- (b) Centrifugal casting**
- (c) Investment casting**
- (d) Impact extrusion**

**IES – 1993,
GATE-1994(PI)**

Which one of the following manufacturing processes requires the provision of ‘gutters’?

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- (b) Centrifugal casting**
- (c) Investment casting**
- (d) Impact extrusion**

IES – 1997

Assertion (A): In drop forging besides the provision for flash, provision is also to be made in the forging die for additional space called gutter.

Reason (R): The gutter helps to restrict the outward flow of metal thereby helping to fill thin ribs and bases in the upper die.

- (a) Both A and R are individually true and R is the correct explanation of A
- (b) Both A and R are individually true but R is not the correct explanation of A
- (c) A is true but R is false
- (d) A is false but R is true

IES – 1997

Assertion (A): In drop forging besides the provision for flash, provision is also to be made in the forging die for additional space called gutter.

Reason (R): The gutter helps to restrict the outward flow of metal thereby helping to fill thin ribs and bases in the upper die.

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IES – 1998

Which one of the following processes is most commonly used for the forging of bolt heads of hexagonal shape?

- (a) Closed die drop forging**
- (b) Open die upset forging**
- (c) Close die press forging**
- (d) Open die progressive forging**

IES – 1998

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- (c) Close die press forging**
- (d) Open die progressive forging

IES – 2001

In the forging operation, fullering is done to

- (a) Draw out the material**
- (b) Bend the material**
- (c) Upset the material**
- (d) Extruding the material**

IES – 2001

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IES – 2003

A forging method for reducing the diameter of a bar and in the process making it longer is termed as

- (a) Fullering (b) Punching**
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IES – 2003

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IES – 2011

Which of the following processes belong to forging operation ?

- 1. Fullering**
- 2. Swaging**
- 3. Welding**

- (a) 1 and 2 only**
- (b) 2 and 3 only**
- (c) 1 and 3 only**
- (d) 1, 2 and 3 only**

IES – 2011

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IES – 2011

The process of removing the burrs or flash from a forged component in drop forging is called:

- (a) Swaging (b) Perforating
(c) Trimming (d) Fettling

IES – 2011

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- (a) Swaging (b) Perforating
(c) **Trimming** (d) Fettling

IES – 2002

Consider the following steps involved in hammer forging a connecting rod from bar stock:

1. Blocking 2. Trimming
3. Finishing 4. Fullering 5. Edging

Which of the following is the correct sequence of operations?

- (a) 1, 4, 3, 2 and 5
- (b) 4, 5, 1, 3 and 2
- (c) 5, 4, 3, 2 and 1
- (d) 5, 1, 4, 2 and 3

IES – 2002

Consider the following steps involved in hammer forging a connecting rod from bar stock:

1. Blocking 2. Trimming
3. Finishing 4. Fullering 5. Edging

Which of the following is the correct sequence of operations?

- (a) 1, 4, 3, 2 and 5
- (b) 4, 5, 1, 3 and 2**
- (c) 5, 4, 3, 2 and 1
- (d) 5, 1, 4, 2 and 3

IES – 2003

Consider the following steps in forging a connecting rod from the bar stock:

1. Blocking
2. Trimming
3. Finishing
4. Edging

Select the correct sequence of these operations using the codes given below:

Codes:

- (a) 1-2-3-4 (b) 2-3-4-1
(c) 3-4-1-2 (d) 4-1-3-2

IES – 2003

Consider the following steps in forging a connecting rod from the bar stock:

1. Blocking
2. Trimming
3. Finishing
4. Edging

Select the correct sequence of these operations using the codes given below:

Codes:

- (a) 1-2-3-4 (b) 2-3-4-1
(c) 3-4-1-2 (d) 4-1-3-2

• IES – 1994, ISRO-2010 •

In drop forging, forging is done by dropping

- (a) The work piece at high velocity**
- (b) The hammer at high velocity.**
- (c) The die with hammer at high velocity**
- (d) a weight on hammer to produce the requisite impact.**

IES – 1994, ISRO-2010

- In drop forging, forging is done by dropping
- (a) The work piece at high velocity
 - (b) The hammer at high velocity.
 - (c) The die with hammer at high velocity**
 - (d) a weight on hammer to produce the requisite impact.

IES-2011

Consider the following statements :

1. Any metal will require some time to undergo complete plastic deformation particularly if deForging metal has to fill cavities and corners of small radii.

2. For larger work piece of metals that can retain toughness at forging temperature it is preferable to use forge press rather than forge hammer.

- (a) 1 and 2 are correct and 2 is the reason for 1
- (b) 1 and 2 are correct and 1 is the reason for 2
- (c) 1 and 2 are correct but unrelated
- (d) 1 only correct

IES-2011

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1. Any metal will require some time to undergo complete plastic deformation particularly if deForging metal has to fill cavities and corners of small radii.

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(b) 1 and 2 are correct and 1 is the reason for 2

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(d) 1 only correct

IES-2005

Match List I (Type of Forging) with List II (Operation) and select the correct answer using the code given below the Lists:

List I

A. Drop Forging

B. Press Forging

C. Upset Forging

D. Roll Forging

A B C D

(a) 4 1 2 3

(c) 4 2 1 3

List II

1. Metal is gripped in the dies and pressure is applied on the heated end

2. Squeezing action

3. Metal is placed between rollers and pushed

4. Repeated hammer blows

A B C D

(b) 3 2 1 4

(d) 3 1 2 4

IES-2005

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List I

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D. Roll Forging

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(b) 3 2 1 4

(d) 3 1 2 4

IES-2013

Statement (I): In high velocity Forging process, high energy can be transferred to metal with relatively small weight.

Statement (II): The kinetic energy is the function of mass and velocity.

(a) Both Statement (I) and Statement (II) are individually true and Statement (II) is the correct explanation of Statement (I)

(b) Both Statement (I) and Statement (II) are individually true but Statement (II) is not the correct explanation of Statement (I)

(c) Statement (I) is true but Statement (II) is false

(d) Statement (I) is false but Statement (II) is true

IES-2013

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IES-2008

The balls of the ball bearings are manufactured from steel rods. The operations involved are:

1. Ground
2. Hot forged on hammers
3. Heat treated
4. Polished

What is the correct sequence of the above operations from start?

- (a) 3-2-4-1 (b) 3-2-1-4
(c) 2-3-1-4 (d) 2-3-4-1

IES-2008

The balls of the ball bearings are manufactured from steel rods. The operations involved are:

1. Ground
2. Hot forged on hammers
3. Heat treated
4. Polished

What is the correct sequence of the above operations from start?

- (a) 3-2-4-1 (b) 3-2-1-4
(c) 2-3-1-4 (d) 2-3-4-1

IES-2013

Consider the following statements pertaining to the open-die forging of a cylindrical specimen between two flat dies:

1. Lubricated specimens show more surface movement than un-lubricated ones.
2. Lubricated specimens show less surface movement than un-lubricated ones.
3. Lubricated specimens show more barreling than un lubricated ones.
4. Lubricated specimens shows less barreling than un lubricated ones.

Which of these statements are correct?

- (a) 1 and 3 (b) 1 and 4 (c) 2 and 3 (d) 2 and 4

IES-2013

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2. Lubricated specimens show less surface movement than un-lubricated ones.
3. Lubricated specimens show more barreling than un lubricated ones.
4. Lubricated specimens shows less barreling than un lubricated ones.

Which of these statements are correct?

- (a) 1 and 3 **(b) 1 and 4** (c) 2 and 3 (d) 2 and 4

Thank You



IMPORTANT POINTS

- Welding is a positive process.
- Machining is a negative process.
- Forming is a zero process.
- Weldability is the capacity of being welded into inseparable joints having specified properties such as definite weld strength, proper structure etc. It depends upon (1) Melting point (2) Thermal conductivity (3) Thermal expansion (4) Surface condition (5) Change in Micro structure etc.

According to thickness of plate when thickness of

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