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*"There is  
nothing  
impossible to  
they who will  
try."*



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# GATE 2023 RESULT



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<b>AIR</b> <b>03</b> <b>ME</b> KUSHAGRA DUTT	<b>AIR</b> <b>05</b> <b>PI</b> HARSHIT KUMAR	<b>AIR</b> <b>07</b> <b>ME</b> RUSHI PRADIPKUMAR KARIYA	<b>AIR</b> <b>11</b> <b>CE</b> VINEET JAIN	<b>AIR</b> <b>30</b> <b>CE</b> DITIK BANSAL	<b>AIR</b> <b>36</b> <b>ECE</b> SURIT KUMAR
<b>AIR</b> <b>64</b> <b>CE</b> UTKARSH MISHRA	<b>AIR</b> <b>71</b> <b>EE</b> SONESH SANJAY PAWAR	<b>AIR</b> <b>76</b> <b>CE</b> DIPANKAR DAS	<b>AIR</b> <b>87</b> <b>EC</b> SURAJIT RABI DAS	<b>AIR</b> <b>91</b> <b>EE</b> RISHABH GUPTA	<b>AIR</b> <b>111</b> <b>ES</b> ANIL GUPTA
<b>AIR</b> <b>130</b> <b>EE</b> SAURAV PATEL	<b>AIR</b> <b>136</b> <b>CE</b> RUPESH SACHDEVA	<b>AIR</b> <b>200</b> <b>ECE</b> WASIUZZAMA	<b>AIR</b> <b>212</b> <b>IN</b> WASIUZZAMA	<b>AIR</b> <b>217</b> <b>ME</b> VISHAL KUMAR	<b>AIR</b> <b>219</b> <b>ME</b> RITESH KUMAR
<b>AIR</b> <b>258</b> <b>EE</b> MANAV	<b>AIR</b> <b>348</b> <b>EE</b> AMAN NAMDEV	<b>AIR</b> <b>392</b> <b>EE</b> CAURAV MAHAJAN	<b>AIR</b> <b>403</b> <b>EC</b> MOHAN KUMAR SINGH	<b>AIR</b> <b>567</b> <b>EE</b> SHANKAR JHA	<b>AIR</b> <b>571</b> <b>ME</b> VIJENDER MEENA



# You Tube Classes Schedule



## MECHANICAL ENGINEERING

EXAM TARGET	SUBJECT	TIME	FACULTY
ALL PSUs	ENGINEERING MATHS	10:00 AM	ANANT SIR
ALL PSUs	PRODUCTION	11:30 AM	GAURAV SIR ✓
ALL PSUs	THERMODYNAMICS	3:00 PM	KANISTH SIR ✓
GATE 2024-25	HMT	4:30 PM	YOGESH SIR
GATE 2024-25	SOM	9:00 PM	MUKESH SIR



# FREE APP CLASS SCHEDULE



## MECHANICAL ENGINEERING



<b>HMT</b>	MONDAY Live @11AM	YOGESH SIR
<b>PRODUCTION</b>	TUESDAY Live @11AM	GAURAV SIR
<b>SOM</b>	WEDNESDAY Live @8PM	MUKESH SIR
<b>THERMODYNAMICS</b>	THURSDAY Live @11AM	KANISTH SIR
<b>ENGINEERING MATHEMATICS</b>	FRIDAY Live @11AM	ANANT SIR





\* Fe-C  $\rightarrow$   $\alpha, \delta, \gamma$   $\rightarrow$  Equilibrium

\* TTT  $\rightarrow$  Non-Equilibrium

Which of the following statements is correct ?

- (a) Iron-carbon and TTT diagrams are both equilibrium diagrams.
- (b) Iron-carbon and TTT diagrams are both non-equilibrium diagrams.
- (c) Iron-carbon diagram is an equilibrium diagram but TTT diagram is a non-equilibrium diagram
- (d) Iron carbon diagram is a non-equilibrium diagram but TTT diagram is an equilibrium diagram.

Consider the following statements :

1. ✓ Heat treatment is effective only in case of certain alloys.
2. Cooling rate is an important factor in any heat treatment process.
3. ✓ The temperature at which the change starts on heating the steel is called lower critical temperature.

Which of the above statements are correct?

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



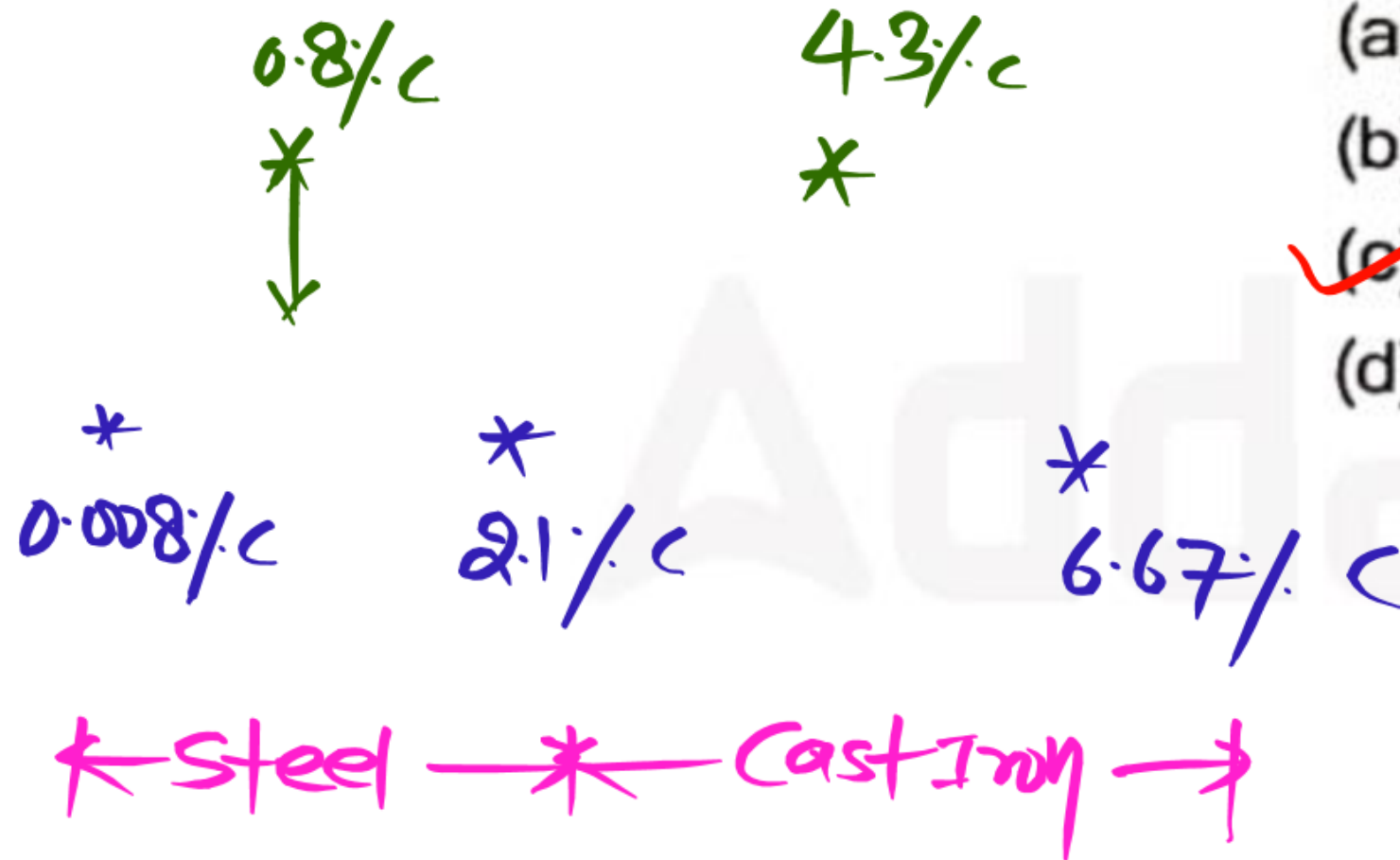
At room temperature,  $\alpha$ -iron contains negligible amount of carbon, cementite contains 6.67% C and pearlite contains 0.8% C. Pearlite contains how much cementite?

- (a) 8% (b) 10%  
(c) 12% (d) 14%

When steel containing less than 0.85% carbon is cooled slowly below the lower critical point, it contains

- (a) Ferrite mainly
- (b) Pearlite mainly
- (c) Ferrite and pearlite
- (d) Pearlite and cementite

$(\alpha + Fe_3C)$





The correct order of cooling media for decreasing cooling rate is:

(a) Air, Water, Oil and Fused salt ~~X~~

(b) Water, Air, Fused salt and Oil ~~X~~

(c) Oil, Fused salt, Air and Water ~~X~~

(d) Water, Oil, Fused salt and Air

Case Hardening

↓  
Surface Hardening

\* Carburizing

\* Cyaniding

\* Nitriding

Which of the following case hardening processes, result in a change in the composition in a steel component?

- |   |                     |
|---|---------------------|
| 1. Carburizing  | 2. Cyaniding        |
| 3. Nitriding  | 4. Flame hardening  |
| (a) 2, 3 and 4 only                                     | (b) 1, 3 and 4 only |
| <input checked="" type="checkbox"/> (c) 1, 2 and 3 only | (d) 1, 2, 3 and 4   |



Cooling Media



(Quenching Media)



Cooling order

\* Brine Solution > H<sub>2</sub>O > oil > Air

Consider the following:

1. Water
- ~~2. Ice~~
3. Brine solution
4. Oil

Which of these is/are used as quenching media in case of Alloy steels?

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



pearlite  $\rightarrow (\alpha + Fe_3C)$

\* Water  $\rightarrow$  Martensite (BCT)

\* Oil  $\rightarrow$  Very fine pearlite

\* Air  $\rightarrow$  Fine pearlite

\* Furnace cooling  $\rightarrow$  Coarse pearlite  
(Annealing)

Match List-I (Quenching media) with List-II (Structure produced) and select the correct answer using the code given below the lists:

**List-I**

- A. Water
- C. Air

- B. Oil
- D. Furnace cool

**List-II**

- 1. Coarse pearlite
- 3. Very fine pearlite
- 2. Martensite
- 4. Fine pearlite

Code:

	A	B	C	D
(a)	1	3	4	2
(b) ✓	2	3	4	1
(c)	1	4	3	2
(d)	2	4	3	1



MCQ

Isothermal annealing is mainly used in alloy steels to improve.

- (a) Machinability
- (b) Toughness
- (c) Ductility
- (d) Weldability

Annealing



(Furnace cooling)

- \* Ductility ↑
- \* Machinability ↑
- \* Toughness ↑
- \* Coarse Pearlite

- \* Hardness ↓
- \* Strength ↓



- \* Isothermal Annealing
- ⇓
- Machinability ↑

\* Tempering  
↓

Martensite at lower  
critical temperature

- Tempering is a process of annealing
- (a) martensite at low temperatures
  - (b) martensite at higher temperatures
  - (c) bainite at low temperatures
  - (d) bainite at higher temperatures

\* Austempering → Bainite structure formed



Which one of the following is the process to refine the grains of metal after it has been distorted by hammering or cold working?

- (a) Annealing
- (b) Softening
- (c) Recrystallizing
- (d) Normalizing

Match List-I (Effect of Cooling) with List-II (Cooling Medium) and select the correct answer using the codes given below the lists:

**List-I**

**List-II**

- |                       |   |                   |
|-----------------------|---|-------------------|
| A. Martensite         | ← | 1. Water quenched |
| B. Very fine pearlite |   | 2. Air cooled     |
| C. Fine pearlite      | ← | 3. Furnace cooled |
| D. Coarse pearlite    | ← | 4. Oil quenched   |

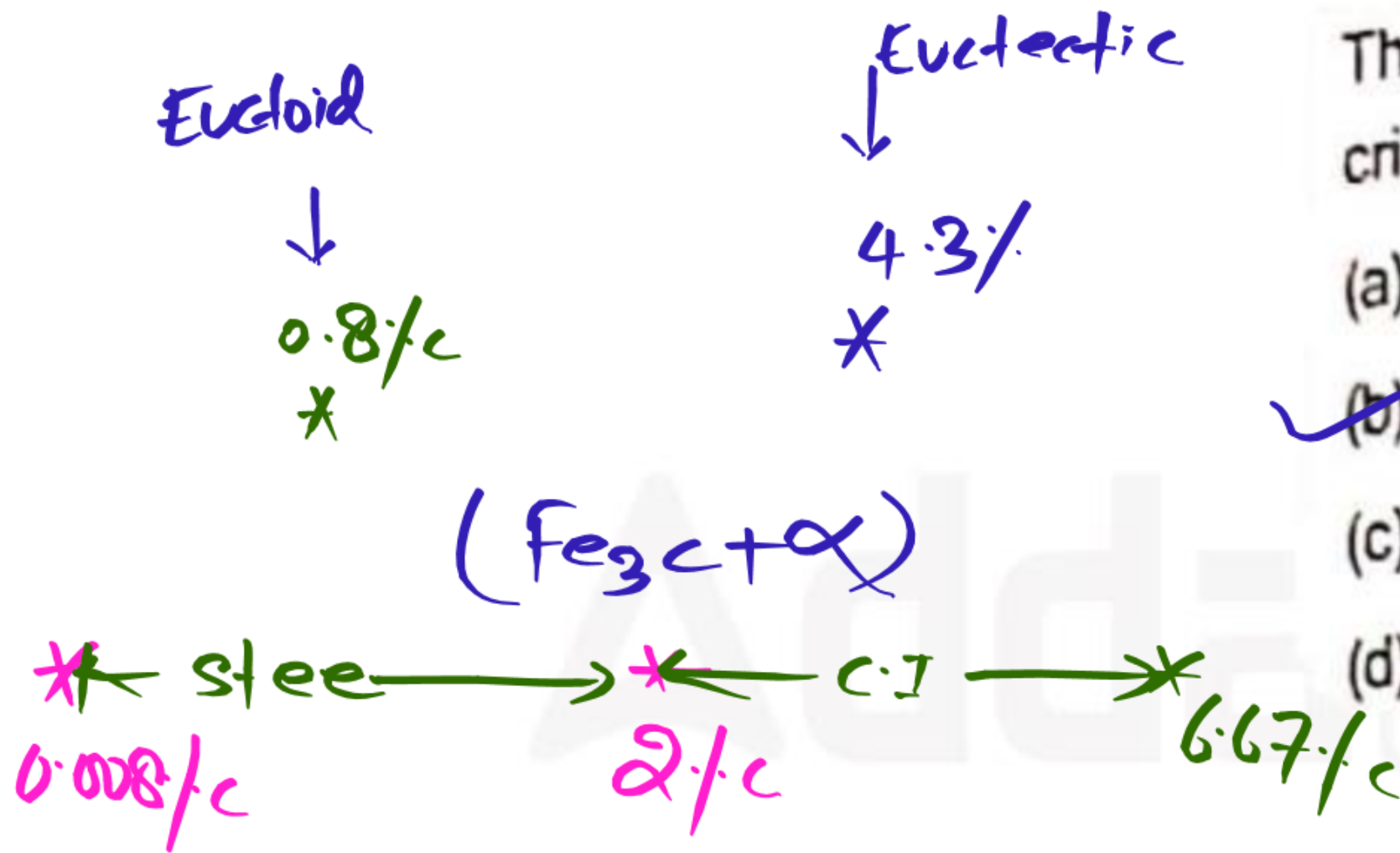
**Codes:**

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
(a)	1	4	2	3
(b)	2	3	1	4
(c)	2	3	4	1
(d)	1	2	3	4



The eutectoid of carbon in iron, above lower critical temperature, when cooled, results in

- (a) Ferrite and austenite
- (b) Ferrite and cementite
- (c) Cementite and austenite
- (d) Ferrite, cementite and austenite



Austempering is employed to obtain

- (a) 100% martensitic structure
- (b) 100% bainitic structure
- (c) 50% martensitic and 50% bainitic structure
- (d) 100% pearlitic structure



T.T.T. diagram indicates time and temperature transformation of

\* Pearlite  $\rightarrow (\alpha + Fe_3C)$

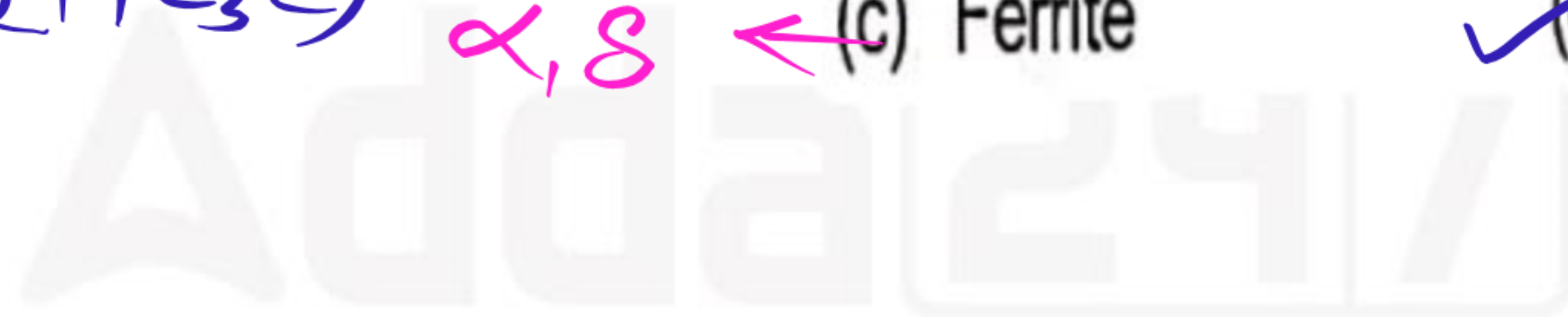
\* Ledeburite  $\rightarrow (\delta + Fe_3C)$

$Fe_3C$   $\leftarrow$  (a) Cementite

(b) Pearlite  $\rightarrow (\alpha + Fe_3C)$

$\alpha, \delta$   $\leftarrow$  (c) Ferrite

$\checkmark$  (d) Austenite  $\rightarrow \delta$



Full Annealing



Ductility ↑

Spheroidizing ⇒ Machinability ↑

Consider the following pairs:

Heat treatment

Effects on medium carbon steel

- |                   |   |                         |
|-------------------|---|-------------------------|
| 1. Normalising    | → | Grain refinement        |
| 2. Full annealing | → | Uniform grain structure |
| 3. Martempering   | → | Decreased ductility     |
| 4. Spheroidizing  | → | Maximum softness        |

Which of the pairs given above are correctly matched?

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

(b) 2 and 3

✓ (d) 1, 2, 3 and 4



Machine Tool Guideways

OR

Machine Tool Bed → C.I



Flame Hardening (Neutral Flame)

Machine tool guideways are usually hardened by

- (a) ~~vacuum hardening~~
- (b) ~~martempering~~
- (c) induction hardening
- (d)  flame hardening

Match **List-I** (Heat treatment) with **List-II** (Effect on the properties) and select the correct answer using the codes given below

**List-I**

- A. Annealing
- B. Nitriding
- C. Martempering
- D. Normalising

**List-II**

- 1. Refined grain structure
- 2. Improves the hardness of the whole mass
- 3. Increases surface hardness
- 4. Improves ductility

**Codes:**

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
(a)	4	3	2	1
(b)	1	3	4	2
(c)	4	2	1	3
(d)	2	1	3	4



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