ISRO | BHEL | DRDO & OTHER PSUs

PRODUCTION

WELDING

MOST EXPECTED QUESTIONS

Live@ 11:30Am

PART-2

GATE

Gaurav sir

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YouTube Classes Schedule

ENGINEERS

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

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

Given Data :→

* OCV = 80V
* SCC = 300A

For Max Power

⇓

* V = 40V
* I = 150A

The voltage-current characteristics of a dc generator for arc welding is a straight line between an open-circuit voltage of 80 V and short-circuit current of 300 A. The generator setting for maximum arc power will be

(a) 80V & 150A (b) 40V & 300A

(c) 40V & 150A (d) 80V & 300A

For Max Power

⇓

$* I = \frac{SCC}{2}$

$* V = \frac{OCV}{2}$

Consider the following processes:

1. Gas welding
2. Thermit welding
3. Arc welding
4. Resistance welding

The correct sequence of these processes in increasing order of their welding temperature is

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

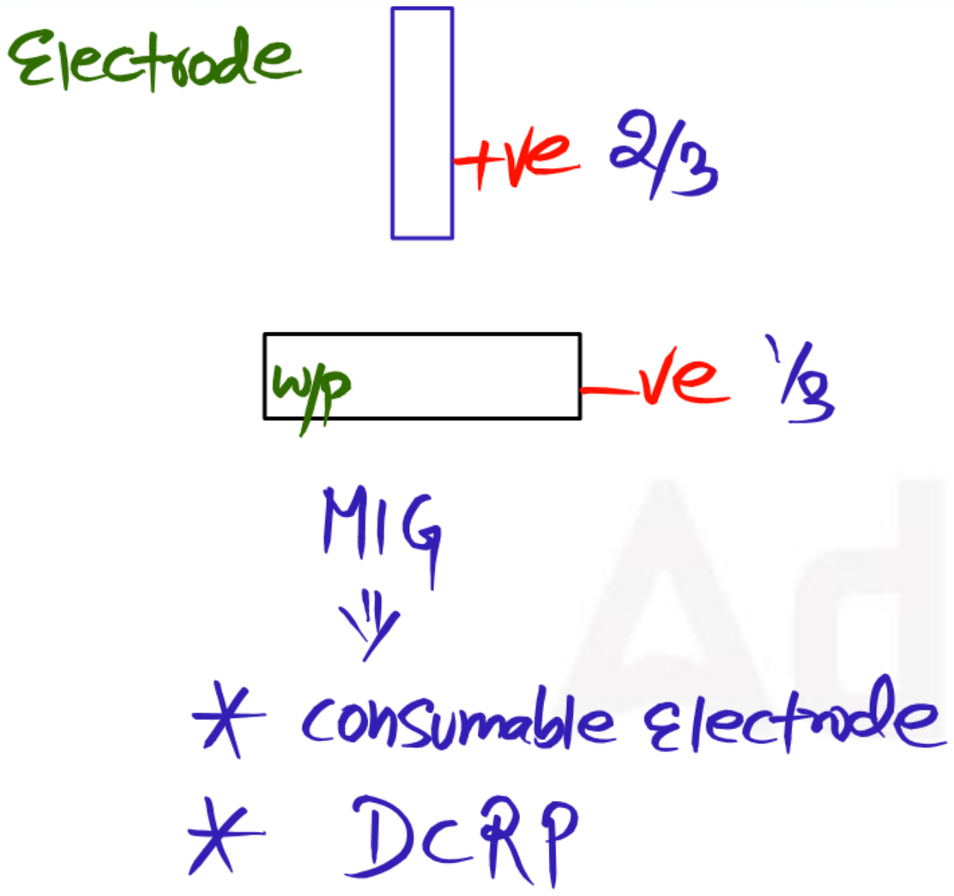
* Gas welding → 2300°c – 3300°c

* Thermit welding → 2500°c – 3000°c

* Arc welding → 3500°c – 15000°c

* Resistance welding → 750° – 1800°c

④ < ② < ① < ③



Consider the following statements:

MIG welding process uses

1. consumable electrode
2. non-consumable electrode
3. D.C. power supply → DCRP
4. A.C. power supply

Which of these statements are correct?

(a) 2 and 4 (b) 2 and 3

(c) 1 and 4 (d) 1 and 3

In oxy-acetylene gas welding, for complete combustion, the volume of oxygen required per unit of acetylene is

(a) 1
(b) 1.5
(c) 2
(d) 2.5

Primary Reaction

$* C_2H_2 + O_2 \rightarrow 2CO + H_2 + \Delta H$

Secondary Reaction

$* 2CO + H_2 + \frac{3}{2}O_2 \rightarrow 2CO_2 + H_2O + \Delta H$

$* \boxed{C_2H_2 + \frac{5}{2}O_2 \rightarrow 2CO_2 + H_2O + Heat}$

For complete combustion

⇓

* 1 mole of C_2H_2 Required

⇓

2.5 mole of O_2.

* 1 mole of O_2 taken from Atmosphere $\Rightarrow$ Primary Reaction

* 1.5 mole of O_2 taken from O_2 cylinder $\Rightarrow$ Secondary Reaction

Weldability

$* Al < Cu < C.I < M.S$

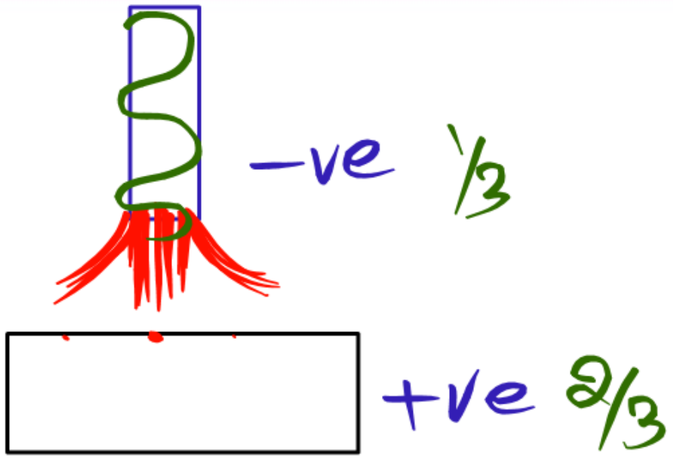
The correct sequence of the given materials in ascending order of their weldability is

(a) MS, copper cast iron, aluminium

(b) Cast iron, MS, aluminium copper

(c) Copper, cast iron, MS, aluminium

(d) Aluminium, copper, cast iron, MS



Arc Blow

⇓

Electromagnetic force

⇓

DCSP

Arc blow is more common in

(a) a.c. welding

(b) d.c. welding with straight polarity

(c) d.c. welding with bare electrodes

(d) a.c. welding with bare electrodes

✗ Ac Power Source

⇓

Arc Blow eliminated

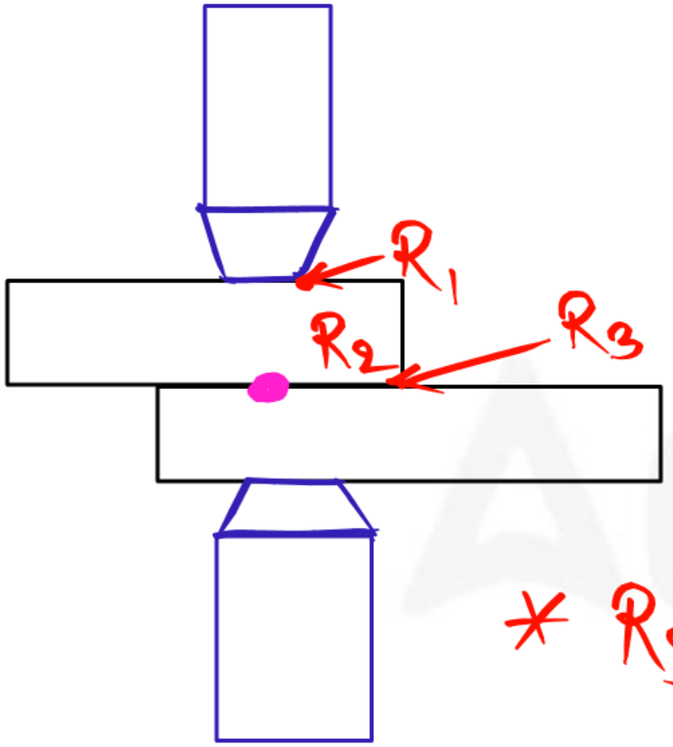
Pinch effect in welding is the result of

(a) expansion of gases in the arc

(b) electromagnetic forces

(c) electric force

(d) surface tension of the molten metal



The maximum heat in resistance welding is at the

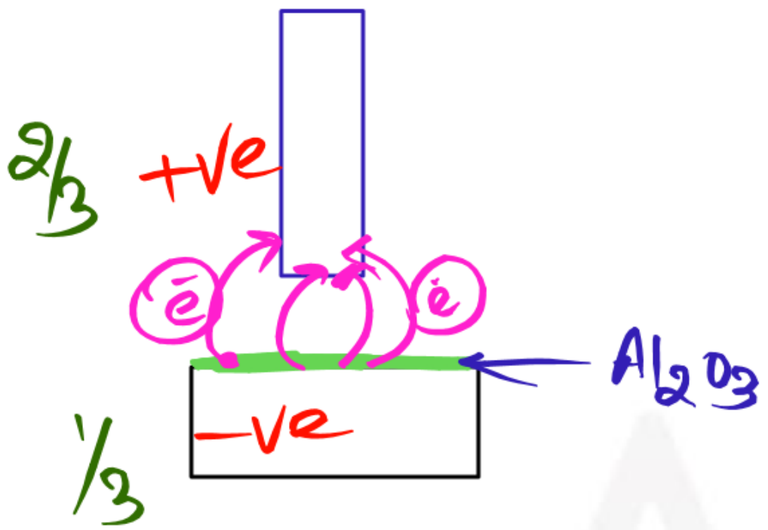
(a) tip of the positive electrode

(b) tip of the negative electrode

(c) top surface of the plate at the time of electric contact with the electrode

(d) Interface between the two plates being

* $R_3 >> R_1$ And R_2



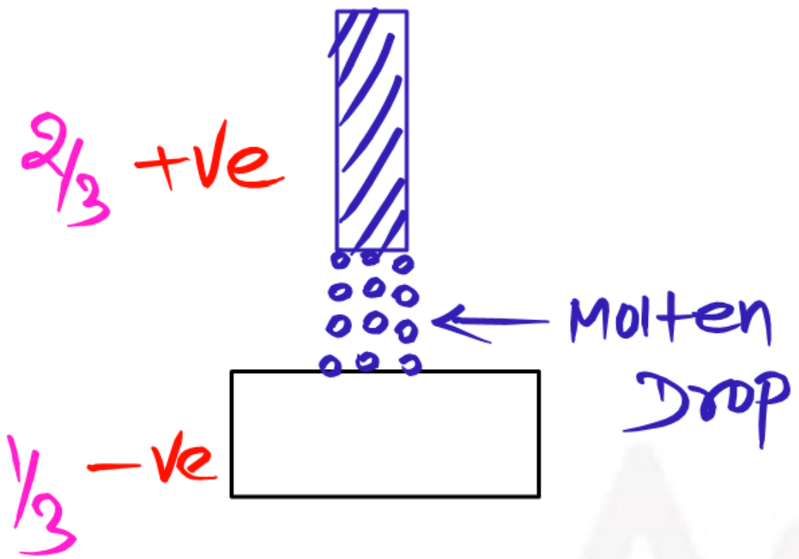
During plasma arc welding of aluminium, improved removal of the surface oxide from the base metal is obtained with typical polarity of

(a) DC straight

(b) DC reverse

(c) AC potential

(d) reverse polarity of phase of AC potential



In MIG welding, the metal is transfered into the form of which one of the following?

(a) A fine spray of metal

(b) Molten drops

(c) Weld pool

(d) Molecules

MIG

* consumable electrode
* DCRP

Weldability depend on :

1. Thermal conductivity (↑) ⇒ weldability ↓
2. Surface condition
3. Change in microstructure

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

Which of the following statements is correct?

(a) No flux is used in gas welding of mild steel

(b) Boarx is the commonly used flux coating on welding electrodes

(c) Laser beam welding employs a vacuum chamber and thus avoids use of a shielding method.

(d) AC can be used for GTAW process

Brazing

EBW

Al welding

DCSP

Reducing flame
⇓
carburizing flame
⇓
* $O_2 < C_2H_2$

Oxyacetylene reducing flame is used while carrying out the welding on

(a) mild steel → Neutral flame
(b) high carbon steel
(c) grey cast iron → ⇓ Neutral flame
(d) alloy steels → ⇓ Neutral flame

$$* \text{Duty cycle} = \frac{\text{Arc on Time}}{\text{Arc on Time} + \text{Idle Time}}$$

Consider the following statements:

1. In arc welding, 65% to 75% heat is generated at the anode.
2. Duty cycle in case of arc welding is the cycle of complete welding of work piece from the beginning.
3. Arc blow is more common with DC welding.

Which of these statements are correct?

(a) 1, 2 and 3
(b) 1 and 2
(c) 2 and 3
(d) 1 and 3

The advantage of the welding process is

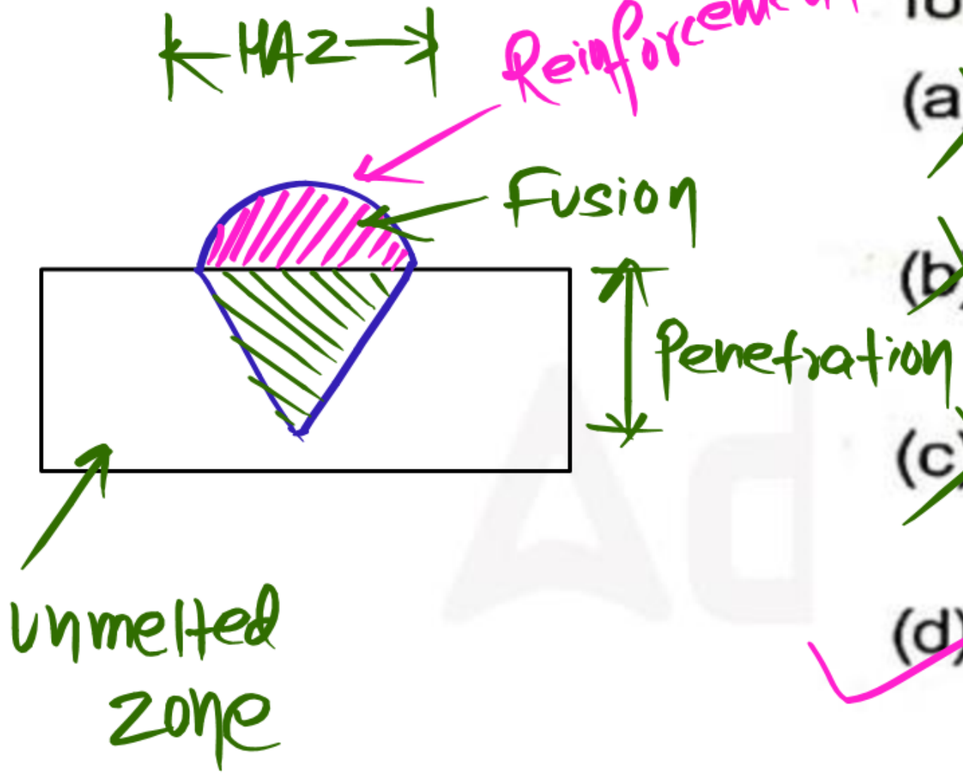
Heat Treatment ←

(a) It relieves the joint from residual stresses

(b) It helps in checking of distorion of work piece

(c) Large number of metals and alloys, both similar and/or dissimilar can be joined

(d) Heat produced during the welding does not produce metallurgical changes



In liquid-state welding process, the zones formed are

(a) gas-shielded zone, fusion zone and unaffected original base metal zone

(b) liquid zone, fusion zone and heat-affected unmelted zone

(c) liquid-shielded zone, gas-shielded zone and flux-metal reactive zone

(d) fusion zone, heat-affected unmelted zone and unaffected original base metal zone

Consider the following welding processes:

1. TIG welding → Thin Plate e/w/p
2. Submerged arc welding
3. Electro-slag welding
4. Thermit welding

→ Thick Plate e/w/p

Which of these welding processes are used for welding thick pieces of metals?

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

Brittle welds are mainly obtained due to

(a) Wrong electrode, faulty preheating and metal hardened by air

(b) Faulty welds, faulty sequence and rigid joints

(c) Wrong speed, current improperly adjusted and faulty preparation

(d) Uneven heat, improper sequence and deposited metal shrinks

Which of the following are associated with Heat Affected Zone?

1. Cold cracking
2. Notch toughness
3. Hydrogen embrittlement
4. Stress corrosion cracking

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

Match List-I (Welding Process) with List-II (Application) and select the correct answer using the code given below the lists:

List-I

A. Laser welding
B. Friction welding
C. Ultrasonic
D. Explosive welding

List-II

1. Uniting large-area sheets
2. Reparing large parts
3. Welding a rod to a flat surface
4. Fabrication of nuclear reactor components
5. Welding very thin materials

Codes:

	A	B	C	D
(a)	5	4	3	2
(b)	1	4	2	5
(c)	1	3	4	2
(d)	5	3	4	1

Fabrication weldability test is used to determine

(a) mechanical properties required for satisfactory performance of welded joint

(b) susceptibility of welded joint for cracking

(c) suitability for joint design

(d) appropriate machining process

$O_2 - C_2H_2$ welding

⇓

* O_2 cylinder → Black colour → 14 MPa
* C_2H_2 cylinder → Red/Maroon colour → 1.4 MPa

⇓

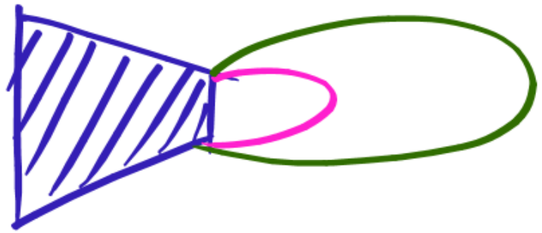
* Stoore with the help of Acetone.
* Low pressure

Consider the following statements in respect of oxyacetylene welding:

1. The joint is not heated to state of fusion
2. No pressure is ued
3. Oxygen is stored in steel cylinder at a pressure of 14 MPa.
4. When there is an excess of acetylene used, there is a decided change in appearance of flame.

Which of these statements are correct?

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



Hot cracks occur in the weld and fusion zone as the metal solidifies. Which of the following are the causes for hot cracks?

1. Presence of sulphur and phosphorus in the base metal
2. High carbon or alloy content of the base metal
3. Moisture in the joint or electrode
4. Joint restraint

Select the correct answer using the code given below:

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

Match List-I (Welding Defects) with List-II (Causes) and select the correct answer using the codes given below the lists:

List-I

A. Spatter
B. Distortion
C. Slag inclusion
D. Porosity

List-II

1. Damp electrodes
2. Arc blow
3. Improper cleaning in multipass welding
4. Poor joint selection

Codes:

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

In resistance welding, heat is generated due to the resistance between

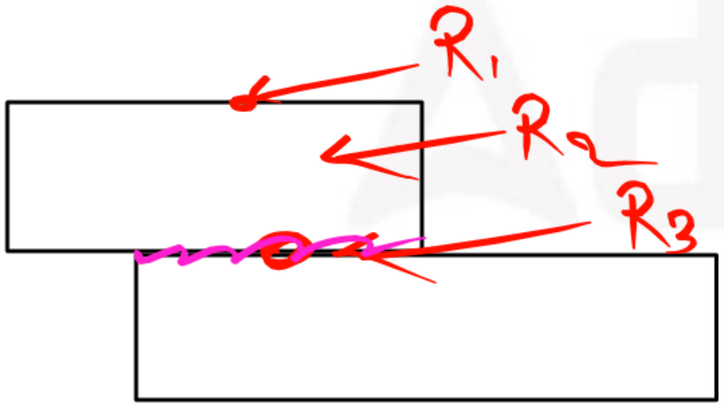
(a) Electrod and workpiece

(b) Asperities between touching plates

(c) Two dissimilar metals being in contact

(d) Interface forces

$H = i^2 R_3 T$



$* \; R_3 >> R_1 \& R_2$