Assignment 5

The due date for submitting this assignment has passed. Due on 2018-03-11, 23:59 IST.

Submitted assignment

1) The variant of plasma arc welding (PAW) with current less than 15 A is known as

- Melt-in mode
- Keyhole mode
- Non-transferred arc mode
- Micro-plasma mode

No, the answer is incorrect.
Score: 0
Accepted Answers:
Micro-plasma mode

2) In bio-medical components, the guide wire for catheter application used to join with Nitinol is mainly

- SS 301L
- SS 316H
- SS 316L
- SS 310

No, the answer is incorrect.
Score: 0
Accepted Answers:
SS 316L

3) In a resistance micro-welding process, the applied voltage is 2.5 V and overall contact resistance between butt joined sheets is $2 \times 10^{-4} \text{ ohm-cm}^2$. The amount of heat generated per unit area (in W/cm$^2$) is

- $10^3$
- $10^4$
- $2 \times 10^3$
- $2.25 \times 10^4$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$2.25 \times 10^4$

https://onlinecourses.nptel.ac.in/noc18_me20/unit?unit=32&assessment=36
4) In a laser welding process, the average laser power is 200 W and it is focused on a circular area of diameter 200 µm. The power density (in W/m²) of focused laser is

- \((2/\pi)\times10^{10}\)
- \((1/\pi)\times10^8\)
- \((2/\pi)\times10^8\)
- \((1/\pi)\times10^{10}\)

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**
- \((2/\pi)\times10^{10}\)

5) Based on the shear strength of the joint, the ascending order of bondability in the process of bonding with nano-particles is

- Ni > Al > Ag
- Ni > Ag > Al
- Al > Ag > Ni
- Ag > Cu > Ti

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**
- Ag > Cu > Ti

6) In microelectronics wire bonding, which one of the following joining principles is generally followed?

- Adhesive bonding
- Laser transmission welding
- Ultrasonic welding
- Brazing

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**
- Ultrasonic welding

7) In a solid state nano-bonding process, with reduction in size of nano-particles

- the diffusion process will be retarded.
- the sintering and bonding temperature will decrease.
- the specific surface energy will decrease.
- the activation energy of the process will increase.

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**
- the sintering and bonding temperature will decrease.

8) Consider the five phases of laser droplet welding: B - droplet creation, A - droplet detachment, D - droplet flight, C - droplet landing, E - droplet solidification.

- A – B – E – C – D
- A – B – C – D – E
- A – B – E – D – C
- B – A – D – C – E

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**
- B – A – D – C – E
9) Which of the following statement is correct related to electron beam micro-welding process?

- Scanning electron microscope (SEM) cannot be converted to electron beam (EB) microwelding by modifying optics
- Apertures reduce the excess electron in SEM
- Condenser lens reduces the effective beam power in SEM
- Microwelding mode by EB is produced by removal of the apertures and one condenser lens

**No, the answer is incorrect.**

**Score:** 0

**Accepted Answers:**

*Microwelding mode by EB is produced by removal of the apertures and one condenser lens*

10) In a diffusion bonding process between carbon into iron, the process is carried out at 1000°C. The activation energy for diffusion is 157 kJ/mol, diffusion constant $D_0$ for carbon in iron $0.7 \times 10^{-4} \text{ m}^2/\text{s}$, and universal gas constant is 8.314 J/mol-K. The value of diffusion coefficient (in m$^2$/s) at 1000°C is

- $2.53 \times 10^{-11}$
- $4.42 \times 10^{-13}$
- $4.42 \times 10^{-12}$
- $2.53 \times 10^{-12}$

**No, the answer is incorrect.**

**Score:** 0

**Accepted Answers:**

$2.53 \times 10^{-11}$