

X

reviewer1@nptel.iitm.ac.in ▼

Courses » Advances in Welding and Joining Technologies

Announcements Course Ask a Question Progress Mentor

Unit 3 - Week 2: Laser and Electron Beam Welding

Course outline

How to access the portal

Week 1:
Fundamentals of Welding and Joining

Week 2: Laser and Electron Beam Welding

- Lesson 1: Laser and Electron Beam Welding Part I
- Lesson 2: Laser and Electron Beam Welding Part II
- Quiz : Assignment 2
- Assignment 2 (Solution)
- Lecture Content (WEEK 2)

Week 3: Solid State Welding Processes

Week 4: Computational Welding Mechanics

Week 5: Micro and Nano Joining Processes

Week 6: Welding Metallurgy

Week 7: Welding and Joining of

Assignment 2

The due date for submitting this assignment has passed. **Due on 2018-02-19, 23:59 IST.**

Submitted assignment

1) Which one of the following is a false statement about Laser beam welding (LBW) process? **1 point**

- Not limited to electrically conductive materials
- Requires a vacuum
- Does not produce X-rays
- Energy transfer mechanism is different from arc welding

No, the answer is incorrect.

Score: 0

Accepted Answers:

Requires a vacuum

2) In a Laser welding process, if the diameter of fibre is 2 cm with focal length of collimator and focussing optics are 10 mm and 25 cm respectively, then what is the corresponding final spot size in mm? **1 point**

- 50
- 0.8
- 7.75
- 8

No, the answer is incorrect.

Score: 0

Accepted Answers:

0.8

3) Which of the following is an incorrect statement about the beam quality (M^2) of laser? **1 point**

- It depicts the deviation from the theoretical Gaussian
- Its value is not equal to 1 for TEM_{00} Mode
- Between 1.1 and 1.7 for diode laser
- Measure of energy distribution

No, the answer is incorrect.

Score: 0

Accepted Answers:

Its value is not equal to 1 for TEM_{00} Mode

Non-Metals

Week 8: Metal Transfer in Welding and Metal Printing

4) If the pulse frequency of an Nd:YAG laser is 10 kHz and average power is 1 Watt. Then the peak power for a pulse duration of 5µs is **1 point**

- 20 W
- 200 W
- 10 W
- 100 W

No, the answer is incorrect.

Score: 0

Accepted Answers:

20 W

5) Which one of the following statements is incorrect about Keyhole mode welding? **1 point**

- High welding depth
- Applicable for thick plate
- High coupling efficiency
- Very smooth, highly aesthetic weld bead

No, the answer is incorrect.

Score: 0

Accepted Answers:

Very smooth, highly aesthetic weld bead

6) Which one of the following is the most influencing driving force, that assists molten material flow? **1 point**

- Electromagnetic force
- Surface tension force
- Mechanical force
- Gravity force

No, the answer is incorrect.

Score: 0

Accepted Answers:

Surface tension force

7) Which of the following is incorrect about the bead shape in case of laser-assisted Hybrid welding? **1 point**

- Smaller the distance between the arc and laser beam results deeper penetration
- Assisted gas blowing into the weld pool disrupts bead surface
- Increasing arc power decreases the bead width
- If laser beam precedes arc since the assist gas flow does not affect the molten pool

No, the answer is incorrect.

Score: 0

Accepted Answers:

Increasing arc power decreases the bead width

8) What is the significance of vacuumed environment in the Electron Beam Welding (EBW)? **1 point**

- For concentrated focussing of beam on substrate
- For generation of magnetic field
- No electro-magnetic effect on electron beam
- It eliminates atmospheric contaminates in the weld

No, the answer is incorrect.

Score: 0

Accepted Answers:

It eliminates atmospheric contaminates in the weld

9) Which of the following force is required to create the keyhole in Electron Beam Welding (EBW)? **1 point**

- Upsetting pressure
- Vapour pressure
- Drag force
- Gravity force

No, the answer is incorrect.

Score: 0

Accepted Answers:

Vapour pressure

10) During Electron Beam Welding (EBW) of dissimilar material, beam deflection occurs mainly due to **1 point**

- Residual strain
- Thermo-electric magnetic fields generated by temperature gradient
- Thomson effect
- High stiffness

No, the answer is incorrect.

Score: 0

Accepted Answers:

Thermo-electric magnetic fields generated by temperature gradient

11) Beam parameter product (BPP) of a laser beam is defined as: **2 points**

- The product of beam radius and the beam divergence half-angle
- The difference between beam diameter and the beam divergence half-angle
- The ratio of beam diameter and the beam divergence half-angle
- The summation between beam diameter and the beam divergence angle

No, the answer is incorrect.

Score: 0

Accepted Answers:

The product of beam radius and the beam divergence half-angle

12) Hybrid laser brazing uses between the part and the tip of the wire feeding system to increase the temperature of the wire. **2 points**

- Conduction heating
- Resistance heating
- Induction heating
- Joule's heating

No, the answer is incorrect.

Score: 0

Accepted Answers:

Resistance heating

13) In Laser welding, upslope pulse shaping at beginning and downslope at end is used for crack sensitive material because: **2 points**

- Upslope prevent spattering and downslope controls heating cycle
- Upslope enhance penetration and downslope maintain narrow width
- Upslope degrades thermal properties and downslope controls cooling
- Upslope prevents thermal sock and downslope controls cooling

No, the answer is incorrect.

Score: 0

Accepted Answers:

Upslope prevents thermal sock and downslope controls cooling

33

14 For Electron Beam welding (EBW) process, depth of penetration of bead geometry increases due to increase in

2 points

1. Accelerating voltage
 2. Travel speed
 3. Beam current
-
- Only accelerating voltage
- Both accelerating voltage & travel speed
- Both accelerating voltage & beam current
- Accelerating voltage, beam current & travel speed

No, the answer is incorrect.

Score: 0

Accepted Answers:

Both accelerating voltage & beam current

15 For laser beam optics if the divergence angle (θ) is equal to 45° and wave front curvature at maximum point is π nm, then the diameter of focal spot in nm is

2 points

- 0.25
- 0.5
- 4
- 5

No, the answer is incorrect.

Score: 0

Accepted Answers:

5

Previous Page

End

© 2014 NPTEL - Privacy & Terms - Honor Code - FAQs -



A project of



In association with



Funded by

Government of India
Ministry of Human Resource Development

Powered by

