Unit 7 - Week 6:
Stress and strain measurement

Assignment 6

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment.

Due on 2019-03-13, 23:59 IST.

1) Among the following choices for the grid material, which one can lead to a negative gage factor? 1 point

- nichrome
- manganin
- monel
- nickel

No, the answer is incorrect.
Score: 0
Accepted Answers:
nickel

2) Among the following choices for the grid material, which one is not suitable for high-temperature applications? 1 point

- nichrome
- isoelastic
- monel
- platinum-iridium

No, the answer is incorrect.
Score: 0
Accepted Answers:
isoelastic

3) Poisson’s ratio is defined as the ratio of lateral to longitudinal strains 1 point

- ratio of lateral to longitudinal strains

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

Among the following choices for the grid material, which one is not suitable for high-temperature applications?
4) For a perfectly incompressible material, the magnitude of Poisson’s ratio is

- 0.5
- 0.8
- 1.0
- 2.0

No, the answer is incorrect.
Score: 0
Accepted Answers: 0.5

5) Lead-wire error refers to the error appearing because of the

- insufficient meter resistance on the output side
- change in bridge resistance with temperature
- self-compensation characteristics
- long wires connecting gage & other instrument

No, the answer is incorrect.
Score: 0
Accepted Answers: long wires connecting gage & other instrument

6) The outer surface of a cylindrical pressure vessel is subjected to 400 μm per m of hoop strain, but negligible longitudinal strain. Corresponding Poisson’s ratio is 0.3 and modulus of elasticity is 203 GPa. Then the corresponding longitudinal stress (correct to 2 decimal places) is ______________ MPa.

No, the answer is incorrect.
Score: 0
Accepted Answers: (Type: Range) 26.0, 27.5

7) A strain-gage ballast circuit is comprised of a ballast resistor of 100 Ω and excitation voltage of 5 V. If it is designed to ensure the maximum sensitivity with a gage factor of 2, then the change in the output voltage corresponding to an imposed strain of 12.5 μm per m (correct to 2 decimal places) is ______________ μV.

No, the answer is incorrect.
Score: 0
Accepted Answers: (Type: Range) 31.1, 31.4
8) Strain in a Cantilever beam section is measured using a resistance strain gage (gage factor = 2), which forms one arm of bridge circuit, in a quarter-bridge configuration. If the initial resistance of each arms of the bridge is equal, then the ratio of the bridge output to input voltage for an imposed strain of 12.5 μm per m (correct to 2 decimal places) is

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\text{___________}.
\]

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 6.1, 6.4

1 point

9) Two identical resistance strain gages (gage factor = 2) have been mounted on a beam such that the gage 1 is on the tensile side of the beam and gage 2 is on the compressive side. The beam is made of steel (modulus of elasticity = 203 GPa). If the combined readout from both the gages is 390 μm per m, the stress acting at the longitudinal centre of the beam (correct to 2 decimal places) is ______________ MPa.

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\text{___________}.
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No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 39.0, 40.0

1 point

10) Three identical strain gages are used to form a rectangular rosette. For a particular situation, all three gages indicate 100 μm per m of strain. Corresponding Poisson's ratio is 0.3 and modulus of elasticity is 207 GPa. Then the magnitude of principal stress (correct to 2 decimal places) is ______________ MPa.

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\text{___________}.
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No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 29.0, 30.0

1 point

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