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Unit 3 - Week 1: Overview of compliant mechanisms; mobility analysis.

Assignment Week 1

The due date for submitting this assignment has passed. Due on 2018-02-05, 23:59 IST.
As per our records you have not submitted this assignment.

1) In a 6×6 compliance matrix, how many entries would be zero for an ideal spherical ball joint? ***1 point***

- 33
- 32
- 31
- 30

No, the answer is incorrect.
Score: 0

Accepted Answers:
33

2) Can a helical spring be called a compliant mechanism? If so, what is it best used for? ***1 point***

- No
- Yes; to transmit motion
- Yes; to transform energy
- Yes; to transmit motion and to transform energy

No, the answer is incorrect.
Score: 0

Accepted Answers:
Yes; to transmit motion and to transform energy

3) Mark the following statements as A if true and B if false. If flexibility is a matter of design, then one can build a compliant mechanism with granite. ***1 point***

- A
- B

No, the answer is incorrect.
Score: 0

Accepted Answers:
A

4) In which one of the following does a rigid-body mechanism fare better than a complaint mechanism, in general? ***1 point***

- Simplified assembly
- Mechanical advantage
- Minimizing backlash
- Economy of material

No, the answer is incorrect.
Score: 0

Accepted Answers:
Mechanical advantage

5) Assertion: Extended Grübler's formula predicts the upper limit of the degrees of freedom. Reasoning: Number of degrees of freedom of a compliant mechanism is always uncertain. ***1 point***

- Assertion is correct but not the reasoning.
- Assertion is incorrect, but the reasoning is correct.
- Assertion and reasoning are both correct.
- Neither the assertion nor the reasoning is correct.

No, the answer is incorrect.
Score: 0

Accepted Answers:
Assertion is correct but not the reasoning.

6) What is the state of self-stress of the following truss? ***1 point***

- 0
- 1
- 2
- 3

No, the answer is incorrect.
Score: 0

Accepted Answers:
1

7) Which one of the following identifies the difference between Grübler's formula (A) and extended Grübler's formula (B)? ***1 point***

- A never gives negative DoF whereas B does.
- A correctly predicts DoF of symmetric/special linkages whereas B doesn't.
- A predicts the upper limit of DoF whereas B predicts the lower limit of DoF.
- None of the above.

No, the answer is incorrect.
Score: 0

Accepted Answers:
None of the above.

8) Match the following ***1 point***

I	Null space of the compliance matrix indicates		A	a) DoF
II	Null space of the equilibrium matrix indicates		B	b) Self-stress modes
III	Rank-deficiency of the compliance matrix indicates		C	c) Rigid-body modes

- I-A, II-C, II-B

- I-C, II-B, III-A
- I-C, II-A, III-B
- I-A, II-B, III-C

No, the answer is incorrect.
Score: 0

Accepted Answers:
I-C, II-B, III-A

9) What kind of applications usually prefer rigid-body mechanisms over compliant mechanisms? ***1 po***

- MEMS applications
- Applications requiring minimal backlash error
- Applications demanding high mechanical efficiency
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Applications demanding high mechanical efficiency

10) Why should one prefer distributed compliance over discrete compliance? ***1 point***

- Better material utilization
- No localized stress concentrations
- Both A and B
- Neither A nor B

No, the answer is incorrect.
Score: 0

Accepted Answers:
Both A and B

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