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Unit 8 - Week 6: Designing compliant mechanisms using continuum topology optimization; distributed compliance

Assignment Week 6

The due date for submitting this assignment has passed. Due on 2018-03-07, 23:59 IST.
As per our records you have not submitted this assignment.

1) Which of the following formulations does not need an output force or a load? ***1 point***

- MSE/SE formulation
- Efficiency formulation
- Mechanical advantage formulation
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
None of the above

2) The appearance of point-flexures can be mitigated in topology solutions to obtain distributed compliant mechanism by… ***1 point***

- constraining the distortion energy of elements.
- modifying the objective function to minimize the relative rotation of elements around a node.
- erosion-dilation method.
- all of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
all of the above

3) Assertion 1: Skeletal shape optimization can be used to obtain true distributed compliant mechanisms. ***1 point***

Assertion 2: Skeletal shape optimization assumes uniform cross sections for beam segments.

- Both assertions are correct.
- Assertion 1 is incorrect but not Assertion 2.
- Assertion 1 is correct but not Assertion 2.
- Both assertions are incorrect.

No, the answer is incorrect.
Score: 0

Accepted Answers:
Assertion 1 is incorrect but not Assertion 2.

4) *Answer questions 4-10 based on YinSyn topology optimization code available at http://www.mecheng.iisc.ernet.in/~suresh/YinSyn/*

Run the file 'yinsyn.m' without changing the given input files and find the ratio of the final value to the initial value of the objective function.

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 85,88

1 point

5) Run the 'yinsyn.m' file without changing the boundary conditions to solve the stiff-structure problem. The value of objective function changes from … *1 point*

- -3.74E-002 to -9.37E-002
- -3.74E-002 to -6.74E-002
- -3.45E-002 to -9.37E-002
- 104691.19 to 328.28

No, the answer is incorrect.
Score: 0

Accepted Answers:
104691.19 to 328.28

6) Assertion 1: Objective function of the optimization problem implemented in the YinSYn code is -MSE/SE. Assertion 2: YinSyn code does not use a volume constraint. *1 point*

- Both assertions are correct.
- Assertion 1 is incorrect but not Assertion 2.
- Assertion 1 is correct but not Assertion 2.
- Both assertions are incorrect.

No, the answer is incorrect.
Score: 0

Accepted Answers:
Assertion 1 is correct but not Assertion 2.

7) Match the following lines of code to their role after going through the input file 'gripper.yin'. *1 point*

1. Line no 6	a. No of holes in the domain
2. Line no 58	b. Tolerance
3. Line no 18	c. Problem type
4. Line no 67	d. Poisson's ratio

- 1-b, 2-d, 3-a, 4-c.
- 1-c, 2-b, 3-a, 4-d.
- 1-a, 2-d, 3-c, 4-b.
- 1-c, 2-d, 3-a, 4-b.

No, the answer is incorrect.
Score: 0

Accepted Answers:
1-c, 2-d, 3-a, 4-b.

8) Run the given code after changing the volume fraction to 0.3 from 0.1. Final value of the objective function changes from … *1 point*

- -3.74E-002 to -9.37E-002
- -3.74E-002 to -1.55E-001
- -3.45E-002 to -9.37E-001
- -9.74E-001 to -3.37E-002

No, the answer is incorrect.
Score: 0

Accepted Answers:
-3.74E-002 to -1.55E-001

9) To modify the domain to include a non-design domain, which line of 'gripper.yin' has to be changed? ***1 point***

- Line no 18
- Line no 24
- Line no 15
- Line no 21

No, the answer is incorrect.
Score: 0

Accepted Answers:
Line no 24

10) To include an additional input force in 'gripper.yin', …. ***1 point***

- Line no 39 must be changed from 1 to 2.
- A new line specifying force direction and magnitude must be added after Line no 45.
- Both A and B.
- None of the above.

No, the answer is incorrect.
Score: 0

Accepted Answers:
Both A and B.

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