Lecture 3.10 Quiz
Principles of Electronic Nanobiosensors
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Answer the five questions below by choosing the one, best answer.

1) The displacement of a cantilever-based sensor can be measured by:
   a) Bouncing a laser beam on the tip of the cantilever.
   b) Observing the change in the resistance of a piezoelectric layer.
   c) Measuring the capacitance between the cantilever and an electrode underneath.
   d) All of the above.

2) The moment of inertia of a suspended beam depends on the:
   a) Cross-sectional geometry of the beam
   b) Material density of the beam
   c) Young’s modulus of the beam
   d) Type of end-support of the beam

3) The typical frequency of oscillation of a nanoscale cantilever (tens of nm thick, and a few microns in length and width) is approximately
   a) ~Hz
   b) ~MHz
   c) ~GHz
   d) ~THz

4) Increase in the spring constant (with other parameters remaining the same)
   a) Increases the frequency of oscillation.
   b) Decreases the frequency of oscillation.
   c) Keeps the frequency of oscillation unchanged.
   d) Depends on the damping constant.

5) For a nanoscale biosensor, the frequency of oscillation will:
   a) Increase or decrease depending on the amount of biomolecules collected.
   b) Always increase regardless of the sensor details.
   c) Always decrease regardless of the sensor details.
   d) Depends on the length of the cantilever beam.

End of quiz. This quiz contains 5 questions.