Department of Mechanical Engineering, IIT Delhi
Minor II: MCL 731 Analytical Dynamics
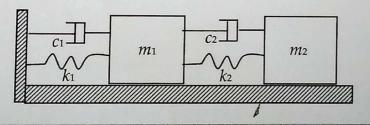
Instructor	S.K. Saha	Marks	20
Venue	LH318	Duration	09:30-10:30 (1 hour)
Date	10/5/2017 Thursday		

Instruction

- *Don't keep mobile with you. Keep in the front;*
- *Don't share calculator, Pencil, Compass, etc.*
- *Don't ask anything about the question paper (Do whatever you feel best!)*
  - *Show your I-card when signing the attendance sheet*

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1. For system shown in the figure find the following: [5+4+1=10]

   a. Write the Lagrange's equations of motion.
   b. Write Hamilton's equations of motion in 1st order form.
   c. Verify that the Hamilton's equations are basically same as Lagrange's equations.

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2. Answer the following questions: [5×2=10]

   a. What is the relationship between Lagrange's equations of motion and Hamilton's Principle?
   b. Relate D'Alembert's principle with Hamilton's generalized principle.
   c. Express Lagrange's equations of motion in the presence of constraints and non-conservative forces.
   d. Interpret Lagrange's multipliers with an example.
   e. Define ignorable coordinates with an example.

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