Quest training session for 303K-MI

by Manasvi Lingam

To Instructors and TAs of 303K/L, RLM 14.318 1-2 pm, Feb 22, 2011

Objectives of the workshop

- Log into quest.cns.utexas.edu

- Accessing the Quest Editor

- Steps involved in the preparation of a new problem

- Two sample problems to be undertaken

- Debugging

- Preparing an examination or an assignment

- **Practice Problem 1**

- Multiple choice question with an image to be inserted

- Input a simple formula

- **Practice Problem 2**

- Involving the randomization of variables

Accessing and using the Editor

- Log into Quest

- Click the "Editor" icon

- Use "Find question" and Area: "Chabay Sherwood MI" to search for previous exam problems and modify them accordingly.

- Select "New Question" on the left

- Enter the necessary details for the problem

- Question Name: Enter one of your choice

- Type: "Use an existing problem as template"

- Area: "New problems"

- Chapter: "Physics"

- Section: "Motion, Force, Energy" or the appropriate section

Practice Problem 1

Two identical springs in series (97875) v.3
Status: Published

Properties

Preview | Banks | Tags | History | Issues | Images

Preview

Unique versions: 1

Test image for Two identical springs in series (97875)   1

Two identical springs in series
001

Mg
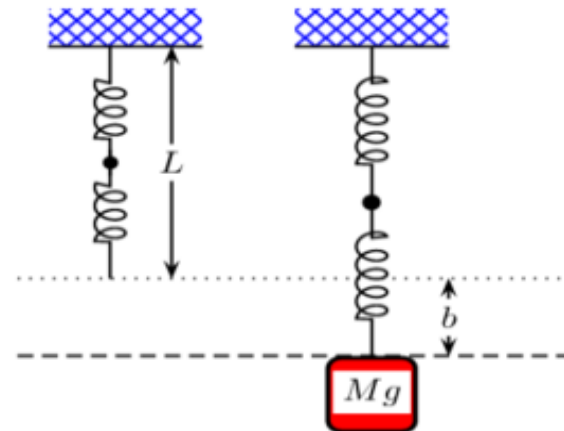
Two identical springs are lengthwise con-
nected, hanging from the ceiling. The mass
of the springs are negligible. Consider the
situation when there is a mass M attached
to the end the spring system and the system
is stretched by a length b. Choose correct
statements below

5. Ib, IIa, IIIa

6. Ib, IIa, IIIb **correct**

7. Ib, IIb, IIIa

8. Ib, IIb, IIIb

Explanation:
The stiffness of the 2-spring system for the
present setup is by definition $k = \dfrac{M g}{b}$. With
the series setup, by inspection the force along
each spring is $F = M g$. Since the total
stretch is given to be b, each of the spring
contributes a stretch of $\dfrac{b}{2}$. The stiffness of
one spring is $\dfrac{M g}{\frac{b}{2}} = \dfrac{2 M g}{b} = 2k.$

Practice Problem 1

- Using process outlined, prepare a new problem with problem ID #99819

- Segments: Body (question statement, choices and explanation) and Code

- Change statements A to F to Ia, Ib...

- Insertion of choices after question:

- *\choice{}{1}{Ia, IIa, IIIa }*

- $$\dstyle{2\,M\,g}{b}\,=\,2k$$

- Create 1, 2(?) and 4 choices

- Upload the image which has been given using the "Upload" icon (not required in this problem)

- Insert the image at the beginning using the dfig[4324, Y] command

- 4324 – picture number

- Y – measure of size (ex: 200)

Practice Problem 2

Apparent Weight in Aircraft
001

An airplane in a wide "outside" loop can create an apparent zero weight inside the aircraft cabin.

What must be the radius of curvature of the flight path for an aircraft moving at 480 km/h to create a condition of weightlessness inside the aircraft? Assume the acceleration of gravity is 9.8 m/s^2.

Correct answer: 1814.1 m.

Explanation:

Let : $v = 480 \text{ km/h} = 133.333 \text{ m/s}$ and
$g = 9.8 \text{ m/s}^2$.

To create a condition of weightlessness inside the aircraft, the airplane should be moving in such a way that the gravity acceleration g plays the role of a centripetal acceleration

$$a_c = \frac{v^2}{r}.$$

Equating g and a_c, we obtain

$$r = \frac{v^2}{g} = \frac{(133.333 \text{ m/s})^2}{9.8 \text{ m/s}^2}$$
$$= 1814.1 \text{ m}.$$

Practice Problem 2

- Using process outlined, prepare a new problem with problem ID #99817

- Notice the presence of @v in the explanation section and in the C code.

- @v allows one to insert the values into the problem with the appropriate units

- Use and understand the following codes in C

hws_random(300.0,768.0,3.0,480.0);

  Arguments: 300.0 - lower bound, 768.0 - upper bound, 3.0 - no. of significant figures, 480.0 - default value

randomStep(300.0,768.0,4.0,180.0);

  Arguments: 300.0 - lower bound, 768.0 - upper bound, 4.0 - step (gap between two values), 480.0 - default value

Debugging and other tools

- "TeX" allows one to lookup the appropriate line of TeX code
- "TeX output" allows one to pinpoint the lines at which the error has occured
- "Parameters" lists the max and min values of the parameters used
- "Preview" allows you to preview the problem after debugging is complete
- "Images" is where the images are uploaded and can be viewed

Generating an assignment

- Preparing assignment: After all questions have been "Updated and Generated" and "Published"

- Log into Quest and access the Instructor homepage

- Find the icon "New Assignment" at the bottom

- Create it and input appropriate parameters: name, type, etc

- Select "randomize question order"

- Add questions based on ID or search for the appropriate names and select "Done adding"

- Adjust points per question by clicking on Pencil icon

- After everything is done, preview by selecting the right icon just above the assignment

- Generated a .pdf file for viewing

References

- A good resource for the TEX symbols is found at:

  http://www.math.upenn.edu/tex-stuff/cookbook.pdf

- **C Functions and Directives** (including Tex, random numbers…

  http://web4.cns.utexas.edu/quest/support/editor/functions.htm

- My email address is:

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This concludes our presentation and we hope that the material covered will help you gain a head start in making midterm 2!