**IT231 – Final Exam  
November 22, 2011**

**Part A: Multiple Choice Questions.** Choose the correct answer for each question. Give an optional reason for each answer. 5 points each. Do all 13 questions.

1. If you created a Rails scaffold-based project named Hospital and model named Patient, which URL would you use to view the index view?  
   a. **http://localhost:3000/hospital**b. **http://localhost:3000/patient**

c. **http://localhost:3000/patient/index.html.erb**

d. **http://localhost:3000/patients**

1. Which of the following identifies name of a Ruby class?  
   a. **RandomImageController** b. **Random Image** **Controller**  
   c. **:random\_image\_controller** d. **@random\_image\_controller**
2. Which line of code deletes all the lines in the patients database table?  
   a. **Patient.delete\_all**  b. **Patients.delete\_all**b. **Patient.remove\_all** d. **Patients.remove\_all**
3. Which of these tags causes whitespace to be preserved?  
   a. **<literal>** b. **<pre>** c. **<preserve-whitespace>** d. **<verbatim>**
4. Which lines randomly display one of the images 1.jpg, 2.jpg, or 3.jpg  
   a. **<%= image\_tag (rand(2) + 1).to\_s + '.jpg' %>**  
   b. **<%= image\_tag (rand(3) + 1) + ".jpg" %>**  
   c. **<%= image\_tag (rand(3) + 1) + '.jpg' %>**d. **<%= image\_tag (rand(3) + 1).to\_s + '.jpg' %>**
5. Which of these FormTagHelper calls creates a textfield control:

a. **<%= f.text\_field\_tag, :first\_name, "" %>**

b. **<%= text\_field\_tag, :first\_name, %>**

c. **<%= text\_field\_tag, :first\_name, "" %>**

d. **<%= text\_field\_tag, @first\_name, "" %>**

1. Which of the following allows the controller to obtain the GradeRecord object passed to the controller from a form constructed with FormHelper methods?  
   a. **gr = GradeRecord.new(param[:gr])**  
   b. **gr = GradeRecord.new(param[:grade\_record])**  
   c. **gr = new GradeRecord(params[:gr])**  
   d. **gr = new GradeRecord(params[:grade\_record])**
2. Which line creates a radio button control using a FormHelper method call?  
   a. **<%= f.radio\_button gender, "Female", :checked => true %>**  
   b. **<%= f.radio\_button :gender, "Female", :checked => true %>**  
   c. **<%= f.radio\_button :gender, "Female", true %>**  
   d. **<%= radio\_button :gender, "Female", :checked -> true %>**
3. Which of the following defines a Ruby Range object?  
   a. **[1, 8]** b. **(1, 8)**  c. **{1, 8}**  d. **1..8**
4. Which is an important use for a cryptographic hash?  
   a. Checking the id number of a row in a database table.  
   b. Encrypting passwords in a password file.  
   c. Encoding binary data (such as image or sound) to transmitted over a network.  
   d. Validating data in controls in a Rails form.
5. How many rows of stars does the following Ruby code print to the command prompt window?  
   **(1..3).to\_a.each do |x|**

**(1..4).to\_a.each do |y|  
 print "\*"**

**end**

**print "\n"  
end**

a. 3 b. 4 c. 7 d. 12

1. A model that contains method definitions in addition to those specified by the fields of the database is what kind of model?  
   a. augmented b. enhanced c. fat d. supplementary
2. A Rails state variable can be stored in  
   a. a cookie. b. an instance variable. c. a local variable. d. between two HTML tags.

**Part B: Short Answer Questions.** Write out your answer for each question, showing your work. 5 points each.

1. Convert this decimal color specification to a hex color code:   
   **h1 { color: rgb(45,80,202); }**
2. Convert this base-64 value to a string: **U2t5** (uppercase U, lowercase t)

**Part C. Predict the Output.** For each Ruby or Embedded Ruby code fragment, predict the output. Show your work or give a reason explaining each answer. 5 points each.

1. What is displayed in the Command Prompt Window?

**a = "fig"**  
**b = "date"  
c = "$#{b+a}\n"**  
**d = '%#{a+b}\n'**   
**print c, d**

1. What possible random outputs could be displayed in the view?  
   **<% @a = ["coyote", "fox", "mink", "weasel", "wolf"] %>  
   <% @n = 1 + rand(2) %>  
   <p>Animal = <%= @a[@n] %></p>**
2. The database table GradeRecords contains this data:

|  |  |  |  |
| --- | --- | --- | --- |
| name | course\_number | credit\_hours | grade |
| Sue Morgan | ART103 | 4 | A |
| Martin Ramos | CHEM205 | 5 | B |
| Joe Chen | ENG101 | 3 | A |

What is the output of this source code?  
**s = 0  
GradeRecord.each do |r|**

**s = s + r.credit\_hours  
 end  
 print s, "\n"  
  
Part D. Modify a scaffold-based Project.** Two scaffold-based controllers are added to the Rails project Hospital. Here are the specs for the scaffold models:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  | | --- | --- | | DiamondBroker | | | Field | Data Type | | name | string | | phone | string | | address | text | | license\_no | string | | |  |  | | --- | --- | | CutDiamond | | | Field | Data Type | | carats | float | | color | string | | clarity | string | |

1. Write Rails Command Line statements to create the two scaffold-based controllers DiamondBrokers and CutDiamonds. 5 points.  
  
  
  
2. Write a statement to create a migration that adds the diamond\_broker\_id field to the CutDiamond model. (This would normally have been done in step 1). 3 points.

3. Modify the source code of the ChicagoDiamonds projects according to the following specifications. Write your code modifications directly on the source code on Pages 5 through 16. If you don’t understand how to write the requested source code, at least explain what you do understand about the problem. 3 points each.

1. Set up a one-to-many relationship for the DiamondBrokers and CutDiamonds models.
2. Set up a validation that insures that carats is numeric for the CutDiamonds model.
3. Place h1 headings of your choice at the top of the show view for DiamondBrokers and CutDiamonds.
4. Change the h1 headings on the index views for DiamondBrokers and CutDiamonds to make them more descriptive.
5. Change the index and show views for cut\_diamonds the name of the diamond broker is shown instead of diamond\_broker\_id.
6. Add a text field control on the cut\_diamonds form for entering diamond\_broker\_id.
7. Replace the :clarity text\_field control on the cut\_diamonds form with a select control (dropdown menu) that shows the options Flawless, SlightlyIncluded, Included with corresponding values F, SI, and I.
8. Add a column to the index view for DiamondBrokers that shows the count of cut diamonds that are for sale from each diamond broker.
9. Add the background image sparkling\_diamonds.jpg to all pages of the database.
10. Change the text color of all the hyperlinks to maroon using a hex color code.
11. Change the font size of all h1 headers to bold, italic, and teal using a hex color code.
12. On the DiamondBrokers index view, show the following sentence between the h1 heading and the table: “We have access to 23 diamond brokers that have a total of 579 diamonds for sale.” Replace 23 by the count of the rows in the DiamondBrokers table; replace 579 with the total of all the rows in the CutDiamonds table.

**Source code index for Doctors and Patients controllers:  
app/models/diamond\_brokers.rb Page 5  
app/models/cut\_diamonds.rb Page 5  
app/controllers/diamond\_brokers\_controller.rb Pages 6, 7  
app/views/diamond\_brokers/\_form.html.erb Page 8  
app/views/diamond\_brokers/index.html.erb Page 9  
app/views/diamond\_brokers/show.html.erb Page 10  
app/views/diamond\_brokers/new.html.erb Page 10  
app/controllers/cut\_diamonds\_controller.rb Page 11  
app/views/cut\_diamonds/\_form.html.erb Page 13  
app/views/cut\_diamonds/index.html.erb Page 14  
app/views/cut\_diamonds/show.html.erb Page 15  
app/views/cut\_diamonds/new.html.erb Page 15  
app/views/layouts/application.html.erb Page 15  
public/stylesheets/scaffold.css or  
 app/assets/stylesheets/scaffold.css Page 16  
  
--- app/models/diamond\_brokers.rb -----------------------  
class DiamondBroker < ActiveRecord::Base**

**end  
--- app/models/cut\_diamonds.rb ---------------------------  
class CutDiamond < ActiveRecord::Base  
  
  
  
  
  
end**

**--- app/controllers/cut\_diamonds\_controller.rb ------------------  
class CutDiamondsController < ApplicationController  
   
 # GET /cut\_diamonds  
 # GET /cut\_diamonds.json  
 def index  
 @cut\_diamonds = CutDiamond.all  
 respond\_to do |format|  
 format.html # index.html.erb  
 format.json { render json: @cut\_diamonds }  
 end  
 end  
  
 # GET /cut\_diamonds/1  
 # GET /cut\_diamonds/1.json  
 def show  
 @cut\_diamond = CutDiamond.find(params[:id])  
 respond\_to do |format|  
 format.html # show.html.erb  
 format.json { render json: @cut\_diamond }  
 end  
 end  
   
 # GET /cut\_diamonds/new  
 # GET /cut\_diamonds/new.json  
 def new  
 @cut\_diamond = CutDiamond.new  
 respond\_to do |format|  
 format.html # new.html.erb  
 format.json { render json: @cut\_diamond }  
 end  
 end  
  
 # GET /cut\_diamonds/1/edit  
 def edit  
 @cut\_diamond = CutDiamond.find(params[:id])  
 end  
  
  
 # POST /cut\_diamonds  
 # POST /cut\_diamonds.json  
 def create  
 @cut\_diamond = CutDiamond.new(params[:cut\_diamond])  
 respond\_to do |format|  
 if @cut\_diamond.save  
 format.html { redirect\_to @cut\_diamond,   
 notice: 'Cut diamond was successfully created.' }  
 format.json { render json: @cut\_diamond,   
 status: :created, location: @cut\_diamond }  
 else  
 format.html { render action: "new" }  
 format.json { render json: @cut\_diamond.errors,   
 status: :unprocessable\_entity }  
 end  
 end  
 end  
 # PUT /cut\_diamonds/1  
 # PUT /cut\_diamonds/1.json  
 def update  
 @cut\_diamond = CutDiamond.find(params[:id])  
 respond\_to do |format|  
 if @cut\_diamond.update\_attributes(params[:cut\_diamond])  
 format.html { redirect\_to @cut\_diamond,   
 notice: 'Cut diamond was successfully updated.' }  
 format.json { head :ok }  
 else  
 format.html { render action: "edit" }  
 format.json { render json: @cut\_diamond.errors,   
 status: :unprocessable\_entity }  
 end  
 end  
 end  
  
 # DELETE /cut\_diamonds/1  
 # DELETE /cut\_diamonds/1.json  
 def destroy  
 @cut\_diamond = CutDiamond.find(params[:id])  
 @cut\_diamond.destroy  
 respond\_to do |format|**

**format.html { redirect\_to cut\_diamonds\_url }  
 format.json { head :ok }  
 end   
 end  
end**

**--- app/views/diamond\_brokers/\_form.html.erb ---------------------  
<%= form\_for(@diamond\_broker) do |f| %>**

**<% if @diamond\_broker.errors.any? %>**

**<div id="error\_explanation">**

**<h2><%= pluralize(@diamond\_broker.errors.count, "error") %>   
 prohibited this diamond\_broker from being saved:</h2>**

**<ul>**

**<% @diamond\_broker.errors.full\_messages.each do |msg| %>**

**<li><%= msg %></li>**

**<% end %>**

**</ul>**

**</div>**

**<% end %>**

**<div class="field">**

**<%= f.label :name %><br />**

**<%= f.text\_field :name %>**

**</div>**

**<div class="field">**

**<%= f.label :phone %><br />**

**<%= f.text\_field :phone %>**

**</div>**

**<div class="field">**

**<%= f.label :address %><br />**

**<%= f.text\_area :address %>**

**</div>**

**<div class="field">**

**<%= f.label :license\_no %><br />**

**<%= f.text\_field :license\_no %>**

**</div>**

**<div class="actions">**

**<%= f.submit %>**

**</div>**

**<% end %>**

**--- app/views/diamond\_brokers/index.html.erb ---------------------   
<h1>Listing diamond\_brokers</h1>**

**<table>**

**<tr>**

**<th>Name</th>**

**<th>Phone</th>**

**<th>Address</th>**

**<th>License no</th>**

**<th></th>**

**<th></th>**

**<th></th>**

**</tr>**

**<% @diamond\_brokers.each do |diamond\_broker| %>**

**<tr>**

**<td><%= diamond\_broker.name %></td>**

**<td><%= diamond\_broker.phone %></td>**

**<td><%= diamond\_broker.address %></td>**

**<td><%= diamond\_broker.license\_no %></td>**

**<td><%= link\_to 'Show', diamond\_broker %></td>**

**<td><%= link\_to 'Edit', edit\_diamond\_broker\_path(diamond\_broker) %></td>**

**<td><%= link\_to 'Destroy', diamond\_broker,   
 confirm: 'Are you sure?', method: :delete %></td>**

**</tr>**

**<% end %>**

**</table>**

**<br />**

**<%= link\_to 'New Diamond broker', new\_diamond\_broker\_path %>**

**--- app/views/diamond\_brokers/show.html.erb  
<p id="notice"><%= notice %></p>**

**<p>**

**<b>Name:</b>**

**<%= @diamond\_broker.name %>**

**</p>**

**<p>**

**<b>Phone:</b>**

**<%= @diamond\_broker.phone %>**

**</p>**

**<p>**

**<b>Address:</b>**

**<%= @diamond\_broker.address %>**

**</p>**

**<p>**

**<b>License no:</b>**

**<%= @diamond\_broker.license\_no %>**

**</p>**

**<%= link\_to 'Edit', edit\_diamond\_broker\_path(@diamond\_broker) %> |**

**<%= link\_to 'Back', diamond\_brokers\_path %>**

**--- app/views/diamond\_brokers/new.html.erb ------------------------  
<h1>New diamond\_broker</h1>**

**<%= render 'form' %>**

**<%= link\_to 'Back', diamond\_brokers\_path %>**

**class CutDiamondsController < ApplicationController**

**# GET /cut\_diamonds**

**# GET /cut\_diamonds.json**

**def index**

**@cut\_diamonds = CutDiamond.all**

**respond\_to do |format|**

**format.html # index.html.erb**

**format.json { render json: @cut\_diamonds }**

**end**

**end**

**# GET /cut\_diamonds/1**

**# GET /cut\_diamonds/1.json**

**def show**

**@cut\_diamond = CutDiamond.find(params[:id])**

**respond\_to do |format|**

**format.html # show.html.erb**

**format.json { render json: @cut\_diamond }**

**end**

**end**

**# GET /cut\_diamonds/new**

**# GET /cut\_diamonds/new.json**

**def new**

**@cut\_diamond = CutDiamond.new**

**respond\_to do |format|**

**format.html # new.html.erb**

**format.json { render json: @cut\_diamond }**

**end**

**end**

**# GET /cut\_diamonds/1/edit**

**def edit**

**@cut\_diamond = CutDiamond.find(params[:id])**

**end**

**# POST /cut\_diamonds**

**# POST /cut\_diamonds.json**

**def create**

**@cut\_diamond = CutDiamond.new(params[:cut\_diamond])**

**respond\_to do |format|**

**if @cut\_diamond.save**

**format.html { redirect\_to @cut\_diamond,   
 notice: 'Cut diamond was successfully created.' }**

**format.json { render json: @cut\_diamond,   
 status: :created, location: @cut\_diamond }**

**else**

**format.html { render action: "new" }**

**format.json { render json: @cut\_diamond.errors,   
 status: :unprocessable\_entity }**

**end**

**end**

**end**

**# PUT /cut\_diamonds/1**

**# PUT /cut\_diamonds/1.json**

**def update**

**@cut\_diamond = CutDiamond.find(params[:id])**

**respond\_to do |format|**

**if @cut\_diamond.update\_attributes(params[:cut\_diamond])**

**format.html { redirect\_to @cut\_diamond,   
 notice: 'Cut diamond was successfully updated.' }**

**format.json { head :ok }**

**else**

**format.html { render action: "edit" }**

**format.json { render json: @cut\_diamond.errors,   
 status: :unprocessable\_entity }**

**end**

**end**

**end**

**# DELETE /cut\_diamonds/1**

**# DELETE /cut\_diamonds/1.json**

**def destroy**

**@cut\_diamond = CutDiamond.find(params[:id])**

**@cut\_diamond.destroy**

**respond\_to do |format|**

**format.html { redirect\_to cut\_diamonds\_url }**

**format.json { head :ok }**

**end**

**end**

**end**

**--- app/views/cut\_diamonds/\_form.html.erb -------------------**

**<%= form\_for(@cut\_diamond) do |f| %>**

**<% if @cut\_diamond.errors.any? %>**

**<div id="error\_explanation">**

**<h2><%= pluralize(@cut\_diamond.errors.count, "error") %> prohibited this cut\_diamond from being saved:</h2>**

**<ul>**

**<% @cut\_diamond.errors.full\_messages.each do |msg| %>**

**<li><%= msg %></li>**

**<% end %>**

**</ul>**

**</div>**

**<% end %>**

**<div class="field">**

**<%= f.label :carats %><br />**

**<%= f.text\_field :carats %>**

**</div>**

**<div class="field">**

**<%= f.label :color %><br />**

**<%= f.text\_field :color %>**

**</div>**

**<div class="field">**

**<%= f.label :clarity %><br />**

**<%= f.text\_field :clarity %>**

**</div>**

**<div class="actions">**

**<%= f.submit %>**

**</div>**

**<% end %>**

**--- app/views/cut\_diamonds/index.html.erb -------------------------  
<h1>Listing cut\_diamonds</h1>**

**<table>**

**<tr>**

**<th>Carats</th>**

**<th>Color</th>**

**<th>Clarity</th>**

**<th></th>**

**<th></th>**

**<th></th>**

**</tr>**

**<% @cut\_diamonds.each do |cut\_diamond| %>**

**<tr>**

**<td><%= cut\_diamond.carats %></td>**

**<td><%= cut\_diamond.color %></td>**

**<td><%= cut\_diamond.clarity %></td>**

**<td><%= link\_to 'Show', cut\_diamond %></td>**

**<td><%= link\_to 'Edit', edit\_cut\_diamond\_path(cut\_diamond) %></td>**

**<td><%= link\_to 'Destroy', cut\_diamond, confirm: 'Are you sure?', method: :delete %></td>**

**</tr>**

**<% end %>**

**</table>**

**<br />**

**<%= link\_to 'New Cut diamond', new\_cut\_diamond\_path %>**

**--- app/views/cut\_diamonds/show.html.erb -------------------------**

**<p id="notice"><%= notice %></p>**

**<p>**

**<b>Carats:</b>**

**<%= @cut\_diamond.carats %>**

**</p>**

**<p>**

**<b>Color:</b>**

**<%= @cut\_diamond.color %>**

**</p>**

**<p>**

**<b>Clarity:</b>**

**<%= @cut\_diamond.clarity %>**

**</p>**

**<%= link\_to 'Edit', edit\_cut\_diamond\_path(@cut\_diamond) %> |**

**<%= link\_to 'Back', cut\_diamonds\_path %>**

**--- app/views/cut\_diamonds/new.html.erb ---------------------------**

**<h1>New cut\_diamond</h1>**

**<%= render 'form' %>**

**<%= link\_to 'Back', cut\_diamonds\_path %>**

**--- app/views/layouts/application.html.erb ------------------------  
<!DOCTYPE html>**

**<html>**

**<head>**

**<title>ChicagoDiamonds</title>**

**<%= stylesheet\_link\_tag "scaffold" %>**

**<%= javascript\_include\_tag "application" %>**

**<%= csrf\_meta\_tags %>**

**</head>**

**<body>**

**<%= yield %>**

**</body>**

**</html>  
  
  
  
  
  
  
  
--- public/stylesheets/scaffold.css or**

**app/assets/stylesheets/scaffold.css -------------------------  
body { background-color: #fff; color: #333;**

**font-family: verdana, arial, helvetica, sans-serif;**

**font-size: 13px; line-height: 18px; }**

**p, ol, ul, td { font-family: verdana, arial, helvetica, sans-serif;**

**font-size: 13px; line-height: 18px; }**

**pre { background-color: #eee; padding: 10px; font-size: 11px; }**

**a { color: #000;**

**&:visited { color: #666; }**

**&:hover { color: #fff; background-color: #000; } }**

**div {**

**&.field, &.actions { margin-bottom: 10px; } }**

**#notice { color: green; }**

**.field\_with\_errors { padding: 2px; background-color: red;**

**display: table; }**

**#error\_explanation { width: 450px; border: 2px solid red;**

**padding: 7px; padding-bottom: 0; margin-bottom: 20px;**

**background-color: #f0f0f0;**

**h2 { text-align: left; font-weight: bold;   
 padding: 5px 5px 5px 15px;**

**font-size: 12px; margin: -7px; margin-bottom: 0px;**

**background-color: #c00; color: #fff; }**

**ul li { font-size: 12px; list-style: square; } }**