

BSCCS2003: Mock Questions with Solutions

1. Which of the following options is correct regarding statements I and II? [MCQ : 3 points]

Statement I: The controller is responsible for taking data from the model and giving it to the view to present it.

Statement II: The controller is responsible for taking data from the view and giving it to the model to perform certain actions.

- ☐ Only statement I is correct.
- ☐ Only statement II is correct.
- ✓ ☒ Both are correct.
- ☐ Both are incorrect.

Solution: The controller is the intermediary between the model and the view. In case the user asks for a certain resource using end point directly, then the controller takes the data from the model and gives it to the view to represent it. If the user uses HTML forms to take input that is to be updated in the database, then the controller takes this data from the view and passes it on to the model to perform the desired action.

2. Which of the following is/are valid IPv4 address(es)? [MSQ : 3 points]

- ☐ 192.168.201.261
- ✓ ☒ 192.102.89.39
- ✓ ☒ 192.188.25.67
- ☐ ::B2A9:95CD

Solution: An IPv4 address has the format x.x.x.x, where x is called an octet and must be a decimal value between 0 and 255. Octets are separated by periods. An IPv4 address must contain three periods and four octets. 192.102.89.39 and 192.188.25.67 are valid IPv4 addresses. ::B2A9:95CD is a valid IPv6 address.

3. For the statement given below:

curl http://localhost:8080

[MCQ : 3 Points]

Select the appropriate option that correctly maps different components of the given statement to their corresponding values from the below table.

Column 1	Column 2
1) curl	a) protocol
2) 8080	b) host name
3) http	c) command
4) localhost	d) port

✓ 1-c, 2-d, 3-a, 4-b

- ☐ 1-a, 2-c, 3-b, 4-d
- ☐ 1-c, 2-d, 3-b, 4-a
- ☐ None of the above

Solution: Here, “curl” is a command used to send a request.
“http” is the protocol.
“localhost” is the host name.
“5000” is the port number.

4. What is the difference between GET and HEAD HTTP request methods? [Descriptive : 4.5 points]

Solution: The server responds to a GET request with a header (meta information) and body (content) whereas body is not sent in the response by the server in case of a HEAD request.

5. Suppose you initiated the Python inbuilt HTTP server in a given directory that does not contain index.html file in its root directory, and you send a request to http://127.0.0.1:8000 using a browser. What will be rendered by the browser? [MCQ : 2 Points]
- ☐ A file name index.html will automatically be created and will be rendered.
 - ✓ ☐ The directory listing of the given directory will be displayed.
 - ☐ The browser will show an “Internal Server Error”.
 - ☐ The browser will show “Page not found error”.

Solution: When a request is sent at localhost and port number 8000 (default port used by Python HTTP server), the Python inbuilt HTTP server creates a directory listing for a given directory and displays it on the browser screen if the file index.html does not exist in the root directory.

6. How many characters can be encoded using 5 bits? [MCQ : 2 points]

- ☐ 8
- ☐ 16
- ☐ 64
- ✓ ☒ 32

Solution: Two different characters can be encoded using 1 bit. So, using 5 bits we can encode $2^5 = 32$ different characters.

7. How many bits are required to represent 'IITM' in ASCII? [MCQ : 2 Points]

- ☐ 12
- ☐ 24
- ✓ ☒ 32
- ☐ 35

Solution: ASCII standard uses 8 bits to encode each character. Since "IITM" has 4 characters, it follows that $4 \times 8 = 32$ bits are required to represent 'IITM'.

8. Let us assume a text document with word count of 500, this would be approximately 3000 characters (alphanumeric characters including spaces). Which of the following is the storage efficient way to encode a character? [MCQ : 2 Points]

- ☐ UCS-4 encoding
- ☐ ASCII encoding
- ☐ UCS-2 encoding
- ✓ ☒ Original 7-bit ASCII

Solution: Option 1) UCS-4 encoding: $32\text{b} \times 3000 = 96,000$ bits.
Option 2) ASCII encoding: $8\text{b} \times 3000 = 24,000$ bits.
Option 3) UCS-2 encoding: $16\text{b} \times 3000 = 48,000$ bits.
Option 4) Original 7-bit ASCII = $7\text{b} \times 3000 = 21,000$ bits
Hence, the storage efficient way to encode a character is Original 7-bit ASCII encoding.

9. Which of the following is correct syntax to check if the length of a list is equal to 10 in jinja2 template? [MCQ : 3 Points]

- ☐ {% if list | len = 10 %}
- ✓ {% if list | length == 10 %}
- ☐ {% if list | length = 10 %}
- ☐ {% if len(list) == 10 %}

Solution: The correct syntax to check if the length of a list variable is equal to 10 in jinja2 template is: {% if list | length == 10 %}.

10. What will be the output of the following Python code? [MCQ : 4.5 Points]

```
from jinja2 import Template
my_gadgets = {"first": "Television", "second": "Smart phone", "third": "Tablet",
              "fourth": "Computer"}
for item in my_gadgets:
    statement = Template("My {{item}} gadget is {{gadget}}.")
    print(statement.render(item = item, gadget = my_gadgets[item]))
```

- ☐ My First gadget is Television.
My Second gadget is Smart phone.
My Second gadget is Tablet.
My Fourth gadget is Computer.
- ✓ My first gadget is Television.
My second gadget is Smart phone.
My third gadget is Tablet.
My fourth gadget is Computer.
- ☐ My first gadget is Television.
My first gadget is Smart phone.
My first gadget is Tablet.
My first gadget is Computer.
- ☐ My first gadget is Television.
My second gadget is Television.
My third gadget is Television.
My fourth gadget is Television.

Solution: The Template function provides a string template where a dummy content is mentioned within the two curly brackets {{ }}.

The dummy content is then modified using the render function, where the dummy content can be replaced by actual content.

The argument of render function is provided as a key value pair.

11. Which of the following Python codes will generate the HTML code as given below?
[MCQ : 4.5 Points]

```
<!DOCTYPE html>
<html>
  <head>
    <title>
      Table
    </title>
  </head>
  <body>
    <table>
      <tr>
        <th>
          Namee
        </th>
        <th>
          Address
        </th>
      </tr>
      <tr>
        <td>
          James
        </td>
        <td>
          Hyderabad
        </td>
      </tr>
      <tr>
        <td>
          Dennis
        </td>
        <td>
          Chennai
        </td>
      </tr>
    </table>
  </body>
</html>
```

- ☐ from pyhtml import *
t = html(
 head(
 title('Table')))

```

    ),
    body(table(tr(th('Namee'),th('Address')),
                  td('James'),td('Hyderabad'),
                  td('Dennis'),td('Chennai'))
    )
)
print (t.render())
✓ from pyhtml import *

t = html(
    head(
        title('Table')
    ),
    body(table(tr(th('Namee'),th('Address')),
                  tr(td('James'),td('Hyderabad')),
                  tr(td('Dennis'),td('Chennai'))
    )
)

```

```
print (t.render())
```

○ from pyhtml import *

```

t = html(
    head(
        title('Table')
    ),
    body(
        table(tr(td('Namee'),td('Address')),
              tr(td('James'),td('Hyderabad')),
              tr(td('Dennis'),td('Chennai'))
        )
    )
)

```

```
print (t.render())
```

○ from pyhtml import *

```

t = html(
    head(
        title('Table')
    ),
    body(

```

```

        table(tr(th('Name'),th('Address')),
              tr(th('James'),th('Hyderabad')),
              tr(th('Dennis'),th('Chennai')))
        )
    )

print (t.render())

```

Solution:

Option 1: Invalid because all th() and td() are written in a single tr().

Option 2: Generates the required HTML code.

Option 3: Invalid because th() is missing in the code.

Option 4: Invalid because td() is missing in the code.

12. Given a table 'Players' where the column player_id is a unique field associating to only one player, how can you efficiently select the first 100 odd player_id values from the table?

(Assume the table contains well over 100 records with odd player_id values.) [MCQ: 3 points]

- ☐ SELECT * FROM Players ORDER BY player_id LIMIT 100;
- ☒ SELECT * FROM Players WHERE player_id % 2 = 1 ORDER BY player_id LIMIT 100;
- ☐ SELECT * FROM Players WHERE player_id % 2 = 0 ORDER BY player_id LIMIT 100;
- ☐ SELECT * FROM Players WHERE player_id = ODD ORDER BY player_id LIMIT 100;

Solution:

- Option 1: It will select first 100 players (both odd and even)
- Option 2: It will select first 100 odd players according to player_id.(correct option)
- Option 3: It will select first 100 even players according to player_id.
- Option 4: 'ODD' is not a valid SQL type.

13. Three HTML files from the template folder are given below. How will the flask app render the file 'test.html'? [MCQ: 4.5 points]

```

file 1: 'layout1.html'
<!DOCTYPE html>
<html lang="en">
<head>
  <title>Templates</title>
</head>
<body>
  <h2 style="color: red;"> This my red template </h2>
  {% block content %}    {% endblock %}
  <h2 style="color: red;"> This my red template </h2>
</body>
</html>

```

```

file 2: 'layout2.html'
<!DOCTYPE html>
<html lang="en">
<head>
  <title>Templates</title>
</head>
<body>
  <h2 style="color: blue;"> This my blue template </h2>
  {% block content %}    {% endblock %}
  <h2 style="color: blue;"> This my blue template </h2>
</body>
</html>

```

```

file 3: 'test.html'
{%extends "layout2.html" %}
{%block content%}
<h2>Welcome to Home</h2>
{% endblock %}

```

This my red template

Welcome to Home

This my red template



This my blue template

Welcome to Home

✓ **This my blue template**

This my red template

Welcome to Home

○ **This my blue template**

This my blue template

Welcome to Home

○ **This my red template**

Solution: This question is based on the concept of template inheritance. The template HTML file that we want to be rendered along with the main content depends on the extends block. The first line in the ‘test.html’ file `{% extends “layout2.html” %}` takes “layout2.html” as the template. The content within the `{% block %}` and `{% endblock %}` is the main content which can change page to page.

14. Consider the following two tables:

[MCQ : 3 Points]

Table 1: Instructors

Instructor_ID	Instructor_Name	Department_Name
101	Amit Dubey	Physics
102	Sarthak Gaur	English
103	Neha Sharma	English
104	Sumit Kumar	Chemistry
105	Himanshi Mehra	Mathematics

Table 2: Departments

Department_Name	Building_Name
English	B1
Mathematics	B2
Physics	B3
Chemistry	B2
Finance	B5

Which of the following queries will list the names of those departments which have more than one instructor?

- ☐ SELECT Department_Name from Departments INNER JOIN Instructors
ON Departments.Department_Name = Instructors.Department_Name
GROUP BY Departments.Department_Name
HAVING count(*) > 1;
- ☐ SELECT Departments.Department_Name from Departments INNER JOIN
Instructors
ON Departments.Department_Name = Instructors.Department_Name
GROUP BY Departments.Department_Name
WHERE count(*) > 1;
- ✓ ☒ SELECT Department_Name from Instructors
GROUP BY Department_Name
HAVING count(*) > 1;
- ☐ None of the above

Solution:

Option 1: The first query will generate an error as the column named “Department_Name” is present in both of the tables, which will lead to the ambiguity of which one is to be considered.

Option 2: The second query will also generate an error.

Option 3: The third query will result in “English” as it is the only department which has more than one instructor.

15. What will the following SQL code segment do?

```
SELECT * FROM Grocery
ORDER BY ToothpasteBrand, ModelNumber;
```

[MCQ: 3 points]

- ☐ It will first sort the grocery table according to the column ‘ToothpasteBrand’ and then override it by sorting the grocery table according to column ‘Model-Number’.

- ☐ It will sort the 'ToothpasteBrand' column and 'ModelNumber' column independently in ascending order.
- ✓ ☒ It will sort the grocery table according to column "ToothpasteBrand" in ascending order, and then according to the "ModelNumber" whenever the column "ToothpasteBrand" fields for two or more rows are equal.
- ☐ It will sort the grocery table according to the column "ModelNumber" only.

Solution: The correct SQL syntax for sorting the table according a particular field using ORDER BY is:

```
SELECT column1, column2, ...
FROM table_name
ORDER BY column1, column2, ... ASC|DESC;
```

The keyword ORDER BY sorts the given table in ascending order (default) of the column provided. If multiple column names are provided (column 1, column 2), it will first sort the table according to column1, and then by column2 whenever the column1 fields for two or more rows are equal.

16. Which of the following options is correct regarding the following code? [MCQ : 4.5 points]

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="UTF-8" />
    <title>Document</title>
    <style>
      .class1 {
        color: red;
      }
      .class2 {
        font-weight: bold;
      }
    </style>
  </head>
  <body>
    <div>
      <p class="class1 class2">
        Lorem ipsum dolor sit amet consectetur adipisicing elit. Quam accusamus
        incidunt harum aut eum deleniti officia?
      </p>
```

```
</div>  
</body>  
</html>
```

- ☐ The color of the text inside <p> tag will be red, but font weight will not be bold.
- ☐ Font weight of the text inside the <p> tag will be bold, but the color of the text will not be red.
- ☒ Font weight of the text inside the <p> tag will be bold and color will be red.
- ☐ Font weight of the text inside the <p> tag will be normal and color will be black.

Solution: You can use multiple classes for one HTML element. In that case, the style specified using all the classes will be applied on the element. Here, p element has two classes, class1 and class2. So, all the styles specified using these classes will be applied on the p element. So, Font weight of text inside the p element will be bold and color will be red.