

**MSc(IT), End Term Exam (May 2022)**  
**Web Programming IT629**

**Marks: 40**

**Duration: 2 hrs**

*Note: 1. There are two sections, Section A (Short Answers) and Section B (Subjective/Analytical)  
2. At the start of each question, the topic name is mentioned in bold.  
3. Please do not write unnecessary theory. Keep your answers to the point*

**Section A**

**2x5=10 marks**

Q1. Write short answers of the following.

- A. What is the difference between id and class?
- B. Write an arrow function in java script that display "End Term Exam" on the console.
- C. Write the three different ways of applying CSS to a web page.
- D. The use of the Virtual DOM abstraction in ReactJS enables the view rendering of a web application to happen either in the browser or ahead-of-time in the server. Write the advantages of having a web application do rendering on the server.
- E. Write key differences between No SQL database (such as MongoDB) and Relational database.

**Section B**

**(HTML and CSS)**

**2 marks**

Q2. Write the HTML/CSS code to create the following window on the web browser.

**Big on Sports**

Sports are fun and good for you ...

What is your favorite sport? ... And here is a short list:

1. Baseball
2. Basketball
3. Tennis
4. Soccer

Q3. If you take a good web application running in a window on a high-resolution desktop machine and gradually reduce the size of the window, you might notice that the web application shrinks everything in the view to fit into the smaller window but after some amount of shrinking web application radically alternatives its layout to work in the smaller window.

**3 marks**

a) Describe the mechanism used in a web application that would explain this behavior.

b) Write an example that supports the mechanism (you identified in (a)) using HTML5 and CSS3.

Q4. (Native JavaScript) Suppose an HTML page (exam.html) with the following code for the body section is given

**5 marks**

```
<body>
  <div id = "div1" title = "IT629">
    Whatever I feel like I want to write...
  </div>
  <script type = "text/javascript" src = "exam.js"></script>
</body>
```

Suppose you create an external JavaScript file and save it as exam.js. Now in this javascript file.

- Get the value of the title attribute of the element with the id of "div1" and send that value as an alert to the viewer.
- Create a new div element with the text "See you!" and add it to the document structure as a child of the div element with the id of "div1".

#### (Front End Framework-ReactJS)

Q5.a) What are the components in reactJS? What do you mean by stateful and stateless components?

3 marks

b) In which cases are function-based components preferred over Class-based components in ReactJS and vice versa. Please write the examples (in JSX) for a class-based component and function-based component. (Note: Assume the skeleton website structure created by the create-react-app tool where App.js is the main component js file)

(1+2+2) 5 marks

#### (NodeJS and MongoDB)

Q6. a) Given below is a nodeJS skeleton script file to connect to the local MongoDB database.

4 marks

```
var MongoClient = require('mongodb').MongoClient;
//Create a database named "IT629":
var url = "mongodb://localhost:27017/IT629";

MongoClient.connect(url, function(err, db) {
  < ---Write code 1 here--- >
```

```
});
```

```
< -----write code 2 here ----->
```

- Complete the following code (Code 1) with a short explanation of the working of the code.
- Write the Code 2 to create a collection("Student") and insert a document containing Name, course, and Institute ID as a field.

b) Consider the structure of the 'restaurants' collection:

4 marks

```
{
  "address": {
    "building": "1007",
    "coord": [ -73.856077, 40.848447 ],
    "street": " Near Indroda Circle",
    "zipcode": "10462"
  },
  "city": " Gandhinagar ",
  "cuisine": "Bakery",
  "grades": [
    { "date": { "$date": 1393804800000 }, "grade": "A", "score": 2 },
    { "date": { "$date": 1378857600000 }, "grade": "A", "score": 6 },
    { "date": { "$date": 1358985600000 }, "grade": "A", "score": 10 },
```

```

{ "date": { "$date": 1322006400000 }, "grade": "A", "score": 9 },
{ "date": { "$date": 1299715200000 }, "grade": "B", "score": 14 }
],
"name": "Indroda Circle Bake Shop",
"restaurant_id": "30075445"
}

```

Answer the following Questions

- Write a MongoDB query to display the fields restaurant\_id, name, <sup>city</sup>borough and cuisine for all the documents in the collection restaurant.
- Write a MongoDB query to find the restaurants who achieved a score more than 90.
- Write a MongoDB query to find the restaurants that do not prepare any cuisine of 'Indian' and their grade score of more than 70 and latitude less than -65.754168.
- Write a MongoDB query to find the restaurants which do not prepare any cuisine of 'Indian' and achieve a grade point 'A' not belonging to the city Gandhinagar. The document must be displayed according to the cuisine in descending order.

(ExpressJS)

Q7. Complete the following code to create a web server using an express web framework that listens to port number 5000 (and the root location is /user) and sends a response that contains "hello from <-your name and id->"

4 marks

```

//webserver.js
const express = require(-----)
const app = -----
const port = -----
app.get(-----)
app.listen(-----)

```

*Handwritten notes:*  
 Express:   
 require()   
 5000 port   
 "user" port