Short Answer:

Answer the following questions with complete sentences in your own words. You are encouraged to conduct your own research online or through other methods before answering the questions. If you research online, please consult multiple sources before you write down your answers. You are expected to be able to explain your answers in detail

1. What are undeclared and undefined variables?
2. What is a “closure” in JavaScript? Provide an example
3. What is lexical scope in JavaScript?
4. What is the difference between var and let?
5. How does this keyword work in JavaScript?
6. What is IIFE and what is Anonymous function? Why do we need them?
7. How to achieve Asynchronous in JavaScript?
8. What is Promise?
9. What is Prototype in JavaScript?
10. Can you name some new features in ES5 and ES6? And provide an example where you use them.
11. What is the output of following code and why?

```
(function(){
  var a = b = 3;
})();

console.log("a defined? " + (typeof a !== 'undefined'));
console.log("b defined? " + (typeof b !== 'undefined'));
```

12. What is the output of following code and why?

```
var myObject = {
    foo: "bar",
    func: function() {
        var self = this;
        console.log("outer func:  this.foo = " + this.foo);
        console.log("outer func:  self.foo = " + self.foo);
        (function() {
            console.log("inner func:  this.foo = " + this.foo);
            console.log("inner func:  self.foo = " + self.foo);
        }());
    }
};
myObject.func();
```

13. What is the output of following code and why?

```
(function() {
    console.log(1);
    setTimeout(function(){console.log(2)}, 1000);
    setTimeout(function(){console.log(3)}, 0);
    console.log(4);
})();
```

14. What is the output of following code and why?

```
console.log(1 +  "2" + "2");
console.log(1 +  +"2" + "2");
console.log(1 +  -"1" + "2");
console.log(+"1" +  "1" + "2");
console.log( "A" - "B" + "2");
console.log( "A" - "B" + 2);
```

15. What is the output of following code and why?

```
var hero = {
    _name: 'John Doe',
    getSecretIdentity: function (){
        return this._name;
    }
};

var stoleSecretIdentity = hero.getSecretIdentity;

console.log(stoleSecretIdentity());
console.log(hero.getSecretIdentity());
```

16. What is the output of the following code and why?

```
(function(x) {
    return (function(y) {
        console.log(x);
    })(2)
})(1);
```

Coding Questions:

Write code in Java to solve following problems. Please write your own answers. You are highly encouraged to present more than one way to answer the questions. Please follow best practice when you write the code so that it would be easily readable, maintainable, and efficient. Clearly state your assumptions if you have any. You may discuss with others on the questions, but please write your own code.

1. Create a constructor function called Hero That will accept the arguments name and occupation.
   A. Use Hero.prototype to add a method whoAreYou that will return: My name is [the hero's name] and I am a [the hero's occupation].
   B. Use the Hero constructor to create an object hero1 with the name Michaelangello and occupation Ninja.
   C. Use the whoAreYou method to log to the console hero1's name and occupation.

2. Create a progress bar with HTML, CSS and Javascript (No jQuery) with two buttons — increase: add 5% to current progress bar; decrease: remove 5% to current progress bar

3. Student Management System (JavaScript and jQuery)

(1). On page load fire an ajax request load json file and list on the student details in tabular format.

a. Show only 10 record at a time
b. Provide a dropdown with option to select 20, 50, 100 records to display

(2). Once the ajax response is received. It needs to be saved in local storage as well.

(3). Sample json should contain details of multiple students (array of JSON objects)

```
a. [
        {
                "firstname" : "Zack",
                "lastname" : "Yu",
                "email" : "zack@beaconfire.com",
                "location" : ["Princeton", “Newyork”, “California”],
                "phone" : "2021231234",
                "address" : {
                        "communication": "Beaconfire, Princeton, New Jersey",
```

```
                "permanent" : "China"
            },
            "marks" : {
                "english" : "70",
                "science" : "80",
                "computers" : "90",
                "hardware" : "80"
            }
        }
]
```

b. Note : create multiple objects in json array, minimum of 10 objects. Create a simple json array using javascript loop and convert to json string using json stringify

(4). List should intially show only firstname, lastname, email, location, phone, address and options to "show more details", "edit", "delete". once a change is made it should update the localStorage as well.

(5). Above the list container create a form to add new students with all the details mentioned in the sample JSON.

a. once a new student is added it should update the localstorage as well.

b. Add form should provide option to add multiple locations. Use drag and drop to add multiple locations.

(6). Provide a search form, so that the user can search students based on firstname, lastname, location and phone. (Optional)

(7). Once you finish all the above steps. Try to incorporate window.scroll event (Op)

a. Once the window is scrolled down till the end you should fetch more objects from local storage and append it with the existing result

b. Once all the data is displayed show “No more records” message and kill the stop the scroll event.