

# Indian Institute of Technology, Madras - BS in Data Science and Applications

## Notations :

- 1.Options shown in green color and with ✓ icon are correct.
- 2.Options shown in red color and with ✗ icon are incorrect.

**Question Paper Name :**

IIT M FOUNDATION AN4 EXAM QPF4 16  
JULY 2023

**Subject Name :**

2023 July: IIT M FOUNDATION AN4 EXAM  
QPF4

**Creation Date :**

2023-07-10 18:54:05

**Duration :**

240

**Total Marks :**

705

**Display Marks:**

Yes

**Share Answer Key With Delivery Engine :**

Yes

**Actual Answer Key :**

Yes

**Calculator :**

Scientific

**Magnifying Glass Required? :**

No

**Ruler Required? :**

No

**Eraser Required? :**

No

**Scratch Pad Required? :**

No

**Rough Sketch/Notepad Required? :**

No

**Protractor Required? :**

No

**Show Watermark on Console? :**

Yes

**Highlighter :**

No

**Auto Save on Console?**

Yes

**Change Font Color :**

No

This program generates the output:  
You got 34 tickets  
Tickets sold out  
You got 34 tickets  
6406531929222. ✓

This program generates the output:  
You got 34 tickets  
You got 34 tickets  
6406531929223. ✖

This program generates the output:  
You got 34 tickets  
Tickets sold out  
6406531929224. ✖

## AppDev2

Section Id :	64065339064
Section Number :	14
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	17
Number of Questions to be attempted :	17
Section Marks :	50
Display Number Panel :	Yes
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	64065382537
Question Shuffling Allowed :	No

Is Section Default? : null

Question Number : 265 Question Id : 640653577711 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "DIPLOMA LEVEL : MODERN APPLICATION DEVELOPMENT II (COMPUTER BASED EXAM)"

ARE YOU SURE YOU HAVE TO WRITE EXAM FOR THIS SUBJECT?  
CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN.

(IF IT IS NOT THE CORRECT SUBJECT, PLS CHECK THE SECTION AT THE [TOP](#) FOR THE SUBJECTS REGISTERED BY YOU)

Options :

6406531929233.  YES

6406531929234.  NO

Sub-Section Number : 2

Sub-Section Id : 64065382538

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 266 Question Id : 640653577712 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

Suppose you are given the below HTML.

```
<body>
  <p id = "id1" class = "class1">Content A</p>      <!-- Statement 1 -->
  <p id = "id2" class = "class1">Content B</p>      <!-- Statement 2 -->
</body>
```

Which of the following code(s) can be used to access the HTML paragraph element at "Statement 1" using JavaScript?

**Options :**

6406531929235. ✖ document.getElementById("id2")

6406531929236. ✔ document.getElementById("id1")

6406531929237. ✖ document.getElementsByClassName("class1")

6406531929238. ✔ document.getElementsByClassName("class1")[0]

**Question Number : 267 Question Id : 640653577717 Question Type : MSQ Is Question**

**Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 2 Max. Selectable Options : 0**

Question Label : Multiple Select Question

Which of the following is/are not example(s) of system level state?

**Options :**

6406531929255. ✔ Gmail Inbox of a given user

6406531929256. ✖ User database of LinkedIn

6406531929257. ✔ YouTube Recommendations after signing in

6406531929258. ✔ Countdown timer in a game

**Question Number : 268 Question Id : 640653577720 Question Type : MSQ Is Question**

**Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 2 Max. Selectable Options : 0**

Question Label : Multiple Select Question

Which of the following statements is/are true?

**Options :**

6406531929267. ✔ Lexical scope describes how the parser resolves the variable name in case of nested functions.

6406531929268. ✔ Inner functions have access to the outer functions variables in JavaScript.

6406531929269. ✘ Inner functions do not have access to the outer functions variables in JavaScript.

6406531929270. ✘ None of these.

<b>Sub-Section Number :</b>	3
<b>Sub-Section Id :</b>	64065382539
<b>Question Shuffling Allowed :</b>	Yes
<b>Is Section Default? :</b>	null

**Question Number : 269 Question Id : 640653577713 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 2**

Question Label : Multiple Choice Question

Which of the following statements is correct regarding "<noscript>" tag in HTML?

**Options :**

6406531929239. ✘ This tag is used to insert the JavaScript code to be run when the page opens.

6406531929240. ✔ This tag is used to insert HTML, if the browser doesn't support script or is disabled.

6406531929241. ✘ This tag, if used in a web page, does not let the browser cache the page contents.

6406531929242. ✘ None of these

<b>Sub-Section Number :</b>	4
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Sub-Section Id : 64065382540

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 270 Question Id : 640653577715 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the below JavaScript program, and predict the output, if executed.

```
class Person {
  constructor(name) {
    this.name = name;
    this.age = 23;
  }
  static fromJson(obj) {
    let new_obj = new Person(obj.name);
    new_obj.sound = obj.sound;
    return new_obj;
  }
}
result = new Person('Abhi');
console.log(Person.fromJson(JSON.parse(JSON.stringify(result))).constructor.name);
```

Options :

6406531929247. ✓ Person

6406531929248. ✗ Abhi

6406531929249. ✗ constructor

6406531929250. ✗ Reference Error

Question Number : 271 Question Id : 640653577716 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the below JavaScript program, and predict the output, if executed.

```
let x = 50;
const obj1 = {
  x : 10,
  func : function () {
    console.log(this.x)
  }
}

const obj2 = {
  x : 20,
  func : () => {
    function abc () {
      console.log(x, "and", this.x)
      obj1.func.call(this)
    }
    abc()
  }
}

obj2.func()
```

Options :

6406531929251. ✖ 50 and 20  
10

6406531929252. ✖ 50 and 20  
undefined

6406531929253. ✔ 50 and undefined  
undefined

6406531929254. ✖ 50 and undefined  
10

Question Number : 272 Question Id : 640653577718 Question Type : MCQ Is Question

Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

**Correct Marks : 3**

Question Label : Multiple Choice Question

Consider the below Vue application with markup file "index.html", and JavaScript file "app.js".

index.html:

```
<body>
  <div id = "app">
    <ol>
      <li v-for="item in items" :key="item.id">{{ item.name }}</li>
    </ol>
  </div>
</body>
<script src = "app.js"> </script>
```

app.js:

```
const a = new Vue({
  el : '#app',
  data : {
    items: [
      { id: 1, name: 'App Dev I Theory' },
      { id: 2, name: 'App Dev I Project' },
      { id: 3, name: 'App Dev II Theory' },
      { id: 4, name: 'App Dev II Project' }
    ]
  },
})
```

Suppose you open the "index.html" file in a browser, what will be rendered by the browser?

**Options :**

App Dev II Project  
App Dev II Theory  
App Dev I Project  
App Dev I Theory

6406531929259. ✖

App Dev I Theory  
App Dev I Project

6406531929260. ✖



App Dev II Theory  
App Dev II Project  
6406531929261. ✖

App Dev I Theory  
App Dev I Project  
App Dev II Theory  
App Dev II Project  
6406531929262. ✔

**Question Number : 273 Question Id : 640653577719 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 3**

Question Label : Multiple Choice Question

Consider the below Vue application with markup file "index.html", and javaScript file "app.js".

index.html:

```
<body>
  <div id = "app">
    <ol>
      <li v-for="item in items" :key="item.id">
        <blog-post :post-title = "item.name" :post-content =
"item.message"> </blog-post>
      </li>
    </ol>
  </div>
</body>
<script src = "app.js"> </script>
```

app.js:

```
Vue.component('blog-post', {
  props: {
    'postTitle' : String,
    'postContent' : String
  },
  template: `
    <div>
      <h3>{{ postTitle }}</h3>
      <p>{{ postContent }}</p>
    </div>
  `
})

const a = new Vue({
  el : '#app',
  data : {
    items: [
      { id: 1, name: 'IITM BS', message: "The World's first 4-year BS degree in DS and Applications"},
      { id: 2, name: 'IITM ES', message: "Learn Electronic Systems from top-notch IIT Madras faculty"},
      { id: 3, name: 'NPTEL', message: "Online Learning Initiatives by IITs and IISc"}
    ]
  },
})
```

Suppose you open the “index.html” file in a browser, what will be rendered by the browser?

**Options :**

1. IITM BS

2. IITM ES

6406531929263. ✖ 3. NPTEL

6406531929264. ✔

### 1. IITM BS

The World's first 4-year BS degree in DS and Applications

### 2. IITM ES

Learn Electronic Systems from top-notch IIT Madras faculty

### 3. NPTEL

Online Learning Initiatives by IITs and IISc

1. The World's first 4-year BS degree in DS and Applications

2. Learn Electronic Systems from top-notch IIT Madras faculty

6406531929265. ✖ 3. Online Learning Initiatives by IITs and IISc

#### A. NPTEL

Online Learning Initiatives by IITs and IISc

#### B. IITM ES

Learn Electronic Systems from top-notch IIT Madras faculty

#### C. IITM BS

6406531929266. ✖ The World's first 4-year BS degree in DS and Applications

**Question Number : 274 Question Id : 640653577721 Question Type : MCQ Is Question**

**Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction**

**Time : 0**

**Correct Marks : 3**

Question Label : Multiple Choice Question

Consider the following JavaScript program.

```
function doSomething(n, ...params) {  
  return params  
    .map((x) => {  
      return x ** n  
    })  
    .sort()  
}  
  
console.log(doSomething(2, 5, 10))
```

What will be logged on to console?

**Options :**

6406531929271. ✖ [5, 10]

6406531929272. ✖ [25, 100]

6406531929273. ✖ [10, 5]

6406531929274. ✔ [100, 25]

**Question Number : 275 Question Id : 640653577722 Question Type : MCQ Is Question**

**Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 3**

Question Label : Multiple Choice Question

Consider the following JavaScript program.

```
function coolerPlace({...obj }) {  
  let tmp = 0  
  let cty = null  
  Object.entries(obj).forEach(([city, temp]) => {  
    if (temp > tmp) {  
      cty = city  
    }  
  })  
  return cty  
}  
console.log(coolerPlace({ UP: 37, Delhi: 40 })))
```

What will be logged on to console?

**Options :**

6406531929275. ✖ UP

6406531929276. ✔ Delhi

6406531929277. ✖ 37

6406531929278. ✖ 40

**Question Number : 276 Question Id : 640653577723 Question Type : MCQ Is Question**

**Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 3**

Question Label : Multiple Choice Question

Consider the following JavaScript program.

```
const address1 = {
  state: 'Tamil Nadu',
  city: 'Chennai',
  place: 'IIT Madras',
  getAddress() {
    return `State: ${this.state}, city: ${this.city},
place:${this.place}`
  },
}

const address3 = {
  place: 'Taramani',
  __proto__: address1,
}

console.log(address3.getAddress())
```

What will be logged on to console?

**Options :**

6406531929279. ✔ State: Tamil Nadu, city: Chennai, place: Taramani

6406531929280. ✖ State: Tamil Nadu, city: Chennai, place: IIT Madras

6406531929281. ✖ State: , city: , place:Taramani

6406531929282. ✖ State: , city: , place:

**Question Number : 277 Question Id : 640653577724 Question Type : MCQ Is Question**

**Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 3**

Question Label : Multiple Choice Question

Consider the following JavaScript program.

```
let x = 1
let y = 2
{
  let x = 4
  let y = 5
}
function outer() {
  function inner() {
    return x + y
  }
  return inner
}
console.log(outer()())
```

What will be logged on to console?

**Options :**

6406531929283. ✖ 9

6406531929284. ✔ 3

6406531929285. ✖ NaN

6406531929286. ✖ undefined

**Sub-Section Number :** 5

**Sub-Section Id :** 64065382541

**Question Shuffling Allowed :** Yes

**Is Section Default? :** null

**Question Number : 278 Question Id : 640653577714 Question Type : MCQ Is Question**

**Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4.5**

**Question Label : Multiple Choice Question**

Consider the below JavaScript program, and predict the output. Also, predict the number of times the while loop will run.

```
function do_something(arr, val){
    var i1 = 0;
    var i2 = arr.length;
    while(i2 > i1){
        var i3 = Math.floor((i1 + i2)/2);
        if(val > arr[i3]){
            i1 = i3 + 1;
        }
        else if(val < arr[i3]){
            i2 = i3;
        }
        else{
            return true;
        }
    }
    return false;
}

result = do_something([3, 6, 34, 39, 48, 56, 78, 87], 40)
console.log(result)
```

Options :

6406531929243. ✖ ☐ true  
The while loop will run 3 times

6406531929244. ✖ ☐ false  
The while loop will run 4 times

6406531929245. ✔ ☒ false  
The while loop will run 3 times

6406531929246. ✖ ☐ true  
The while loop will run 4 times

**Question Number : 279 Question Id : 640653577725 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4.5**

Question Label : Multiple Choice Question

Consider the below Vue application with markup file "index.html", and JavaScript file "app.js".



app.js

```
new Vue({
  el: '#app',
  template: `<div> The nearest city to you is: {{minDistance}}
</div>`,
  data: {
    userCoordinate: [1, 2],
    allCooridates: [
      { name: 'City1', coodinate: [1, 7] },
      { name: 'City2', coodinate: [2, 4] },
      { name: 'City3', coodinate: [3, 5] },
      { name: 'City4', coodinate: [1, 4] },
    ],
  },
  methods: {
    calculateDistance(x, y) {
      return Math.abs(x[0] - y[0]) + Math.abs(x[1] - y[1])
    },
  },
  computed: {
    minDistance() {
      let minDist = Infinity
      let city = null
      this.allCooridates.forEach((cord) => {
        let d = this.calculateDistance(cord.coordinate,
this.userCoordinate)
        if (d < minDist) {
          minDist = d
          city = cord.name
        }
      })
      return city
    },
  },
})
```

index.html

```
<div id="app"></div>
<script
src="https://cdn.jsdelivr.net/npm/vue@2/dist/vue.js"></script>
<script src="./app.js"></script>
```

Suppose the application is running on <http://localhost:8080>.

What will be rendered by the browser?

**Options :**

6406531929287. ✖ The nearest city to you is: City1

6406531929288. ✖ The nearest city to you is: City2

6406531929289. ✖ The nearest city to you is: City3

6406531929290. ✔ The nearest city to you is: City4

**Question Number : 280 Question Id : 640653577726 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4.5**

Question Label : Multiple Choice Question

Consider the below Vue application with markup file “index.html”, and JavaScript file “app.js”.

app.js

```
new Vue({
  el: '#app',
  template: `<div>
    <input type='text' v-model='num'></input>
    <div id='lon'>Lucky or not? {{lucky?'Lucky':'Not Lucky'}}</div>
  </div>`,
  data: {
    num: 1,
    prev: 0,
    current: 1,
    lucky: false,
  },
  watch: {
    num(num1, num2) {
      if (num1 == '') {
        return
      }
      this.prev = this.current
      this.current = Number(num1)
      this.current > this.prev ? (this.lucky = true) : (this.lucky =
false)
    },
  },
})
```

index.html

```
<div id="app"></div>
<script
src="https://cdn.jsdelivr.net/npm/vue@2/dist/vue.js"></script>
<script src="./app.js"></script>
```

Suppose the application is running on '<http://localhost:8080>'. Suppose the user inputs 7 and then 5. What will be rendered inside the div with id 'lon'?

**Options :**

6406531929291. ✖ Lucky or not? Lucky

6406531929292. ✔ Lucky or not? Not Lucky

6406531929293. ✖ Lucky or not?

6406531929294. ✖ None of these

**Question Number : 281 Question Id : 640653577727 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4.5**

Question Label : Multiple Choice Question

Consider the below Vue application with markup file "index.html", and JavaScript file "app.js".

app.js

```
const Sender = {
  template: `<div> Message: <input type='text'
v-model='message'></input> </div>`,
  data() {
    return {
      message: null,
    }
  },
  watch: {
    message(msg) {
      this.$emit('newmsg', this.message)
    },
  },
}

const Receiver = {
  template: '<div id="msg"> {{msg}} </div>',
  props: ['msg'],
}

new Vue({
  el: '#app',
  template: `<div>
<Sender @newmsg = 'updateMessage' />
<Receiver :msg='message' />
</div>`,
  data: {
    message: null,
  },
  methods: {
    updateMessage(msg) {
      this.message = msg.split('').reverse().join('').toUpperCase()
    },
  },
  components: {
    Sender,
    Receiver,
  },
})
```

index.html

```
<div id="app"></div>
<script
src="https://cdn.jsdelivr.net/npm/vue@2/dist/vue.js"></script>
<script src="./app.js"></script>
```

Suppose the application is running on '<http://localhost:8080>'. If the user inputs 'hello' inside the input box, what will be rendered inside the div with ID 'msg'?

**Options :**

6406531929295. ✖ hello

6406531929296. ✖ HELLO

6406531929297. ✔ OLLEH

6406531929298. ✖ olleh

**MLT**

Section Id :	64065339065
Section Number :	15
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	13
Number of Questions to be attempted :	13
Section Marks :	50
Display Number Panel :	Yes
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	64065382542
Question Shuffling Allowed :	No
Is Section Default? :	null