

Goa University MCA Semester V End Semester Examination, 2018

Max marks: 40 CS 401 Software Engineering

Duration: Two Hours

- Q1. What are the drawbacks of Waterfall approach to software development? (5 marks)
- Q2. A process has should have following desirable properties- high quality and productivity, predictable and repeatable, support change. Analyze how an agile process such as Scrum performs on these properties? (5 marks)
- Q3. What is self-organizing in Scrum teams? Mention some of the tasks in Scrum that require self-organizing abilities. (5 marks)
- Q4. What are the primary responsibilities of (1) Scrum Master (2) Product Owner? Can scrum master and product owner be the same individual in a team? Justify your answer. (5 marks)
- Q5. What is refactoring? What are various reasons for refactoring? (5 marks)
- Q6. Identify and write some of the high priority user stories for a web based Learning management system such as Moodle from the viewpoint of Student and teacher. You should write them in user story format. Assign story point to these stories using 3,5,7,9 as story points. Break any two of these stories into tasks and assign time –units(in hours) to them. (5 marks)
- Q7. Name some of the “bad smells” in a code. (at least 10) and show how different types of refactoring can eliminate these bad smells. You may cite one or more refactorings for each of the bad smell. (10 marks)

Date: 19th April 2017**Web Technology**

Marks: 40

Duration: 120 Minutes

1. Begin each answer on a new page.
2. Answer any four questions.
3. Numbers after two dashes indicate marks allocated to the question.

Q 1

- a) Please study the XML file given in Appendix A of this question paper and write XPATH expressions to select following elements/attributes/values. (Terms in bold indicate elements/attributes/values to be selected).
1. Total number of medicines available.
 2. Names of medicines which are scheduled.
 3. Medicines (**tmid**) which can be given for 'fever'.
 4. Names of all medicines whose attribute **mid** starts with 'ABC'.
 5. Last five **medicine** from **medicines**.
- b) Create XSL style sheet, which given the XML file in Appendix A will list the names of all the health problem for which medicine 'paracetamol' is used. A sample output is shown in Appendix B. Output to be formatted using HTML

- 5
- 5

Q 2

- a) Write XML schema code (not DTD) to describe content model for following elements of XML file show in Appendix A. Apply **restrictions/validations/occurrence indicators** wherever appropriate based on information provided in Appendix A.
- i. Definition of **treatment** element (with all its attributes and member elements).
 - ii. Definition of **medicine** element (with all its attributes and member elements).
- b) Explain the difference between following terms
1. Well formed and valid XML
 2. KEY and UNIQUE element of XMLSchema.
 3. Linking DTD and Schema to XML document.
 4. Default namespace for XML elements and attributes.
 5. Entity verses entity reference in XML.

-- 2 + 3
-- 5

Q 3

- a) Answer the following questions.
- i. Creating animations using CCS3.
 - ii. When to use units px, em and vw.
 - iii. Two HTML tags which should not be used anymore and why.
- b) Use JavaScript/DOM to answer following questions.
- i. Need for *preventDefault* method of event object.
 - ii. Creating objects using object constructor in JavaScript.
 - iii. Using AJAX to fetch data from server

-- 2 + 2 + 1
-- 1 + 2 + 2

Q 4

Write notes on – minimum two pages each (any two)

- 1) HTTP
- 2) Common Gateway Interface
- 3) Page layout using CSS3
- 4) HTML 5 forms

- 5 + 5

Q 5

Write notes on – minimum two pages each (any two)

- 1) Drag and Drop support in HTML 5
- 2) Document Object Model (Core verses HTML)
- 3) Cookies and Session management
- 4) Simple API for XML - SAX

- 5 + 5

Appendix A

```

<?XML version="1.0"?>
<health xmlns="http://getwellsoon.com-2.0">
  <medicines>
    <medicine mid="ABC570021345892" ><name>Paracetamol</name><medicine>
    <medicine mid="PQR749930573993" ><name>Alegra120</name><medicine>
    <medicine mid="XYZ495840449943" scheduled="yes" ><name>Alwiz40</name><medicine>
    .....
  </medicines>
  <health-problems>
    <problem pid="P0001" >Blood Pressure</problem>
    <problem pid="P0002" >Allergy</problem>
    <problem pid="P0003" >Fever</problem>
  </health-problems>
  <treatment>
    <treat tmid="ABC570021345892" tpid="P0003" />
    <treat tmid="PQR749930573993" tpid="P0002" />
    <treat tmid="XYZ495840449943" tpid="P0001" />
    <treat tmid="ABC570021345892" tpid="P0002" />
  </treatment>
</health>

```

The XML file contains details of health problems and treatment offered.

medicines contains a **medicine** entry for every medicine available. **medicine** has a attribute called **mid** which is unique and is always three capital letters followed by 12 digits. The second attribute **scheduled** is optional and if present will always have the value 'yes'. **medicine** contains one single element **name** which contains the name of **medicine**.

health-problem contains entry for every **problem** a person can suffer from. **problem** has a attribute **pid** which uniquely identifies a **problem** ands has following format, letter P followed by four digits.

treatment tells us which **medicine** is given for which **problem**. Same **medicine** may may be given for more than one **problem**. Attributtes **tmid** and **tpid** refer to attributes **mid** of **medicine** and **pid** of **problem** repetively.

.... implies more such entries.

Appendix B

Medication : Paracetamol

Given for following conditions :

1. Fever
2. Allergy

60

Internet of Things (IoT)
ISA-2 (2018)

Max.Marks : 15 .

Time : 1hr

Instructions to candidates if any.

Answer all the questions :-

Every question carries 2 marks except the 4th question which carries 3 marks.

1. How does AWS help extend the capabilities of any IoT to the edge?
2. How can AWS securely connect constrained micro-controller based devices?
3. What is IOT with one click button as marketed by AWS ?
4. What are the functions of Hadoop NameNode and secondary Namenode?What is the purpose of a tasktracker heartbeat message ?
5. What are the stages of a Mapreduce job? Explain it with a suitable example.
6. Explain why CoAP is required for IoT devices instead of HTTP ?
explain CoAP :-
7. What are the principles of REST ?

Goa University MCA Semester IV End Semester Examination, 2019
CS 401 Software Engineering

Max marks: 40

Duration: Two Hours

Q1. What is the difference between evolutionary and throwaway prototyping? (5 marks)

Q2. A process should have following desirable properties- high quality and productivity, predictable and repeatable, support change. Agile framework such as “Scrum” supports these properties. Provide arguments in favour or against this statement. (5 marks)

Q3. In what way burndown chart helps in making progress during a sprint? What is team velocity? What is the relation between team velocity and burndown chart? (5 marks)

Q4. What happens in a daily standup meeting of Scrum team? What are the rules that are to be followed for a successful standup meeting? (5 marks)

Q5. What principles should be followed while refactoring? (5 marks)

Q6. What are the different types of refactoring techniques? Name and explain at least five, giving examples. (10 marks)

Q7. What are design patterns? Name and state the purpose of at least two design patterns. (5 marks)

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Q1. What are the drawbacks of Waterfall approach to software development? (5 marks)

Q2. A process has should have following desirable properties- high quality and productivity, predictable and repeatable, support change. Analyze how an agile process such as Scrum performs on these properties? (5 marks)

Q3. What is self-organizing in Scrum teams? Mention some of the tasks in Scrum that require self-organizing abilities. (5 marks)

Q4. What are the primary responsibilities of (1) Scrum Master (2) Product Owner? Can scrum master and product owner be the same individual in a team? Justify your answer. (5 marks)

Q5. What is refactoring? What are various reasons for refactoring? (5 marks)

Q6. Identify and write some of the high priority user stories for a web based Learning management system such as Moodle from the viewpoint of Student and teacher. You should write them in user story format. Assign story point to these stories using 3,5,7,9 as story points. Break any two of these stories into tasks and assign time –units(in hours) to them. (5 marks)

Q7. Name some of the “bad smells” in a code. (at least 10) and show how different types of refactoring can eliminate these bad smells. You may cite one or more refactorings for each of the bad smell. (10 marks)

MCA SEM IV END SEM EXAMINATION 2017

CS 401 Software Engineering

MAX MARKS 40

DURATION – TWO HOURS

Q1. Answer the following questions.

(2 marks each X 8= 16)

- a. What are the drawbacks of waterfall model?
- b. Discuss how a typical programmer spends time on the projects allotted to him/her. Which activities take the maximum time?
- c. Adding more manpower to delayed project results in further delaying the project. How far is this true and why is it true?
- d. What is unit testing? Who should perform unit testing?
- e. What is equivalence class partitioning? Is it a black box or white box testing approach?
- f. What is the role of Scrum master in Scrum team?
- g. How is burndown chart useful for project monitoring?
- h. State at least four most common “bad smells” that occur in code.

Q2. What is Software architecture? What are the characteristics of software architecture?

(4 marks)

Q3. Distinguish between top-down and bottom-up Integration testing strategies.

(4 marks)

Q4. You have seen that the following factors determine the user-friendliness of a design- Time to learn, Speed of performance, Rate of errors by users, Retention over time and Subjective satisfaction. Consider following applications and opine about which one of these factors would be more relevant for each of these applications with justification.

(5 mks)

- a. A web application for job searching
- b. A design package for an architect
- c. Online reservation system for a booking clerk at Railway booking counter.
- d. Medical diagnostic software
- e. Computer game

Q5. Compare the following interaction styles- Menu selection and direct manipulation. Is it advisable to use both of them or any one of them in your application? What type of users will be benefited from using these styles? (5 marks)

**MCA Sem IV Class Test -I
CS 401 Software Engineering**

Time- 60 minutes

Max.Marks – 20

Instruction

You can use one A4 sized paper handwritten on both sides as a cheat sheet. Please submit the cheat sheet along with the answer paper at the end of the exam.

Q1. Based on the views expressed by various researchers that were discussed in class, what according to you is Software Engineering and why do we need it? (5 marks)

Q2. Over the period software size and complexity has increased but correspondingly there is no much improvement in software developer productivity. What could be the reasons behind this and what are the consequence of this problem? (5 marks)

Q3. What are the issues involved in Requirements Engineering? How is the RE process organized?
(5 marks)

Q4. What are the classic “people mistakes” that could result in failure of software development efforts? How can we avoid them?
(5 marks)

MCA Sem IV Class Test -I
CS 401 Software Engineering

Time- 60 minutes

Max.Marks – 20

You can use one A4 sized paper handwritten on both sides as a cheat sheet. Please

Instruction

submit the cheat sheet along with the answer paper at the end of the exam.

Sr #	Question	True(T)/ False(F)
1	Requirements Engineering involves requirements elicitation	
2	Software Process are always informally specified	
3	It is possible to make drastic improvement in developer productivity by providing tools	
4	Abstraction is one of traditional software development phase	
5	Maintenance phase is smaller compared to Development in software life cycle	
6	Software Engineering does not involves use of version control tools	
7	IDE is an example of a good process	
8	Waterfall model is not advisable for requirements that are stable.	
9	Agile processes always result in quality software	
10	XP is an example of agile approach	
11	Spiral Model is based on Risk management principles	
12	Evolutionary prototyping results in better customer feedback	
13	Cost is not a factor to consider in software development	
14	One can use prototyping approach within spiral model	
15	Throwaway prototyping is used in implementation phase	
16	Agile process does not involve customer at all	
17	It is advisable to change tools in between development process	
18	Unified process is based on UML	
19	Verification means building the product right	
20	Introducing a new change is possible in waterfall model at any moment	

Date: 19th April 2017**Web Technology**

Marks: 40

Duration: 120 Minutes

1. Begin each answer on a new page.
2. Answer any four questions.
3. Numbers after two dashes indicate marks allocated to the question.

Q 1

- a) Please study the XML file given in Appendix A of this question paper and write XPATH expressions to select following elements/attributes/values. (Terms in bold indicate elements/attributes/values to be selected).
1. Total number of *medicines* available.
 2. Names of *medicines* which are *scheduled*.
 3. *Medicines* (*tmid*) which can be given for 'fever'.
 4. Names of all *medicines* whose attribute *mid* starts with 'ABC'.
 5. Last five medicine from *medicines*.
- 5
- b) Create XSL style sheet, which given the XML file in Appendix A will list the names of all the health problem for which medicine 'paracetamol' is used. A sample output is shown in Appendix B. Output to be formatted using HTML
- 5

Q 2

- a) Write XML schema code (not DTD) to describe content model for following elements of XML file show in Appendix A. Apply **restrictions/validations/occurrence indicators** wherever appropriate based on information provided in Appendix A.
- i. Definition of *treatment* element (with all its attributes and member elements).
 - ii. Definition of *medicine* element (with all its attributes and member elements).
- 2 + 3
- b) Explain the difference between following terms
1. Well formed and valid XML
 2. KEY and UNIQUE element of XMLSchema.
 3. Linking DTD and Schema to XML document.
 4. Default namespace for XML elements and attributes.
 5. Entity verses entity reference in XML.
- 5

Q 3

- a) Answer the following questions.
- i. Creating animations using CCS3.
 - ii. When to use units px, em and vw.
 - iii. Two HTML tags which should not be used anymore and why.
- 2 + 2 + 1
- b) Use JavaScript/DOM to answer following questions.
- i. Need for *preventDefault* method of event object.
 - ii. Creating objects using object constructor in JavaScript.
 - iii. Using AJAX to fetch data from server
- 1 + 2 + 2

Q 4

Write notes on – minimum two pages each (any two)

- 1) HTTP
- 2) Common Gateway Interface
- 3) Page layout using CSS3
- 4) HTML 5 forms

— 5 + 5

Q 5

Write notes on – minimum two pages each (any two)

- 1) Drag and Drop support in HTML 5
- 2) Document Object Model (Core verses HTML)
- 3) Cookies and Session management
- 4) Simple API for XML - SAX

— 5 + 5

Web Technology

Date: 21st Mar 2018

Marks: 20

Duration: 60 Minutes

-
1. Assume any Server Side Scripting language (SSSL) of your choice.
 2. Begin each question on new page. Numbers after dash indicates marks.
-

1. What is the difference between a **session** and a **permanent cookie**? What is the difference between **setting** and **unsetting** these type of cookies? What is the significance of **path** and **secure** field of the cookie? -- 4
2. What is the **difference** between the following
 - a. HTTP headers: content-encoding and transfer-encoding
 - b. HTTP methods: GET and POST
 - c. HTML form encoding: application/x-www-form-urlencoded and multipart/form-data-- 6
3. HTTP is supposed to be a **stateless** protocol. Why do we say so? What problems does **stateless** nature of HTTP pose when it comes to implementing web applications? -- 2
4. Explain how **persistent connections** and **conditional requests** are supported by HTTP. -- 2
5. What is request **redirection**? What support does HTTP offer to implement this feature? -- 2
6. With the help of an **example** properly describe any **two mechanisms** used to save application data from being lost when using CGI to implement the application. -- 4
7. Define **session** for a web application. How ~~are~~ following operations supported by SSSL (use same SSSL for answering all questions)? (*Any four*)
 - a. Find out which HTTP method was used to make the request.
 - b. Manage lifetime of a session.
 - c. Obtain IP address of the client (browser)
 - d. Access information submitted in the form.
 - e. Set a cookie in the response.-- 5

Web Technology

max. Marks : 20

Date : 7th Feb 2018

Duration : 75 Minutes

1. Assume HTML 5, CSS 3 and DOM 2
2. Begin each question on new page. Numbers after dash indicates marks.

1.
 - a. What are in your opinion, three most important new features available in HTML ver 5, that would contribute to more effectively designed web pages? - 3
 - b. LINK tag in HTML is used to define a link between a HTML page and external resource. The most obvious example being import of external stylesheet. With the help of example name at least two more uses of LINK tag. - 1
 - c. Name any two global attributes made newly available in HTML ver 5 and their purpose. - 1
2.
 - a. What is the difference between positioning HTML elements in absolute or relative manner? When should we use floating as technique for laying out HTML contents as opposed to positioning it? - 2
 - b. What is responsive web design? Discuss new features made available in CCS 3 and HTML 5 to support responsive web design. - 3
3.
 - a. What is the difference between event bubbling and event capture. How do we set up an event handler to control in which phase it will execute? - 2
 - b. With the help of example discuss the purpose of following method of event object?
 - event.stopPropagation() - 1
 - c. How would you add a new list item (LI) to the end of a list using only CORE DOM functionality? - 2
4.

What will be the outcome of executing following JavaScript code?

 - a. var type = typeof [1,2,3,4];
 - b. var num = Number(" ");
 - c. var cars = ["Saab", "Volvo", "BMW"];
var a = "Saab" in cars;
 - d. var obj1 = new Object(); obj1.num = 5;
var obj2 = new Object(); obj2.num = 5;
if (obj1 == obj2) return true else false;
 - e. "use strict" - 5
5.

How will you (Do not use JavaScript, except for sub question d)

 - a. Change the background color of text box inside a form only when it is selected for data entry?
 - b. Open the html page in new window when a hyper link is clicked?
 - c. Select all the siblings of a DIV element and hide their contents?
 - d. Check how many and which options of SELECT element have been selected?

Elective - Internet of Things 2019

Class Test -2

Max.Marks : 10

Time : 30 minutes.

Answer all questions:-

- 3) Build State chart for Elevator controller according to your own specification.
(5 marks)
- 4) Build FSM for traffic control system according to your own specification.
(5 marks)
•

Internet of Things (IoT)
ISA-2 (2018)

Max.Marks : 15 .
Time : 1hr

Instructions to candidates if any.

Answer all the questions :-

Every question carries 2 marks except the 4th question which carries 3 marks.

1. How does AWS help extend the capabilities of any IoT to the edge?
2. How can AWS securely connect constrained micro-controller based devices?
3. What is IOT with one click button as marketed by AWS ?
4. What are the functions of Hadoop NameNode and secondary Namenode?What is the purpose of a tasktracker heartbeat message ?.
5. What are the stages of a Mapreduce job? Explain it with a suitable example.
6. Explain why CoAP is required for IoT devices instead of HTTP ? explain CoAP :-
7. What are the principles of REST ?

Elective –Internet of Things-ISA 1 -2018

Max.Marks : 15

Time : 45 minutes.

Instructions if any.

- i) Answer all the questions.
- ii) This ISA-1 is aimed at assessing your awareness about IoT and its relevant technologies. Hence think clearly before writing .
- iii) each question carries 2 marks except question 7 which carries 3 marks

1. What are the 3 disruptive forces for Internet of things ? what do you understand by them ?
2. Name the 5 challenges for IoT. Explain briefly .
3. "Is IoT a new thing? Or is it a unicorn ? We have been doing this for past 40 years" . how do you interpret this statement ? write your take on it .
4. Draw Microsoft-azure solution architecture diagram and explain the key elements of the architecture.
5. What are the characteristics of IoT devices ? (constrained IoT devices)
6. Explain the following terms with respect to digital camera.
 - a) DCT
 - b) quantization
 - c) Huffman encoding.
7. Build statechart for elevator controller of your specifications.

MCA-SEMESTER IV End semester Exam April 2017
Internet of Things (IoT)

ax.Marks : 40

me : 2hrs.

Answer all the questions :-

1. a) Define IoT and important challenges for IoT:-
b) compare koomey's law and metcalf's law and how they affect as a disruptive forces fo IoT. (3+ 3 = 6 marks)
2. a) Draw block diagram of Microsoft Azure platform reference architeture for IoT.
b) Explain the following terms with respect to microsoft azure platform.
i) Field gateway ii)cloud protocol gateway iii) IoT hub iv) Event processing and insight. (5 marks)
3. a) what are the different enabling technologies for IoT? Explain :-
b) are the characteristics of embeddes system applicable to IoT ? If so what are the charatersitics of embedded system applicabel to IoT?
c) what are the role of quantization step in JPEG encoding for Digital camera? (3+ 3+ 2 = 8 marks)
4. a) Build statechart for 4-bit counter .
b) what are the problems associated with Finite state machine? How statechart can overcome these problems? (4+ 3 =7 marks)
5. a) what is big data? And what are the characteristics of big data ?
b) explain Hadoop Map reduce and HDFS with a suitable example :-
(3 + 4 = 7 marks)
6. explain the following terms:-
a) IBM bluemix b) Mahout and Hive in Hadoop c) virtualization in cloud computing d) PaaS vs IaaS in cloud computing. (7 marks)

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Max marks = 50

Time = 2 hr.

Instructions to candidates if any.

- a) Answer all the questions.
- b) There are two parts –part A and Part B
- c) Part A carries 30 marks (each question carries 3 marks)
- d) Part B carries 10 marks. (each question carries 5 marks)

Part A ($10 * 3 = 30$ marks)

1. What are the 3 disruptive forces for internet of things? What do you understand by them ?
2. "Is IoT a new thing? Or is it a unicorn ? we have been doing this for past 40 years". How do you interpret this statement? Write your take on this.
3. Draw Microsoft-azure architecture diagram and explain the key components of the architecture.
4. What are the characteristics of IoT devices?
5. How does AWS help extend the capabilities of any IoT to the edge?
6. How can AWS securely connect constrained microcontroller based IoT devices ?
7. What is IoT with one click button as marketed by AWS?
8. What are the stages of map reduce job ? explain it with a suitable example:-
9. Explain why CoAP is required to for the IoT devices instead of HTTP ? explain CoAP:-
10. Explain the following terms with respect to hadoop ?
 - a) Job tracker b) Name node c) HDFS

Part B ($5 * 2 = 10$ marks)

- 1) Draw state chart for 4 bit counter
- 2) Draw for finite state machine for seat belt controller with specifications in mind.
If the driver turns on the key and does not fasten the seat belt within 5 seconds, then an alarm beeps for 5 secs or until driver fastens the seat belt or until driver turns off key

**DEPARTMENT OF COMPUTER SCIENCE
GOA UNIVERSITY**

Elective -638 -Internet of Things (2019)

Max.Marks : 10

Time : 30 minutes

Answer all the questions :-

Q.NO 1)

- a) Define IoT as you understand :-**
- a) What effect will internet of things have our daily life ?**
- b) what should not be connected ? and why ?.**

(3 marks)

Q .No 2) with respect to digital camera example, indicate the purpose behind the following.

- a) Zero-bias adjustment .**
- b) DCT transform.**
- c) Huffman encoding.**

(4 marks)

Q.No 3) . the IOT processor should have a speed not less than 200 MHZ.

- a) is this a functional requirement or non-functional requirement ?**
- b) is this a constraining metric or an optimization metric ?.**
- c) Name at least two factors that determine the adequacy of the processor speed.**

(3 marks)

Web Technology

Marks: 40

Duration: 120 Minutes

Date: 10th April 2017

1. Begin each answer on a new page.
2. Answer any four questions.
3. Numbers after two dashes indicate marks allocated to the question.

Q 1

- a) Please study the XML file given in Appendix A of this question paper and write XPATH expressions to select elements/attributes/values. (Terms in bold indicate elements/attributes/values to be selected).
- i. **Total number of posts** for which election is being held.
 - ii. **Names** of persons who do not have an email address.
 - iii. **Total number of candidates** fighting for "members" post.
 - iv. **Athaar numbers** of last three *candidates* in the *candidate-list*.
 - v. **Names** of all the posts for which election is being held.
- 5
- b) Create XSL style sheet, which given the XML file in Appendix A will list the names of all the persons fighting election for Presidents posts. A sample output is shown in Appendix B. Output to be formatted using HTML - 5

Q 2

- a) Write XML schema code (not DTD) to describe content model for following elements of XML file show in Appendix A. Apply **restrictions/validations/occurrence indicators** wherever appropriate based on information provided in Appendix A.
- i. Definition of **candidate-list** element (with all its attributes and member elements) as it appears below *election* element.
 - ii. Definition of **post** element (with all its attributes) as it appears below *post-list* element.
- 3 + 2
- b) Create a DTD for defining same elements and attributes in the question above. Show how a DTD and XML Schema can be linked to XML document. Give four reasons to justify why XML Schema is a superior technique to define content model of an XML element as compared to DTD. - 2 + 1 + 2

Q 3

- a) Answer the following questions. Assuming CSS3.
- i. What is the difference between visibility: hidden and display: none?
 - ii. What are the different ways to integrate CSS with web page? Which technique is advised and why?
 - iii. How would you use CSS to create a stripped table?
 - iv. Is there any difference between specifying the size of a DIV element and size of a font using % unit of CSS?
 - v. What is the difference between using *transform* and *transition* properties?
- 5
- b) Use JavaScript/DOM to answer following questions.
- i. Explain why event object is important when writing event handlers?
 - ii. Explain how Regular Expressions can be used to search for a specific pattern in a string.
 - iii. Explain how to drag and drop an image using mouse?
- 1 + 2 + 2

Q 4

Write notes on – minimum two pages each (any two)

- a) Hyper Text Transfer Protocol
 - b) Using AJAX for creating web applications
 - c) Responsive Web Design
 - d) Differences between HTML 5 and HTML 4
- 5 + 5

Q 5

Write notes on – minimum two pages each (any two)

- a) Common Gateway Interface
 - b) SAX verses DOM for handling XML
 - c) Using MVC enabled framework for Server Side Scripting. (any framework of your choice)
 - d) Session management using Cookies and Hidden Fields
- 5 + 5

Appendix A

```

<?XML version="1.0"?>
<election xmlns="http://dummyorg.com/elections/schema/ver-2.0">
  <person-list>
    <person athaarno="570021345892" >
      <name>Pandurang Naik</name>
      <email>p.naik@gmail.com</email>
    </person>
    <person athaarno="239846384571" >
      <name>Victor D'Souza</name>
      <email>DVictor@yahoo.com</email>
    </person>
    <person athaarno="239846384571" >
      <name>Shyam Narvekar</name>
    </person>
  </person-list>
  <post-list>
    <post postid="P01" number="1">President</post>
    <post postid="P02" number="5">Member</post>
    <post postid="P03" number="1">Secretary</post>
  </post-list>
  <candidate-list>
    <candidate cadno="570021345892" cadpostid="P01" />
    <candidate cadno="239846384571" cadpostid="P01" />
    <candidate cadno="239846384571" cadpostid="P02" />
  </candidate-list>
</election>

```

The XML file contains details of election to be held in a organization. **person-list** contains a **person** entry for every member of the organization who is eligible stand for election. **person** has a attribute called **athaarno** which is always 12 digit long and is unique for every **person**. **name** element is always present. But a person may not have an **email** address.

post-list contains enetry for every **post** for which elections are to be held. **post** has two attributes, **postid** which uniquely identifies a **post** ands has following format, letter P followed by two digits. The other attribute is **number** which tells us how many posts of perticular type are there. This will always be positive number, maximum two digits in size.

candidate-list tells us which **person** is fighting election for which **post**. A **person** may stand for election for more than one type of **post**, i.e.Member as well as President. A **person** from **person-list** may also not fight election. Every **candidate** entry specifies which **person** is standing for which **post**. Attributtes **cadno** and **cadpostid** refer to attributes **athaarno** of **person** and **postid** of **post** repetively.

.... implies more such entries.

Appendix B

Post : President

Candidates :

1. Pandurang Naik
 2. Victor D' Souza
-

Duration: Two Hours

Max Marks:- 40

Answer any FOUR (4) Questions Each Question carries 10 marks

Q.1. What is “process” with respect to software development? What are the characteristics of process approach to software development? Explain with respect to ETVX approach.

Q.2. Describe spiral model of software development. How it is different from water fall model?

Q.3. What are the most important values in Agile Manifesto? How these values are achieved in Scrum?

Q.4. Explain the role of Scrum Master, Product Owner and Team member in Scrum. Also describe the various artifacts created in Scrum such as Product Backlog, Sprit Backlog, Scrum chart and burn down chart.

Q.5. What are user stories? What are the characteristics of user stories that you should try to achieve? Write 5 user stories related to development of Learning Management System such as Moodle.

Q.6. What is refactoring? Name some of the bad smells in a code? What are some of the refactoring techniques used to refactor code?

1. Begin each answer on a new page.
 2. Answer any four questions.
 3. Numbers after two dashes indicate marks allocated to the question.

Q 1

- (a) Please study the XML file given in Appendix A of this question paper and write XPATH expressions to select following elements/attributes/values. (Terms in bold indicate elements/attributes/values to be selected).
1. Total number teams from Asia playing in the World Cup..
 2. Names of players who are less than 30 years of age..
 3. Total number of goals scored against 'Serbia'.
 4. Names of all the players which are longer than 20 characters
 5. Names of all players who are in the lower half of players list.

- 5

- (b) Create XSL style sheet, which given the XML file in Appendix A will list the goals scored by the players. A sample output is shown in Appendix B. Output to be formatted using HTML.

- 5

Q 2

- (a) Write XML schema code (not DTD) to describe content model for following elements of XML file show in Appendix A. Apply restrictions/validations/occurrence indicators wherever appropriate based on information provided in Appendix A.
- i. Definition of players element (with all its attributes and member elements).
 - ii. Definition of scoreBy element (with all its attributes and member elements).

- 3 + 3

- b) Justify the importance of namespaces in XML. Show with the help of example , how despite having different prefixes, the elements can still belong to same namespace.

- 2

- c) What is the difference between well formed and valid XML document?

- 2

Q 3

- a) Write CSS3 rules to do the following
- i. Divide text on the screen into multiple columns.
 - ii. Increase height and width of an image over one second duration when cursor is moved on it.
 - iii. Change the background color of every-alternate table row to light blue.
 - iv. Hide part of the image which falls outside a predefined rectangular area.
 - v. Insert a small image at the end of every P tag present in the HTML file.

- 5

- b) Explain which HTML5 tags/attributes will be used to do the following and how.

- i. Associate character set with page so that it can be displayed properly by the browser.
- ii. Allow user to enter either pre-defined value or user supplied value in a form field.
- iii. Embed video into the page which plays automatically when page loads.
- iv. Specify a default URL for all the links in the page.
- v. Allow different parts of an image to act as links to different pages.

- 5

Q 4

- a) We have to design a page which shows goals scored by the two teams when a football match is in progress. The user will load the page once. Than as the match progresses and goals are scored, this information needs to be updated on the screen without reloading the entire page. Discuss in details what need to be done on the client side to make this possible.

- 5

- b) A new student needs to register online to join the MCA course after he/she is short listed for admission. His/her personal and academic details need to be captured and written to the database. Discuss how all the information can be received, processed and added to database on the server side. Use any Server Side Scripting language or MVC framework of your choice.

- 5

Q 5

Write notes on – minimum two pages each (any two)

- 1) Responsive web page design.
- 2) Using DOM/JavaScript to implement image slide show.
- 3) Managing session data using cookies and hidden fields.

- 5 + 5

Appendix A

```
<?XML version="1.0"?>
<worldCup xmlns="http://getwellsoon.com-2.0">
  <teams>
    <team tid="BRA" continent="America">Brazil</team>
    <team tid="SRB" continent="Europe">Serbia</team>
    <team tid="CRC" continent="America">Costa Rica</team>

  </teams>
  <players>
    <player pid="0001" tid="BRA" age="26">
      <name>Neymar da Silva Santos Júnior</name>
      <position>forward</position>
    </player>
    <player pid="0002" tid="ARG" age="30">
      <name>Lionel Andrés Messi Cuccittini</name>
      <position>forward</position>
    </player>
  </players>
  <score>
    <scoredBy pid="0001" />
    <against tid="SRB" goals="1" />
    <against tid="CRC" goals="3" />
  </scoredBy>
  </score>
</worldCup>
```

The XML file contains details of teams, players and goals scored by players in World Cup 2018. The root node is worldCup.

teams contains a team entry for every team playing in World Cup 2018. There are 32 teams in total. team has a attribute called tid which is unique and is always three capital letters. The continent attribute is self explanatory. The contents of team is name of the country.

players contains entry for every player playing in the World Cup. player has a attribute pid which uniquely identifies a player and is always four digits in length. The other attributes are tid which points to the team to which player belongs and age which is self explanatory. name element contains name of the player. position element tells us in which position the player plays. The valid values are Goalkeeper, Defender, Midfielder and Forward.

score contains elements scoredBy, but only those players who have scored any goal. scoredBy element will contain one or more against elements giving details of against which country (identified by attribute tid of against) has the player (identified by attribute pid of scoredBy) scored goals and how many (given by attribute goals of against). against entry will be present only if the player has scored goal against that team.

implies more similar entries.

Appendix B

Player Name : Neymar da Silva Santos Júnior
Goals Scored :
Against Serbia : 1
Against Costa Rica : 3

Player Name : Lionel Andrés Messi Cuccittini

implies more similar entries.

Pattern
Hard To

F

Max.Marks: 40

Time : 2 hrs

Answer all the questions:-

Part -A ($10 * 3 = 30$ marks)

1. How do you compare IoT devices with embedded system devices ?
2. Explain the significance of Metcalf's law for IoT revolution.
3. Explain the importance of non functional requirements of embedded system.
4. Explain the following terms.
 - a) IoT hub in Microsoft IoT architecture b) greengrass in AWS IoT.
5. Are IoT systems all reactive real time systems? Explain:-
6. Compare PaaS vs IaaS with a suitable example.
7. Give some applications of hadoop.
8. Explain MQTT protocol for IoT.
9. What were the limitations of early large scale computing ? and how does hadoop address these limitations ?
10. Moore's vs mealy FSM.

Part -B ($5 * 2 = 10$ marks)

- 1) **For the following specifications , draw moore's and mealy's FSM "Output a "1" on a sequence of 0,1,1 otherwise output 0"**
- 2) Compare FSM with statechart with suitable example.

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MCA Sem IV Class Test -II CS 401 Software Engineering
Time- 60 minutes
Max.Marks - 20

Instruction

- You can use one A4 sized paper handwritten on both sides as a cheat sheet. Please submit the cheat sheet along with the answer paper at the end of the exam.
- Answers MUST be provided in the order in which they appear in this question paper.

Consider that you are part of a scrum team working on a project to develop an **interactive web based Time-table and Attendance system for the department**. You may assume the client as Computer Science department for this exercise. This system will allow the department to define a time-table for all the courses it offers for MCA students consisting of theory and lab courses. Please note that time-table is prepared manually and later fed into this system. However, your system will allow modifications to time-table in terms of change in timing, classroom/laboratory etc once the first version of time-table is defined and uploaded in the system.

Time-table is integrated with course information system that provides information about teacher teaching the course and student enrolment for the course. (please note that your system will merely use this information).

Some of the services your system will provide to different stakeholders are-

1. Teachers- enable them to know their time-table schedule for all the courses that they teach, get reminders before the scheduled class, inform the system that a certain scheduled class(es) will not be engaged due to leave or some other work, record the attendance of students during class sessions.
2. Students- have their own personalized time-table based on the courses they have enrolled and corresponding lab course batches they belong to, inform in advance their absence for a course, Know their attendance status for courses enrolled.
3. Dept/HoD- monitor attendance status of the students, monitor syllabus & conduct of class by teachers, make minor changes to time table such as interchange of lecture timings, change in classroom etc.

Questions-->

- a. Create a Product Backlog(PB) by defining user stories based on above services as well as adding some of your own. (Minimum ten user stories). Assign a story point and priority for each of these stories. You can use 1,3,5,7,9 as story point values and High(H), Medium(M), and Low(L) as priority labels. (5 marks)
- b. Assume that your team velocity is 20 story points and sprint is of 4 weeks duration. Select the stories that will go into first Sprint backlog(SB). (2 marks)
- c. As part of sprint planning of Sprint 1, break the stories into tasks and show related duration in hours for all the stories from your SB. (5 marks)
- d. Draw the initial sprint burn-down chart in terms of hours as on first day of the sprint and plot entries for first two days of the sprint by assuming suitable completion of some tasks. (4 mks)
- e. Give some specific examples of self-organizing that takes place while adopting Scrum on a software project such as this. (2 marks)
- f. If you are a Scrum master of this team, what would you do if you notice that some team members are not reaching on time for Daily stand-up meeting? (1 mark)
- g. Can your immediate boss, who is not part of the team attend the daily stand-up meeting and give commands as to what the team or individual member should do? (1 mark)

MCA SEM IV END SEM EXAMINATION 2017

MAX MARKS 40

CS 401 Software Engineering

DURATION - TWO HOURS

Q1. Answer the following questions.

- a. What are the drawbacks of waterfall model? (2 marks each X 8 = 16)
- b. Discuss how a typical programmer spends time on the projects allotted to him/her.
Which activities take the maximum time?
- c. Adding more manpower to delayed project results in further delaying the project.
How far is this true and why is it true?
- d. What is unit testing? Who should perform unit testing?
- e. What is equivalence class partitioning? Is it a black box or white box testing approach?
- f. What is the role of Scrum master in Scrum team?
- g. How is burndown chart useful for project monitoring?
- h. State at least four most common "bad smells" that occur in code.

Q2. What is Software architecture? What are the characteristics of software architecture?
(4 marks)

Q3. Distinguish between top-down and bottom-up Integration testing strategies.
(4 marks)

Q4. You have seen that the following factors determine the user-friendliness of a design-
Time to learn, Speed of performance, Rate of errors by users, Retention over time and
Subjective satisfaction. Consider following applications and opine about which one of
these factors would be more relevant for each of these applications with justification.
(5 mks)

- a. A web application for job searching
- b. A design package for an architect
- c. Online reservation system for a booking clerk at Railway booking counter.
- d. Medical diagnostic software
- e. Computer game

Q5. Compare the following interaction styles- Menu selection and direct manipulation. Is
it advisable to use both of them or any one of them in your application? What type of
users will be benefited from using these styles? (5 marks)

Q6. Given below is a code of a class meant to generate prime numbers. Draw the cyclomatic complexity graph of the generatePrime() method and show how many minimum test cases are required to ensure statement coverage. (6 marks)

```
//prime numbers using sieve of Eratosthenes
public class GeneratePrime{
    public int[] generatePrimes(int maxValue) {
        if (maxValue <1)
            return new int[0];
        int s=maxValue+1;
        boolean[] f= new boolean[s];
        //initialize array
        for (int i=0; i< f.length;i++){
            f[i]=true;
        }
        //get rid of known primes
        f[0]=f[1]=false;
        //sieve
        for (int i =2; i< Math.sqrt(s)+1;i++){
            if (f[i]){//cross its multiples
                for (int j=2*s; j<s; j+=i){
                    f[j]=false;
                }
            }
        }
        //how many primes
        int count=0;
        for (int i=0; i<s;i++){
            if (f[i])
                count++;
        }
        int[] primes= new int [count];
        //copy sieve into result
        for (int k=0,l=0; l<s; l++ ){
            if (f[l])
                primes[k++]=l;
        }
        return primes;
    }
}
```

**MCA Sem IV Class Test –I
CS 401 Software Engineering**

Time- 60 minutes

Max.Marks – 20

Instruction

You can use one A4 sized paper handwritten on both sides as a cheat sheet. Please submit the cheat sheet along with the answer paper at the end of the exam.

Q1. Based on the views expressed by various researchers that were discussed in class, what according to you is Software Engineering and why do we need it? (5 marks)

Q2. Over the period software size and complexity has increased but correspondingly there is no much improvement in software developer productivity. What could be the reasons behind this and what are the consequence of this problem? (5 marks)

Q3. What are the issues involved in Requirements Engineering? How is the RE process organized?
(5 marks)

Q4. What are the classic “people mistakes” that could result in failure of software development efforts? How can we avoid them?
(5 marks)

Department of Computer Science
Internet of Things (IOT)-Class Test-2

Max.Marks : 15

Time : 1 hr

Answer all the questions briefly :-

- I) a) what do you understand by the term " Intel Galileo board is arduino compatible "?
b) Build state chart for 3-bit counter :- (4 marks)
- II) Explain the following terms with respect to cloud computing.
a) multitenancy b) role of virtualization (2 marks)
- III) a) What do the four V's of Big Data denote?
b) What are the main components of a Hadoop Application? (2 marks)
- IV) a) Why there was a need of YARN , a new framework in Hadoop 2.0?
b) What is the difference between MR1 in Hadoop 1.0 and MR2 in Hadoop2.0? (3 marks)
- V) a) What are the components of Apache Storm?
b) Explain briefly what do you understand by the term "topology" and "DAG"? with respect to the process of streams in apache storm:- (4 marks)

Internet of Things (IoT) –Supplementary Exam 2016

Max.Marks : 40

Time : 2 hr.

Answer all the questions :-

- 1) a) are IoT system always real time ? what do you understand by the term "real time"?
b) how do you compare Embedded system with IoT? (4 marks)
- 2) Explain the role of Huffman encoding in Digital camera with a suitable example.(5 marks).
- 3) What are the characteristics (non-functional requirements) of IoT device ? (3 marks).
- 4) What are the 3 different hadoop operation modes of Hadoop setup ? (2 marks)
- 5) Build state chart and FSM for elevator control system with specification of your choice.

(8 marks):
- 6) Explain the significance of cloud computing for IoT:- (3marks)
- 7) Explain the following terms with respect to big data:-
 - a) Why do you understand by the term "big data"?
 - b) RDBMs vs Hadoop . (3 marks)
- 8) Explain the following terms with respect to apache storm :-
 - a) Nimbus b) zoo keeper c) supervisor (3 marks)
 - b) Hadoop vs YARN vs Storm (2 marks)
 - c) Role of IBM blue mix for IoT. (2 marks)
 - d) Cognitive IoT (2marks)
- 9) Explain how data flows in hadoop storm ?(ie storm topology)(3 marks)

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