



ROLL NO: _____

PRESIDENCY UNIVERSITY, BENGALURU
SCHOOL OF ENGINEERING

Weightage: 20 %

Max Marks: 40

Max Time: 1 hr. Tuesday, 25th September 2018

TEST – 1

Odd Semester 2018-19

Course: **CSE 216 SOFTWARE ENGINEERING**

V Sem. CSE

Instruction:

- (i) Read the question properly and answer accordingly.
- (ii) Question paper consists of 3 parts.
- (iii) Scientific and Non-programmable calculators are permitted

Part A

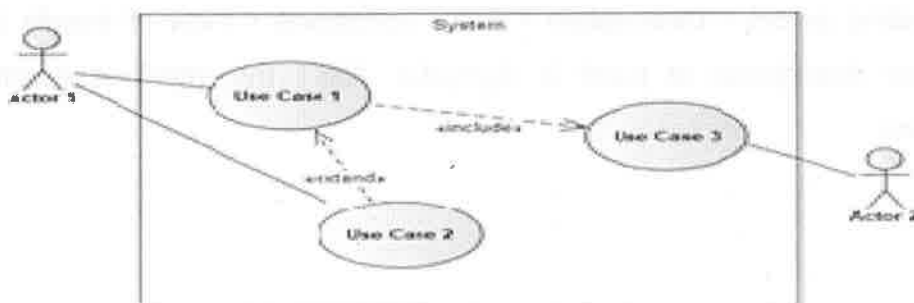
(4 Q x 4 M = 16 Marks)

1. What is software engineering? Discuss the characteristics of the software?
2. What does it mean for a process to be iterative and incremental? Give an example of a process model that is iterative
3. Define Scrum Sprint. What do you mean by product backlog in Scrum?
4. What are the subtle distinctions between the roles of a user, customer, and stakeholder?

Part B

(2 Q x 7 M = 14 Marks)

5. Recently, a new employee was hired by your company as a requirements engineer. She is to be involved in internal development projects and will help with the analysis phase. In your company the results of an analysis are documented in UML diagrams. Your new employee does not fully understand these yet, so your superior has asked you to support and coach her. Based on the following Use Case diagram, explain the basic characteristics of UML Use Case diagrams to her.



6. You work as a requirements engineer on a project to which a few years ago a forerunner project existed. During this earlier project the requirements were documented with high quality. Identify the suitable process model and describe the same in detail.

[OR]

7. A company wants to support its process of tender preparation with an information system. The management of the company hires a contractor to specify and develop such a system. For this project, you are the contractor's responsible requirements engineer. During the initial discussions with different representatives of the company you find, the following:

- a. Partly you do not understand the company's terminology.
- b. The company representatives do not use a consistent terminology and
- c. Unclear about the technology

Recommend a suitable process model for the above description and discuss the same.

Part C

(1 Q x 10 M = 10 Marks)

8. Create the use case diagram according to the following elevator control system.
- a. 1. The elevator control system shall allow the passenger to call the elevator and to select the destination floor; 2. When the passenger pushes the external button (to call the elevator), or the internal button (to select the destination floor), the central control system switches the button light on; 3. When the passenger calls the elevator or selects the destination floor, the central control system opens/closes the elevator door; 4. When the passenger calls the elevator or selects the destination floor, the central control system moves/stops the elevator to/at the passenger call floor or to/at the passenger destination floor. 5. When the passenger leaves the elevator, the central control system switches the button light off.
 - b. Describe the use case "Select Floor" by specifying:
 - Use case name
 - Participating actors
 - Description
 - Entry conditions
 - Flow of events (Hint: see use case description at point 3. consider JUST the interface events)
 - Exit conditions



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TEST 2 (Special Test)

Odd Semester: 2018-19

Course Code: CSE 216

Course Name: Software Engineering

Branch & Sem: CSE / 5

Date: 01 December 2018

Time: 1 Hour

Max Marks: 40

Weightage: 20%

Instructions:

- (i) *All Parts of the Question paper are compulsory to answer*

Part A

Answer all Questions. Each question carries **four** marks.

(4x4=16)

1. Differentiate between activity diagram and swimlane diagram.
2. What is a data flow diagram? Depict the data flow modeling notations.
3. Explain data-centered architectures and layered architectures with diagrams.
4. Explain and differentiate between the terms 'verification' and 'validation'.

Part B

Answer all Questions. **Each** question carries **six** marks.

(2x6=12)

5. Provide a real-world example of Web or Mobile application and explain how the application meets the following design principles: anticipation, communication, controlled autonomy, efficiency and learnability.
6. Assume that 10 errors have been introduced in the preliminary design model and that each error will be amplified by a factor of 2:1 into detailed design and an addition 20 design errors are introduced and then amplified 1.5:1 into code where an additional 30 errors are introduced. Assume further that all unit testing will find 30 percent of all errors, integration will find 30 percent of the remaining errors, and validation tests will find 50 percent of the remaining errors. No reviews are conducted. Draw a defect amplification model for this case. What is the total number of latent errors that will be generated?

Part C

Question carries **twelve** marks.

(1x12=12)

7a. Explain testing strategies of unit testing, integration testing, system testing and acceptance testing in detail. (8 marks)

7b. Differentiate between manual and automated testing. Provide scenarios for the usage of manual testing and automated testing. (4 marks)



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TEST 2

Odd Semester: 2018-19

Course Code: CSE 216

Course Name: Software Engineering

Branch & Sem: CSE & V Sem

Date: 28 November 18

Time: 1 Hour

Max Marks: 40

Weightage: 20%

Instructions:

- (i) Read the question properly and answer accordingly.
- (ii) Question paper consists of 3 parts.
- (iii) Scientific and Non-programmable calculators are permitted

Part A

Answer **all** the Questions. **Each** question carries **four** marks.

(4x4=16)

1. What makes software design different from coding? Briefly describe each of the four elements of the design model.
2. Explain the difference between verification and validation. Define the following testing strategies.
 - a. Regression testing
 - b. Smoke testing
3. Discuss the costs associated with software quality work? Considering each of the four aspects of the cost of quality, which do you think is the most expensive?
4. Assume that 15 errors have been introduced in the requirements model and each error will be amplified by 1:1.5 into design and an addition of 20 design errors are also introduced. Then in the next phase they are amplified in the ratio of 1:2 with an addition of 25 errors. Assume that unit testing will cover 30% of the errors, integration testing will find another 30 % of the remaining errors, and validation testing will find 50% of the remaining errors. No reviews are further conducted, how many errors are released to the field.

Part B

Answer **all** the Questions. **Each** question carries **seven** marks.

(2x7=14)

5. FitMan” is a fitness tracker application that tracks the number of steps walked, calories burnt, eating habits and sleeping pattern of users. The application further keeps a record of actual activity undertaken by the user against fitness goals. Design a suitable user interface for this application and explain how the user interface achieves the Interface Design Principles of anticipation, efficiency and communication.

[Hint- Draw the Screen layouts with the definition of major and minor menu items]

6. Illustrate any five Garvin’s quality factors with one or more electronics gadgets, with which you are familiar.

[OR]

What are the different verification techniques you know? Explain briefly.

Part C

Answer the Question. Question carries **ten** marks.

(1x10=10)

7. Draw an activity diagram for online shopping. Online customer can browse or search items, view specific item, add it to shopping cart, view and update shopping cart, checkout. User can view shopping cart at any time. Checkout is assumed to include user registration and login.

[OR]

8. Suppose you are given the following requirements for a simple database for the National Hockey League (NHL):
- the NHL has many teams,
 - each team has a name, a city, a coach, a captain, and a set of players,
 - each player belongs to only one team,
 - each player has a name, a position (such as left wing or goalie), a skill level, and a set of injury records,
 - a team captain is also a player,

 - a game is played between two teams (referred to as host team and guest team) and has a date (such as November 5th, 2017) and a score (such as 5 to 3).

Construct a concise ER diagram for the NHL database using the Chen/Grow foot notation. List your assumptions and clearly indicate the cardinality mappings as well as any role indicators in your ER diagram.



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END TERM FINAL EXAMINATION

Odd Semester: 2018-19

Course Code: CSE 216

Course Name: Software Engineering

Programme & Sem: CSE & V Sem

Date: 29 December 2018

Time: 2 Hours

Max Marks: 80

Weightage: 40%

Instructions:

- (i) Read the question properly and answer accordingly.
- (ii) Question paper consists of 3 parts.
- (iii) Scientific and Non-programmable calculators are permitted.

Part A

Answer **all** the Questions. **Each** question carries **five** marks.

(4Qx5M=20)

1. Define baseline. Assume you are the manager of a small project. What baselines would you define for the Project?
2. A software system has 870 modules. The latest release required that 70 of these modules to be changed. In addition, 35 new modules were added and 15 were removed. Compute the Software Maturity Index [SMI] for the system. [Hint use maintenance metrics]
3. A software team delivered a software increment to end users. The users uncovered eight defects during first month of use. Prior to delivery the software team found 158 errors during FTR and testing tasks. Calculate the Defect Removal Efficiency.
4. What is Software Configuration Management? Explain the process of Change Management.

Part B

Answer **all** the Questions. **Each** question carries **ten** marks.

(3Qx10M=30)

5. Let the expected size of a semidetached software project is 52.5 KLOC. Using the coefficients in the below table, and the Basic COCOMO estimates formulae calculate the following (Table 1)
 E - effort in person-months, D - development time in chronological months N - No of People.

Project class	ab	bb	cb	db
organic	2.4	1.05	2.5	0.38
semidetached	3.0	1.12	2.5	0.35
embedded	3.6	1.20	2.5	0.32

Table 1

6. Next Date is a function with three variables: month, day, year. It returns the date of the day after the input date. Limitation: years 1812-2012

Treatment Summary: if it is not the last day of the month, the next date function will simply increment the day value. At the end of a month, the next day is 1 and the month is incremented. At the end of the year, both the day and the month are reset to 1, and the year incremented. The Gregorian calendar adds a 29th day to February in all years evenly divisible by 4, except for centennial years (those ending in -00) which are not evenly divisible by 400.

Develop a set of test cases that you feel will adequately test the program [Use Black box testing techniques]

7. a. Briefly explain the two types of risk management strategies.
 b. The software project team has to develop 25 new components and assume the average LoC /component is 120. Compute the Risk Exposure when the cost/LoC is Rs. 16 and the risk probability is 70%.

Part C

Answer **both** the Questions. **Each** question carries **ten** marks. (2Qx15M=30)

8. Draw the Precedent network diagram for the given table 2 and calculate the estimated duration, Float and Activity span using Critical Path Method. Find the Critical Path also.

Activity	Duration (Weeks)	Predecessor(s)
A	8	-
B	4	A
C	6	A

D	3	B
E	5	C,D
F	2	C,D
G	4	E
H	5	F,G

Table 2

9. Derive a Control Flow Graph [CFG] for the given function and apply Basis Path Testing to identify independent paths & develop test cases which will guarantee that all statements and branches are covered.

```

Class BinSearch {
public static void search(int key, int[] elemArray, Result r) {
int bottom = 0;
int top = elemArray.length - 1;
int mid; r.found = false;
r.index=-1;
while (bottom <= top) {
mid = (top + bottom)/2;
if (elemArray (mid) == key) {
r.index = mid;
r.found = true; return;}
else {
if (elemArray[mid] < key)
bottom = mid +1;
else top = mid - 1;
}
}
}
}
}

```

