



ID NO.	
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PRESIDENCY UNIVERSITY, BENGALURU
SCHOOL OF ENGINEERING

Weightage: 40 %

Max Marks: 80

Max Time: 2 hrs.

09 May 2018 Wednesday

ENDTERM FINAL EXAMINATION MAY 2018

Even Semester 2017-18 Course: **CSE 216 Software Engineering**

IV Sem. CSE

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

(4 Q x 5 M = 20 Marks)

1. Distinguish between Verification and Validation. Why is highly coupled module more difficult to unit test?
2. Write down the steps involved in project estimation method.
3. A student is requested to fill in an application form containing his/her personal details, and the desired course. The university checks whether the course is available or not. If the course is available and the student is enrolled for the course, the university confirms the enrolment by sending a confirmation letter for the registered course to the student. If the course is unavailable, a rejection letter will be sent to a student. From the above description identify the External Entities (EE), Processes (P), Data Flows (DF) and Data Stores (DS).
4. The software project team has to develop 20 new components and assume the average LoC /component is 150. Compute the Risk Exposure when the cost/LoC is Rs. 16 and the risk probability is 60%.

Part B

(3 Q x 10 M = 30 Marks)

5. You are requested to develop an online voting system, which will allow the voters to cast their votes in a more convenient way. Keeping in mind the traditional voting method, identify the functional requirements for the online voting system.
6. Let the expected size of a semidetached software project is 42.5 KLOC. Using the coefficients in the below table, and the Basic COCOMO estimates formulae calculate the following
 E - effort in person-months, D - development time in chronological months N - No of People.

Project class	a_b	b_b	c_b	d_b
<i>organic</i>	2.4	1.05	2.5	0.38
<i>semidetached</i>	3.0	1.12	2.5	0.35
<i>embedded</i>	3.6	1.20	2.5	0.32

7. A program reads three integer values; they are interpreted as representing three lengths of the sides of the triangle. The program prints the message stating that whether the triangle is scalene, isosceles or equilateral. Develop a set of test cases that you feel will adequately test the program [Use Black box testing techniques--]

Part C

(2Q x 15 M = 30 Marks)

8. 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;
}
}
}
}
}
}

```

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

Activity	Duration	Precedent
A	5	
B	7	A
C	2	A
D	12	B
E	20	B
F	4	C
G	11	C
H	8	D
I	6	E
J	3	E
K	9	F
L	1	H
M	14	J
N	19	G,I,K,L,M



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Max Marks: 40

Max Time: 1 hr.

27 March Tuesday 2018

TEST – 2

SET A

Even Semester 2017-18 Course: **CSE216 SOFTWARE ENGINEERING** VI Sem. CSE

Instruction:

- (i) Read the question properly and answer accordingly.
 - (ii) Question paper consists of 2 parts.
 - (iii) Scientific and Non-programmable calculators are permitted
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Part A

(4 Q x 4 M = 16 Marks)

1. Define Cohesion and Coupling. Explain any two categories of Coupling.
2. Describe 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?
3. Assume that 10 errors have been introduced in the requirements model and each error will be amplified by 1:2 into design and an addition of 20 design errors are also introduced. Then in the next phase they are amplified in the ratio of 1:1.5 with an addition of 30 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 releases to the field.
4. Can a program be correct and still not be reliable? Explain.

Part B

[2QX12= 24 Marks]

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

Function `fn_delete_element` (int value, int array_size, int array[])

```
{    int i;
    location = array_size + 1;
    for i = 1 to array_size
        if ( array[i] == value )
            location = i;
        end if;
    end for;
    for i = location to array_size
        array[i] = array[i+1];
    end for;
    array_size --;
}
```

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. Finally, the problem of leap year makes determining the last day of a month interesting.

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. Thus 1600, 2000 and 2400 are leap years but 1700, 1800, 1900, 2100, 2200 and 2300 are not.

The year 1900 falls in the 1812-2012 period.



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22 Feb Thursday 2018

TEST – 1

Even Semester 2017-18 Course: **CSE216 SOFTWARE ENGINEERING**

VI 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. Is software engineering applicable when WebApps are built? Discuss the unique characteristics of webApps.
3. Is it possible to begin coding immediately after an analysis model has been created? Explain your answer and then argue the counterpart.
4. Why do requirements change so much? After all, people don't know what they want?

Part B

(1Qx 10 M = 10 Marks)

5. Consider a grocery supermarket planning to computerize their inventory management. The items on shelves will be marked with Radio Frequency Identification (RFID) tags and a set of RFID reader-devices will be installed for monitoring the movements of the tagged items. Each tag carries a 96-bit EPC (Electronic Product Code) with a Global Trade Identification number, which is an international standard. The RFID readers are installed on each shelf on the sales floor. The RFID system consists of two types of components (1) RFID tag or transponder, and (2) RFID reader or transceiver. RFID tags are passive (no power source), and use the power induced by the magnetic field of the RFID reader. An RFID reader consists of an antenna, transceiver and decoder, which sends periodic signals to inquire about any tag in vicinity. On receiving any signal from a tag it passes on that information to the data processor. You are tasked to develop a

software system for inventory management. The envisioned system will detect which items will soon be depleted from the shelves, as well as when shelves run out of stock and notify the store management. The manager will be able to assign a store associate to replenish the shelf, and the manager will be notified when the task is completed. Based on the initial ideas for the desired functions of the software system, derive the functional requirements and discuss if any assumptions would you like to have?

Part C

(1Q x 14M = 14 Marks)

6. You are hired to develop a software system for motion detection and garage door control. The system should turn the garage door lights on automatically when it detects motion within a given perimeter. The garage door opener should be possible to control either by a remote radio transmitter or by a manual button switch. The opener should include the following safety feature. An “electric eye” sensor, which projects invisible infrared light beams, should be used to detect if someone or something passes under the garage door while it closes. If the beam is obstructed while the door is going down, the door should not close—the system should automatically stop and reverse the door movement. The relevant hardware parts of the system are as follows
- ✓ motion detector
 - ✓ external light bulb
 - ✓ motor for moving the garage door
 - ✓ “electric eye” sensor
 - ✓ remote control radio transmitter and receiver
 - ✓ manual opener button switch Electric

Assume that all the hardware components are available and you only need to develop a software system that controls the hardware components.

- (a) Identify the actors for the system and their goals. [3 Marks]
- (b) Draw the use case diagram for the system [3 Marks]
- (c) For the use case that deals with the remote-controlled garage door opening, write a fully organized description. [4 Marks]
- (d) Draw the system sequence diagram(s) for the use case selected in (c). [4 Marks]