# AUTUMN END SEMESTER EXAMINATION-2016

5th Semester B.Tech & B.Tech Dual Degree

## SOFTWARE ENGINEERING

## IT-3003

(Regular-2014 & Back-2013 Admitted Batch)

**Time: 3 Hours**          **Full Marks: 60**

*Answer any Six questions including question No.1 which is compulsory.*
*The figures in the margin indicate full marks.*
*Candidates are required to give their answers in their own words as far as practicable*
*and <u>all parts of a question should be answered at one place only</u>.*

1.     Answer all parts of the following question.      [2 × 10

(a) Which life cycle model would you follow for developing software for the following application:

*A software that would function as the controller of a telephone switching system.*

Give the justification for your answer.

(b) Name the activities those are performed in project planning.

(c) What do you mean by a person-month?

(d) What is a critical path in an activity network?

(e) What is the purpose of requirements analysis activity?

(f) What do you mean by balancing a DFD?

(g) What do you mean by beta testing?

(h) Explain how cyclomatic complexity is computed.

(i) What do you mean by adaptive maintenance? Briefly explain with an example.

(j) What do you mean by a POFOD of 0.001?

2. (a) How do cohesion and coupling affects software design?      [4
Discuss about various types of cohesion and coupling.

(1)

(b) Explain the working of RAD model. What are its [4
applicability?

3. (a) What is function point metric? What are the steps for [4
calculating function point metric? Compute the function point
value for a project with the following information domain
characteristics.

Number of user inputs=24

Number of user outputs=16

Number of inquiries=22

Number of files=4

Number of external interfaces=2

Assume, the complexity weighting factor is average and the
various complexity weighting factors are 4, 2, 0, 4, 3, 4, 5,
3, 5, 5, 4, 3, 5, 5.

(b) With a suitable example, briefly explain project estimation [4
using COCOMO.

4. (a) Identify the functional requirements for the following software. [4
List out the input, output and constraints for each function.

Supermarket Automation Software (SAS): The manager of a
supermarket wants us to develop an automation software.
The supermarket stocks a set of items. Customers pick up
their desired items from the different counters in required
quantities. The customers present these items to the sales
clerk. The sales clerk passes the items over a bar code reader
and an automatic weighing scale. The data regarding the item
type and the quantity get registered.

• SAS should at the end of a sales transaction print the bill
containing the serial number of the sales transaction, the name
of the item, code number, quantity, unit price, and item price.
The bill should indicate the total amount payable.

• SAS should maintain the inventory of the various items of

(2)

the supermarket. The manager upon query should be able to see the inventory details. In order to support inventory management, the inventory of an item should be decreased whenever an item is sold. SAS should also support an option by which an employee can update the inventory when new supply arrives.

- SAS should support printing the sales statistics for every item the supermarket deals with for any particular day or any particular period. The sales statistics should indicate the quantity of an item sold, the price realized, and the profit.

- The manager of the supermarket should be able to change the price at which an item is sold as the prices of the different items vary on a day-to-day basis.

(b) Draw the Context diagram and Level 1 Data Flow Diagram [4 (DFD) for the above Supermarket Automation Software (SAS) given in Part (a).

5. (a) Design black box test suites for a function called find- [4 intersection. The function find-intersection takes four real numbers $m_1, c_1, m_2, c_2$ as its arguments representing two straight lines $y=m_1x+c_1$ and $y=m_2x+c_2$. It determines the points of intersection of the two lines. Depending on the input values to the function, it displays any one of the following messages:

- Single point intersection
- Overlapping lines-infinite points of intersection
- Parallel lines-no points of intersection
- Invalid input values

(b) What do you mean by integration testing? Briefly explain the [4 different types of integration testing techniques along with their advantages and disadvantages.

6. (a) Briefly explain about various types of code review techniques [4 along with their advantages and disadvantages.

(3) .

(b) Consider the following program segment. [4

```
main()
{
int number, index;
printf("Enter a number:");
scanf("%d",&number);
index=2;
while(index<=number-1)
{
if(number%index==0)
{
printf("Not a prime number");
break;
}
index++;
}
if(index==number)
printf("Prime number");
}
```

- Draw the control flow graph for the above program segment.
- Find the cyclomatic complexity.
- Design the test cases.

7. (a) With suitable examples, briefly explain the various reliability [4
metrics of software products?

(b) What do you mean by software re-engineering? With a suitable [4
diagram, briefly explain the process of software reengineering
along with its advantages and disadvantages.

8. Write short notes on any TWO of the followings. [4 × 2

(a) Prototyping model
(b) Risk mitigation
(c) UML Diagrams
(d) System testing
(e) Level-3 of SEI-CMM

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