**53 (IT 605) SWEN**

**2018**

# SOFTWARE ENGINEERING

Paper : IT 605

*Full Marks : 100*

Time : Three hours

***The figures in the margin indicate full marks for the questions.***

*Answer **any five** questions.*

1. *(a)* What is the principal aim of the Software Engineering discipline ? What does the discipline of software engineering discuss ? 5+5=10

   *(b)* What are the symptoms of the present software crisis ? What factors have contributed to the making of the present software crisis ? What are possible solutions to the present software crisis ? 3+3+4=10

2. *(a)* Why is it important to adhere to a life cycle model of software development ? 6

(b) Describe Evolutionary life cycle model along with its merits and demerits. 4+4=8

(c) A data entry system is to be designed for office staff who have never used computers before, which life cycle model would you propose ? Why ? 6

3. A private corporation is an order by post service dealing with computer books. It receives order from librarians / individuals the orders for appropriate publishers are clubbed together and books are brought from the publisher at a discount price. The books received are linked to the request ; an invoice is generated and sent to the requester with the books requested. The operations are to be automated specially the invoicing and reconciliation process.

(a) Draw Data Flow Diagram (context diagram and first level factoring). 3+5=8

(b) Write data dictionary entries for a data flow and data store. 2+2=4

(c) Arrive a structure chart for 3(a). 8

4. *(a)* List the *five* desirable characteristics of a good Software Requirement Specification (SRS) documents. Who are the different categories of users of the SRS document ? Why is the SRS document also known as the black box specification of a system ?

5+5+4=14

*(b)* What do you understand by traceability of requirements ? Why is traceability important ? 3+3=6

5. Suppose a software project consists of flowing activities : 10+10=20

| Activity | Effort in months |
|---|---|
| T1 | 1 |
| T2 | 2 |
| T3 | 2 |
| T4 | 5 |
| T5 | 3 |
| T6 | 1 |
| T7 | 6 |

The following precedence relation is known to hold among different tasks :

$T1 \leq T2 \leq \{T3, T4, T5, T6\} \leq T7$ where $T_i \leq \{T_j, T_k\}$ means. $T_i$ must complete before $T_j$ or $T_k$ start.

Draw the Activity network and Gantt chart representation for the project.

6. Consider the following program which takes in three integer value and determines their maximum :

```
in find-max (int a, int b)
  { if (a>b)
      if (a > c) max =a ;
      else max = c ;
  else if ( b > c) max = b ;
      else max = c ;
    return max ;
    }
```

*(i)* Draw a control flow graph 5

*(ii)* Determine cyclomatic complexity and possible linearly independent paths. 5+5=10

*(iii)* Prepare test cases. 5

7. Write short notes on the following : ***(any four)*** 4×5=20

*(a)* Software Maintenance

*(b)* System Testing

*(c)* Black-box testing and White-box testing

*(d)* Top-down and Bottom-up integration testing

*(e)* McCabe's Cyclomatic Complexity metrics.

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