Course Code : CST 315 **KOLP/RW – 19 / 9108**

Fifth Semester B. E. (Computer Science and Engineering) Examination

SOFTWARE ENGINEERING

Time : 3 Hours] [Max. Marks : 60

Instructions to Candidates :—

(1) All questions carry marks as indicated against them.
(2) Due credit will be given to neatness and adequate dimensions.
(3) Assume suitable data and illustrate answers with neat sketches wherever necessary.

1. (a) Explain all the phases of Extreme Programming model which is an agile model development approach. 6(CO1)

   (b) What is software ? Describe software characteristics in detail. 4(CO1)

OR

2. (a) Describe spiral model in detail. Suppose travel agency needs software for automating its bookkeeping activities. The set of activities to be automated are rather simple and are at present being carried out manually. The travel agency has indicated that it is unsure about the type of user interface which would be suitable for its employees and its customers. Extend your description to express that would it be proper for a development team to use the spiral model for developing this software. 6(CO1)

   (b) Explain software process framework which establishes the foundation for a complete software process by identifying a small number of framework activities. 4(CO1)

3. Attempt any **Two** of the following :

   (a) Discuss Quality Function Deployment technique of requirement elicitation. Outline what information is produced as a consequence of requirements gathering. 5(CO2)

   (b) List and explain the design modeling principles that represents the characteristics of the software. 5(CO2)

(c) Explain system engineering hierarchy. Consider an Online Questionnaire System, where a questionnaire is used to collect information from respondents who complete it. It is a tool for market research, products evaluation, satisfaction surveys and for many other areas. It is a creative research systems offers software for online surveys, live online reports and full service web survey hosting. The modules allow signing up, setting the account and filling out a questionnaire, to manage on the questionnaire and collect data, etc. Define the set of domains that describe all the four views of the system engineering hierarchy considering detailed components of the individual system elements. 5(CO2)

4. (a) Explain the following design concepts (any **Three**) :

(i) Modularity.

(ii) Functional independence.

(iii) Refactoring.

(iv) Refinement. 5(CO2)

Attempt any **One** out of **(b)** and **(c)** :

(b) Develop a system that will help with planning large scale events and parties such as weddings, graduation celebrations, birthday parties, etc. Using an activity diagram, model the process context for such a system that shows the activities involved in planning a party (booking a venue, organizing invitations, etc.) and the system elements that may be used at each stage. 5(CO2)

OR

(c) Design a class diagram for library management system. Describe the structure of a system by showing the suitable system classes, attributes, methods, associations, etc. between classes. For drawing consider various points such as books, authors, librarian, transactions, records and payments etc. 5(CO2)

5. (a) Prepare a flowgraph and find cyclomatic complexity using all three methods for code below. List all independent paths.

```
int BinSearch (char*item, char*table [], int n)
{
int bot = 0, top = n–1, mid, cmp;
while (bot <= top)
{
mid = (bot+top)/2;
if(table [mid]== item)
return mid ;
else if (compare (table [mid], item) < 0)
top = mid – 1;
else bot = mid + 1;
}
return – 1; / / not found
}
```

4(CO3)

(b) Conclude your understanding to explain the steps for top–down integration testing and bottom up integration testing with example. 6(CO3)

OR

(c) (i) How can you develop test cases by using the black–box testing method using equivalence partitioning ?

(ii) Explain loop testing which is used to validate different classes of loop constructs. 3+3(CO3)

6. (a) Discuss the function point metric proposed by Albrecht. A system has 14 external input, 26 external outputs, and fields 33 different external queries, manages 8 internal logical files and interfaces with 6 different legacy systems. All of these data are of average complexity and $\Sigma Fi=50$. Compute FP for the system. 4(CO4)

Attempt any **Two** out of **(b)**, **(c)** and **(d)** :

(b) Justify the following statement in detail: "Defect Removal Efficiency is the measure of quality assurance and control activities". 3(CO4)

(c) Explain the Halstead metrics for Source code. 3(CO4)

(d) What are the product metrics ? Differentiate between measure, metrics and indicators. 3(CO4)

7. Attempt any **Two** of the following :

(a) What is a Formal Technical Review ? Discuss Review Guidelines for conducting Formal Technical Review. 5(CO4)

(b) List and explain the roles that are implemented by a SCM repository giving a view on its features and contents. 5(CO4)

(c) Explain software reengineering model with diagram. 5(CO4)