Reg. No.

Sixth Semester B.E. Degree Examination, August 2001

Computer Science Engineering
Software Engineering

Time: 3 hrs.] [Max.Marks : 100

Note: *Answer any FIVE full questions.*

1. (a) What is Software Engineering? How is it different from other traditional Engineering branches? **(5 Marks)**

   (b) What are the objectives of software engineering? **(5 Marks)**

   (c) What is a process model? Describe the following process models with their relative merits & demerits
   i) Waterfall model ii) Evolutionary development **(10 Marks)**

2. (a) Explain the following terms
   i) Ethnography ii)Data Dictionary
   iii) COTS iv) Stakeholder **(5 Marks)**

   (b) How to organize the requirements document so that it is easily maintainable. **(5 Marks)**

   (c) What is software prototyping? Explain Throwaway & Evolutionary prototyping techniques. **(10 Marks)**

3. (a) Explain four significant attributes every software product should possess. **(5 Marks)**

   (b) What is the need for validating requirements? Explain any two requirements validation techniques. **(10 Marks)**

   (c) Differentiate between the following terms.
   i) Milestone & Delivarable
   ii) Requirements definition & Requirements Specification. **(5 Marks)**

4. (a) Differentiate between function oriented and object oriented design strategies with a specific example. **(10 Marks)**

   (b) Draw a DFD for the following applications.
   A salary system which computes employee salaries per week & deductions. Input to the system is a worksheet containing empid, name, number of hours worked, number of overtime hours worked etc. System maintains tables holding tax rates & pay rate for various employee classes. The out put is cheque to the employee **(6 Marks)**

   (c) Why is it important to use different notations to describe software design? **(4 Marks)**

5. (a) Why is software project management difficult? What are the responsibilites of a software project manager? **(6 Marks)**

Contd.... 2

(b) Explain why maximizing cohesion & minimizing coupling leads to more maintainable systems? What other design attributes influence system maintainability (10 Marks)

(c) Why is interface testing necessary given that individual program units are extensively validated (4 Marks)

6. (a) What is CASE? With a neat diagram explain CASE system Life cycle. (10 Marks)

(b) What are the principles to be followed while designing user interface? (5 Marks)

(c) distinguish between informal (democratic) team structure and Chief programmer team structure. (5 Marks)

7 (a) What is software reliability?explain the reliability metrices (8 Marks)

(b) What is meant by structural testing? For the following 'C' routine derive test cases for structural testing. Also write the cyclomatic complexity of this routine. (12 Marks)

```
Void binary search(int key, int T[], int size, int *found)
{ int top, bott, mid;
top = 0;
bott = size -1;
*found = 0;
While (top<=bottom)
   { mid = (top + bott)/2;
    if (t[mid]==key)
      { *found = 1;
      exit;
        }
    if(t[mid]<key)
     bott = mid -1;
    else
      top = mid + 1;
  } / * end while * /
  } / * end search * /
```

8. (a) Briefly explain how algorithmic cost modelcan be used for estimating software cost. (10 Marks)

(b) What are the characteristics of clean room software development? (5 Marks)

(c) What is SEI process maturity model? (5 Marks)

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A/2

CS/IS6T2

Reg. No. | | | | | | | | | | |

Sixth Semester B.E. Degree Examination, February 2002

Computer Science and Information Science Engineering

Software Engineering

2

Time: 3 hrs.] [Max.Marks : 100

Note: *Answer any FIVE full questions.*

1. (a) Distinguish between software product and software process. (5 Marks)
   (b) Explain the waterfall model of software process. (8 Marks)
   (c) Why is the waterfall model not an accurate reflection of software development activities. (7 Marks)

2. (a) What do you understand by system architecture of software structure? (5 Marks)
   (b) Why is it necessary to produce on overall description of system architecture at an early stage of the system specification process? (7 Marks)
   (c) Distinguish between 'throw-away prototyping' and 'evolutionary prototyping' with suitable examples. (8 Marks)

3. (a) Explain clearly the functioning of system requirement specification emphasising the distinction between requirement definition and requirement specification. (7 Marks)
   (b) Explain why it is very difficult to produce a complete and consistent set of requirements. (6 Marks)
   (c) Explain how view-point oriented analysis and method-based analysis help to discover the requirements of end user and organization. (7 Marks)

4. (a) Explain clearly the distinction between high level design and detailed design. (8 Marks)
   (b) What do you understand by 'Modular decomposition' in software design? Explain the two models, namely the object model and the data-flow model with suitable examples. (12 Marks)

5. (a) Write a data flow diagram for an ATM banking system to cater to the usual transactions of money withdrawal deposit, transfer and query. (8 Marks)
   (b) Explain the user-interface design principles. (6 Marks)
   (c) What are the merits and drawbacks of a command line interface? (6 Marks)

6. (a) Explain the meaning of reliability metrics and discuss any two metrics in detail that help in the assessment of system performance. (8 Marks)
   (b) How do verification and validation differ? (6 Marks)
   (c) Explain defensive programming, structural testing and interface testing. (6 Marks)

7. (a) What are the different activities in project management? (8 Marks)
   (b) Explain in detail the COCOMO model highlighting the approach to estimate person-months and development time of software projects. (12 Marks)

8. Write a short notes on the following:
   i) Data dictionary
   ii) Object oriented design
   iii) Static verification
   iv) Product Quality Metrics. (20 Marks)

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CS/IS6T2

Reg. No. | | | | | | | | | |

Sixth Semester B.E. Degree Examination, July/August 2002

Computer Science and Information Science Engineering

Software Engineering

Time: 3 hrs.] [Max.Marks : 100

1. (a) Define software Engineering. What are the characteristics of software process? (10 Marks)
   (b) List the merits and demerits of different software process models. (10 Marks)

2. (a) What are process activities required for requirement analysis process? (5 Marks)
   (b) Explain the role of object models as used in requirement Analysis. (5 Marks)
   (c) Explain the method based analysis approach of requirement analysis. (10 Marks)

3. (a) What is software prototyping? Explain throw away prototyping technique. (6 Marks)
   (b) Briefly explain the activities involved in design process. (5 Marks)
   (c) Explain the following with an example.
      a) Coupling
      b) Cohesion (6 Marks)

4. (a) Write a dataflow diagram for a library. (10 Marks)
   (b) Explain how data dictionaries may be used to supplement design information in data flow diagrams and structure charts. (10 Marks)

5. (a) Explain the working principle of command line interfaces. (8 Marks)
   (b) Explain the fault tolerance stratergy used for reliability in software systems. (6 Marks)
   (c) Explain the advantages and disadvantages of reusing software components. (6 Marks)

6. (a) Define Testing. Explain the stages in the testing process. (6 Marks)
   (b) Explain the following methods of testing.
      a) Top-down testing.
      b) Thread testing. (8 Marks)
   (c) Discuss the difference between black-box testing and structural testing. (6 Marks)

7. (a) What is CASE? Explain the CASE system life cycle with a neat diagram. (10 Marks)
   (b) Bring out the salient features of COCOMO model. (5 Marks)
   (c) Briefly explain the features of SEI process maturity model. (5 Marks)

8. Write short notes on: (4×5=20 Marks)
   a) Project planning.
   b) Project staffing.
   c) Object oriented design.
   d) Exception handling.

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Reg. No.

Sixth Semester B.E. Degree Examination, January/February 2003

Computer Science and Information Science Engineering

Software Engineering

Time: 3 hrs.] [Max.Marks : 100

Note: *Answer any FIVE full questions.*
All questions carry equal marks.

1. (a) What is Software Engineering process? Explain the Waterfall model and Spiral model. (6 Marks)

   (b) Describe the difference between "Known Risks" and "Pridictable Risks". (4 Marks)

   (c) Discuss in detail the various steps of Requirements Engineering. (10 Marks)

2. (a) "Software requirement analysis is the most communication intensive step in the Software Process". Why does the communication path frequently break down? (4 Marks)

   (b) "Safe Home" a microprocessor-based Home Security system that would protect against and/or recognize a variety of undesirable "situations" such as illegal entry, fire, flooding and others. The product uses sensors to detect the situation, can be programmed by the home owner, and will automatically telephone a monitoring agency when a situation is detected.

   Analyze the information domain for safehome. Represent information flow in the system, information content, and any information structure that is relevant. (10 Marks)

   (c) Discuss software prototyping. (6 Marks)

3. (a) What makes the software design different from coding? (4 Marks)

   (b) A number of high-level programming languages support the internal procedure as a modular construct. How does this construct affect coupling? information hiding? (6 Marks)

   (c) Discuss how structural partitioning can help to make software more maintainable. (6 Marks)

   (d) Write a context level DFD for the "Safe Home" in question 2b. (4 Marks)

4. (a) Using the architecture of a house or building as a metaphor, draw comparisons with software architecture. How are the disciplines of classical architecture and the software architecture similar? How do they differ? (8 Marks)

   (b) Consider a typical graphical user interface. Define a set of classes for the interface entities that typically appear in the GUI. The appropriate attributes and methods need to be defined. (6 Marks)

   (c) How do object oriented design and structured design differ? What aspects of these two design methods are the same. (6 Marks)

Contd.... 2

5. (a) Suggest six reasons why software reliability is important. Using an example, explain the difficulties of describing what software reliability means. (8 Marks)

(b) Suggest appropriate reliability metrics for the following classes of software system. Give reasons for your choice of metric. Make some predictions about the usage of these systems and suggest appropriate values for the reliability metric.

i) a system which monitors patients in a hospital intensive care unit.

ii) a word processor

iii) an automated vending machine control system

iv) a system to control breaking in a car

v) a system to control refrigeration unit

vi) a management report generator. (12 Marks)

6. (a) Discuss the difference between verification and validation and explain why validation is a particularly difficult process. (5 Marks)

(b) Discuss the difference between black-box testing and structural testing and suggest how they can be used together in the defect testing process. (7 Marks)

(c) Explain why interface testing is necessary given that individual units have been extensively validated through unit testing and program inspections. (4 Marks)

(d) Discuss the stages involved in static analysis of a program. (4 Marks)

7. (a) Explain why the process of project planning is an iterative one and why a plan must be continually reviewed during a software project. (5 Marks)

(b) Explain why keeping all members of a group informed about progress and technical decision in a project can improve group cohesiveness. (5 Marks)

(c) Explain the COCOMO for software cost estimation. (5 Marks)

(d) Discuss the program quality metrics. (5 Marks)

8. Write short notes on :

a) CASE tools

b) Software Quality Assurance

c) Graphical User Interface

d) The SEI Process Maturity Model. (5×4=20 Marks)

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51/C

CS/IS612

USN | | | | | | | | | | |

Sixth Semester B.E. Degree Examination, July/August 2003

Computer Science / Information Science and Engineering

Software Engineering

5

Time: 3 hrs.] [Max.Marks : 100

Note: *Answer any FIVE full questions.*

1. (a) Describe any three software product attributes and any three software process attributes. (6 Marks)

   (b) Describe the system evolution and system decommissioning phases of the system engineering process. (6 Marks)

   (c) Briefly discuss the desirable characteristics and structure of a requirements document. (8 Marks)

2. (a) With an example, explain the use of viewpoint template and service template in the VORD method. (6 Marks)

   (b) What is a data dictionary? Discuss its structure and uses. (6 Marks)

   (c) Discuss the use of structured natural language for the specification of requirements. (8 Marks)

3. (a) Describe any two techniques for developing software prototypes. (6 Marks)

   (b) Explain the concepts of cohesion coupling and adaptability. (8 Marks)

   (c) With an example describe the repository model and discuss its advantages and disadvantages. (6 Marks)

4. (a) Describe the characteristics of an object oriented design, its advantages and explain the typical activities performed during the object oriented design process. (8 Marks)

   (b) With an example, describe the three process steps for transforming a data flow diagram to a structure chart. (12 Marks)

5. (a) What documents are to be generally delivered alongwith a software system? (6 Marks)

   (b) Describe any three software reliability metrics and discuss their applications. (6 Marks)

   (c) Describe the two popular approaches for providing software fault tolerance. (8 Marks)

6. (a) What are the advantages and problems of developing software with reusable components? (8 Marks)

   (b) Briefly describe the different stages in the testing process. (6 Marks)

   (c) What are the different types of interface errors that can occur and what are the general guidelines for interface testing? (6 Marks)

Contd.... 2

7. (a) Explain the technique of program inspections. (6 Marks)

(b) List the sections typically included in a project plan. (4 Marks)

(c) Describe the factors which affect communication in a group. (6 Marks)

(d) Describe any two program quality metrics. (4 Marks)

8. (a) Discuss the techniques for estimating project duration and determining the staffing pattern. (8 Marks)

(b) Describe the five levels defined in the SEI process maturity model. (6 Marks)

(c) Describe the functional classification of CASE tools. (6 Marks)

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CS/IS6T2

USN

Sixth Semester B.E. Degree Examination, January/February 2004

Computer Science and Information Science Engineering

Software Engineering

Time: 3 hrs.] [Max.Marks:100

Note: *Answer any FIVE full questions.*

1. (a) Briefly explain the software process characteristics. (7 Marks)
   (b) Describe the professional responsibilities of a software engineer. (5 Marks)
   (c) Explain the activities involved in the system design process. (8 Marks)

2. (a) What is requirement engineering ? Explain the principal activities of requirement engineering process. (8 Marks)
   (b) Explain the method based analysis for requirements analysis. (6 Marks)
   (c) What is non-functional requirements ? Explain the different types of non-functional requirements. (6 Marks)

3. (a) Describe the evolutionary prototyping of software process. (6 Marks)
   (b) How the understandability and adaptability enhance the quality of software design ? (6 Marks)
   (c) What features make client - server model attractive for system structuring ? (8 Marks)

4. (a) Write the features and advantages of menus for user interface design. (8 Marks)
   (b) How structured programming could be used to avoid faults in software process. (8 Marks)
   (c) Define POFOD and MTTF of software reliability metrics. (4 Marks)

5. (a) Describe the merits of software development with reuse. (8 Marks)
   (b) Mention different testing strategies of software. Explain any one of them. (7 Marks)
   (c) Explain the characteristics of clean room software development. (5 Marks)

6. (a) In the development of large, embedded real time systems, suggest five factors which are likely to have a significant effect on the productivity of the software development team. (10 Marks)
   (b) Explain the factors influencing the staff selection for a software project. (10 Marks)

7. (a) Explain the criteria used for software pricing. (7 Marks)
   (b) How the software standards assure software quality ? (6 Marks)
   (c) Describe the features considered for measuring program quality metrics. (7 Marks)

8. (a) Describe, with a block diagram SEI process maturity model. (10 Marks)
   (b) Explain the process of project planning. (10 Marks)

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CS/IS6T2

USN | | | | | | | | | | |

Sixth Semester B.E. Degree Examination, July/August 2004

Computer Science and Information Science Engineering

Software Engineering

Time: 3 hrs.] [Max. Marks : 100

Note: *1. Answer any FIVE full questions.*
2. All questions carry equal marks.

1. (a) Distinguish between a software product and a software process. **(6 Marks)**
   (b) Explain different process models along with their relative merits and demerits. **(14 Marks)**

2. (a) Describe system architecture modeling with the help of a neat diagram. **(6 Marks)**
   (b) What are the differences between requirements definition and requirements specification. **(6 Marks)**
   (c) Give a brief description of software prototyping and briefly discuss the various prototyping techniques. **(8 Marks)**

3. (a) Explain different software design startegies with proper illustrations. **(8 Marks)**
   (b) Explain the dynamic nature of software system using state machine model. **(8 Marks)**
   (c) Write a brief note on data - flow design principle. **(4 Marks)**

4. (a) Explain clearly the distinction between high level design and detailed design. **(8 Marks)**
   (b) Describe user interface design principles. **(6 Marks)**
   (c) What are the differences between coupling and cohesion. **(6 Marks)**

5. (a) Briefly discuss the various software reliability metrics. **(8 Marks)**
   (b) Bring out the differences between verification and validation. **(6 Marks)**
   (c) Explain the stages of testing process. **(6 Marks)**

6. (a) Distinguish between alpha and beta testing. **(6 Marks)**
   (b) Explain the advantages and disadvantages of reusing the software components. **(6 Marks)**
   (c) Briefly describe the following
      a) Defensive programming
      b) Clean room software development **(2×4=8 Marks)**

7. (a) Explain the importance of project staffing. **(4 Marks)**
   (b) What is COCOMO model ? Describe its apprroach to estimate person months. **(8 Marks)**
   (c) List and explain, briefly, the different types of documentation. **(8 Marks)**

8. Write short notes on :
   a) Data dictionary
   b) CASE tools
   c) Software quality assurance
   d) SEI capability maturity model **(4×5=20 Marks)**

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8 CS/IS6T2

USN

Sixth Semester B.E. Degree Examination, January/February 2005

Computer Science/Information Science Engineering

Software Engineering

Time: 3 hrs.] Max.Marks : 100

Note: *1. Answer any FIVE full questions.*
2. All questions carry equal marks.

1. (a) What is software engineering ? Explain the various process characteristics. (6 Marks)

   (b) With the help of a diagram explain Boehm's spiral model of the software process. What are its advantages over water fall method? (8 Marks)

   (c) Describe five different types of functional components that might be part of large - scale software system (6 Marks)

2. (a) What is requirement definition and specification ? With the help of a diagram explain the requirement engineering process. (6 Marks)

   (b) A software system is to be developed to automate a library catalogue. This system will contain information about all the books in a library and will be usable by library staff and by book borrowers and readers. The system should support catalogue browsing, querying, and should provide facilities allowing users to send messages to library staff reserving a book that is on loan. Identify the principal viewpoints which might be taken into account in the specification of this system. Show their relationships using a view point hierarchy diagram. (8 Marks)

   (c) Develop an object model including a class hierarchy diagram and an aggregation diagram showing the principal components of a personal computer system and its system software. (6 Marks)

3. (a) Describe three different types of non-functional requirements which may be placed on a system. Give examples of each of these different types of requirement. (6 Marks)

   (b) Explain why, for large system development, it is recommended that prototypes should be "throw-away" prototypes. (8 Marks)

   (c) Explain why it is important to use different notations to describe software design. (6 Marks)

4. (a) Explain why maximizing cohesion and minimizing coupling leads to more maintainable systems. What other attributes of a design might influence system maintainbility ? (6 Marks)

   (b) What is system structuring ? Explain different models in system structuring (8 Marks)

   (c) Design an architecture for an automated ticket issuing system used by passengers at a railway station, based on your choice of model. (6 Marks)

5. (a) Develop the design of the weather station design in detail by writing interface descriptions of the identified objects. Express it in $C++$ programming language. (10 Marks)

   (b) Explain how data dictionaries may be used to supplement design information in data-flow diagrams and structure charts. (5 Marks)

Contd.... 2

(c) Suggest situations in which it is unwise or impossible to provide a consistent user interface. (5 Marks)

6. (a) Suggest six reasons why software reliability is important. Using an example explain the difficulties of describing what software reliability means. (10 Marks)

(b) Write a set of guidelines for C++ programmers which give advice on how to make functions resuable. (5 Marks)

(c) Explain fault tolerance. (5 Marks)

7. (a) Explain how back-to-back testing may be used to test their own programs in an objective way. (6 Marks)

(b) Discuss the differences between black-box and structural testing and suggest how they can be used together in the defect testing process. (8 Marks)

(c) Using your knowledge of C++ programming language, derive a checklist of common errors (not syntax errors) which could not be detected by a compiler but which might be detected in a program inspection. (6 Marks)

8. (a) Briefly explain the purpose of each of the sections in a software project plan. (6 Marks)

(b) What factors should be taken into account when selecting staff to work on a software development project? (8 Marks)

(c) In the development of large, embedded real time systems, suggest five factors which are likely to have a significant effect on the productivity of the software development team. (6 Marks)

** * **

NEW SCHEME

CS/IS62

USN | | | | | | | | | | |

Sixth Semester B.E. Degree Examination, July/August 2005

Computer Science / Information Science and Engineering

Software Engineering

Time: 3 hrs.] [Max.Marks : 100

Note: *1. Answer any FIVE full questions.*
2. Answers to be specific and within the preview of subject matter.

1. (a) Explain how both the waterfall model and the protyping model can be accommodated in the spiral process model. **(4 Marks)**

   (b) Mention the six specific design process activities. Give explanation for two of them. **(6 Marks)**

   (c) Table 1.C gives the task duration for software project activities. Draw an activity chart. **(10 Marks)**

Task	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}	T_{13}	T_{14}	T_{15}
Duration in days	10	15	10	20	10	15	20	35	15	05	10	20	35	10	20
Dependencies	-	T_1	T_1, T_2	-	-	T_3, T_4	T_3	T_7	T_3, T_6	T_5, T_9	T_9	T_{10}	T_3, T_4	T_8, T_9	T_9, T_{14}

Table 1.C

2. (a) Give the IEEE standard format for requirement document. **(7 Marks)**

   (b) Indicate the principle stages of VORD. **(7 Marks)**

   (c) Highlight the importance of DFD in software engineering life cycle. **(6 Marks)**

3. (a) Mention four weaknesses of structured analysis methods. **(4 Marks)**

   (b) Draw evaluationary prototyping flow diagram and mention its two main advantages. **(6 Marks)**

   (c) Bring out the advantages and disadvantages of a shared repository. **(10 Marks)**

4. (a) What are the four parameters of a system which affects the system architecture? Explain. **(6 Marks)**

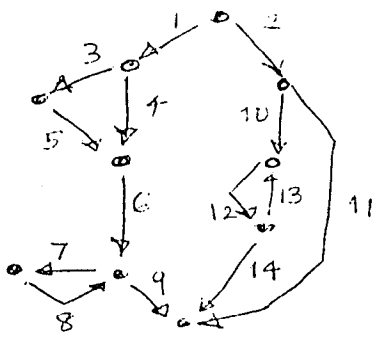
   (b) Compare functional points and line of code with respect to a software life cycle. **(14 Marks)**

5. (a) Give the characteristics of GUI with description. **(4 Marks)**

   (b) Distinguish between software verification and validation. **(6 Marks)**

Contd.... 2

(c) For the Figure5(c) shows a simple flow graph of a program. Indicate the minimal set of paths that satisfies white-box strategies. (10 Marks)



6. (a) Mention five levels in P-CMM model. Explain each of them. (8 Marks)

(b) Suggest meaningful names for the variables used in the program shown below and construct data dictionary entries for these names. (12 Marks)

```
routine BS(K,T,S,L)
T:=1
N×T : if S >= T go to CON
L=-1
go to STP
CON : L : =INTEGER (T/S)
L:=INTEGER(T+S)/2)
if T(L)=K then return
if T(L)>K then go to GRT
S:=L+1
go to N×T
GRT : S : = L-1
go to N×T
STP : end.
```

7. (a) For different forms of COCOMO give project complexity, formula and effort estimation plots. (10 Marks)

(b) Suppose that you are developing the software for a nuclear power plant control system. Select the most appropriate mode for the project and use the COCOMO model to give a crude estimate of the total number of person months required for the development, assuming that the estimated software size is 10,000 delivered source instructions. (10 Marks)

8. Write explanatory notes on :

(a) Ethnography

(b) Group cohesiveness

(c) Software equation

(d) Case Work benches. (4×5=20 Marks)

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CS/IS6T2

USN | | | | | | | | | | |

Sixth Semester B.E. Degree Examination, July/August 2005

Computer Science/Information Science Engineering

(Old Scheme)

Software Engineering

Time: 3 hrs.] [Max.Marks : 100

Note: *1. Answer any FIVE full questions.*

1. (a) Distinguish between software product and software process. (6 Marks)
   (b) What are the professional responsibilities of a software engineer? (4 Marks)
   (c) Define a system. Describe the problem that arise during system analysis and design. (10 Marks)

2. (a) Describe the structure of a requirements document. (10 Marks)
   (b) Explain the reasons that make requirements analysis a difficult process. (6 Marks)
   (c) Show the VORD method of requirement analysis with a brief explanation. (4 Marks)

3. (a) Explain the non-functional requirements of a system. (6 Marks)
   (b) Mention the benefits of developing a prototype. (6 Marks)
   (c) Draw the block diagram showing the different design activities. (4 Marks)
   (d) How adaptability enhances the quality of software design? (4 Marks)

4. (a) Explain the components required by client-server architectural model. (6 Marks)
   (b) Describe the features of event-driven systems required for contorl models. (8 Marks)
   (c) Mention the characteristics of object oriented design useful for software engineering. (6 Marks)

5. (a) Draw a data flow diagram for the following application:

   A salary system which computes employee wages per week and deductions. Input to the system is a worksheet containing emp.id, name, number of hours worked, number of overtime hours worked etc. System maintains tables holding tax rates and pay rate for various employee categories. The output is salary slip containing all the details. (8 Marks)

   (b) Describe the design factors to be used in error messaging. (7 Marks)
   (c) How effectively colours can be used to present user interface design? (5 Marks)

Contd.... 2

6. (a) What are reasons that make software reliability an important factor now-a-days? (8 Marks)

   (b) Describe the different constructs which would minimize the occurence of faults. (8 Marks)

   (c) Define POFOD and MTTF. (4 Marks)

7. (a) Explain the advantages of software development with reuse. (8 Marks)

   (b) Describe the fault classes to be verified during inspection check. (8 Marks)

   (c) What is CASE? How does it enable the design and development activities of a software system. (4 Marks)

8. (a) Explain the various factors influencing the staff selection for software projects. (8 Marks)

   (b) Describe, how software engineering productivity can be improved? (7 Marks)

   (c) Explain the different program quality metrics. (5 Marks)

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CS62

NEW SCHEME

Reg. No.

Sixth Semester B.E. Degree Examination, January/February 2006

Computer Science Information Science & Engineering

Software Engineering

Time: 3 hrs.) (Max.Marks : 100

Note: *Answer any FIVE full questions.*

1. (a) Software is a product. Justify this statement. (4 Marks)
   (b) Explain the different attributes of a good software. (6 Marks)
   (c) Describe the salient features of spiral model of software process with an illustrative diagram. (10 Marks)
2. (a) Explain the different stages in the testing process with a neat block diagram. (8 Marks)
   (b) What are various metrics for specifying non-functional requirements? (4 Marks)
   (c) Write the structure of a requirements document. (8 Marks)
3. (a) Describe the requirements elicitation and analysis process with a neat figure. (8 Marks)
   (b) Explain the various types of checks to be carried out during requirements validation. (7 Marks)
   (c) What are different types of volatile requirements? (5 Marks)
4. (a) Mention the several rapid prototyping techniques. Describe any one of them. (6 Marks)
   (b) Describe the suitability of interrupt - driven models for architectural design. (6 Marks)
   (c) Explain the guidelines to be observed while designing user interface. (8 Marks)
5. (a) How effectively could a colour be exploited in user interface design? (8 Marks)
   (b) Describe the user interface evaluation process. (8 Marks)
   (c) Define critical systems. Enumerate three types of critical systems. (4 Marks)
6. (a) Explain the various reliability metrics. (8 Marks)
   (b) Describe the characteristics of cleanroom software development. (8 Marks)
   (c) Briefly explain the top-down and bottom-up testing processes. (4 Marks)
7. (a) What types of plan are envisaged for project planning by management? (8 Marks)
   (b) Describe the cost estimation techniques for software development. (8 Marks)
   (c) Mention the various software product metrics. (4 Marks)
8. (a) Describe the components of legacy systems with a block diagram. (10 Marks)
   (b) Explain the activities involved in re-engineering process with an illustrative figure. (10 Marks)

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CS/IS62

USN

NEW SCHEME

Sixth Semester B.E. Degree Examination, July 2006
CS/IS
Software Engineering

Time: 3 hrs.] [Max. Marks:100

Note: *1. Answer any FIVE full questions.*

1 a. Highlight on essential attributes of a good software. **(06 Marks)**

b. Show how both waterfall model and prototyping model can be accounted in spiral model. **(07 Marks)**

c. What is software validation? Explain with an example. **(07 Marks)**

2 a. What are the various metrics for specifying non-functional requirements? Explain any one. **(04 Marks)**

b. Explain requirement elicitation and analysis process. **(06 Marks)**

c. Explain evolutionary prototyping. Justify that programs developed using evolutionary development are likely to be difficult to maintain. **(10 Marks)**

3 a. What is data dictionary? Discuss its structure and uses. **(06 Marks)**

b. Develop an aggregation diagram showing the components of a library system. **(06 Marks)**

c. Highlight on enduring and volatile requirements. Also give the classifications of volatile requirements. **(08 Marks)**

4 a. Illustrate with two examples for object and object class. **(06 Marks)**

b. With an example describe the repository model and give its advantages and disadvantages. **(06 Marks)**

c. Explain different types of user interaction styles. Give advantages, disadvantages and applications for each style. **(08 Marks)**

5 a. Compare black box testing with white box testing. **(04 Marks)**

b. Explain interface types and interface errors in interface testing. **(06 Marks)**

c. For a software project different activities and their durations are listed as below. Draw the activity chart and find critical path. **(10 Marks)**

Task	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9
Duration in days	10	15	10	20	10	15	20	35	15
10	-	T_1	T_1 T_2	-	-	T_3 T_4	T_3	T_7	T_6

T_{10}	T_{11}	T_{12}	T_{13}	T_{14}	T_{15}	T_{16}
5	10	20	35	10	20	10
T_5 T_9	T_9	T_{10}	T_3 T_4	T_8 T_9	T_{12} T_{14}	T_{15}

6 a. What do you mean by reliability metric? Explain any two metrics which helps in assessment of system performance. **(06 Marks)**

b. Explain various safety terminologies. **(06 Marks)**

c. Illustrate with an example how COCOMO model is used to estimate person months. **(08 Marks)**

7 a. What are the activities in project planning? **(04 Marks)**

b. Describe the components of a legacy system and give block diagram for the same. **(06 Marks)**

c. What is inspection process? Explain roles of inspection process and possible inspection checks. **(10 Marks)**

8 Write short notes on:

a. Product metric b. Case workbench

c. Reverse Engineering d. Centralized control model. **(20 Marks)**

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CS62

USN

NEW SCHEME

Sixth Semester B.E. Degree Examination, Dec. 06 / Jan. 07
CS / IS
Software Engineering

Time: 3 hrs.] [Max. Marks:100

Note : *Answer any FIVE full questions.*

1 a. Describe the professional responsibilities of a software engineer. (05 Marks)
b. Describe the functional classification of CASE tools. (06 Marks)
c. Briefly discuss the Bohem's spiral model. Compare it with prototyping. (09 Marks)

2 a. Describe the functional and nonfunctional requirements with examples. (10 Marks)
b. With an example, explain the use of view point template and service template and service template in the VORD method. (06 Marks)
c. Identify four different matrix for specifying nonfunctional requirements. (04 Marks)

3 a. With an example describe the repository model and discuss its advantages and disadvantages. (08 Marks)
b. What are the advantages and disadvantages of evolutionary and throwaway prototyping? (06 Marks)
c. Explain any two rapid prototyping techniques. (06 Marks)

4 a. What are the advantages and disadvantages of client server model?
b. Discuss in detail both centralized and event based control models with examples.
c. What are the five different types of user and system documents supplied with any software systems?

5 a. Describe the characteristics of an OOAD, its advantages and explain the typical activities performed during this process. (10 Marks)
b. For each of the following three interaction styles, identify advantages, disadvantages and the application examples where they are used.
i) Direct manipulation
ii) Menu selection and
iii) Forms fill in. (06 Marks)
c. Briefly discuss four usability metrics. (04 Marks)

6 a. What is verification and validation? (02 Marks)
b. Explain static and dynamic testing technologies. (06 Marks)
c. Briefly explain with a diagram clean-room software development. (04 Marks)
d. Explain the differences between white box and black box testing. (08 Marks)

7 a. What is dependability? Precisely define the four factors. (06 Marks)
b. Explain POFOD, ROCOF with examples. (06 Marks)
c. Explain reverse engineering process. What are the advantages and disadvantages? (08 Marks)

8 a. What are the areas covered by ISO 9001 model for quality assurance? (10 Marks)
b. Explain software quality attributes. (05 Marks)
c. Identify the risks and risk types. (05 Marks)

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CS62

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NEW SCHEME

Sixth Semester B.E. Degree Examination, July 2007
CS / IS
Software Engineering

Time: 3 hrs.] [Max. Marks:100

Note : ***Answer any FIVE full questions.***

1 a. Explain key challenges facing software engineering. **(04 Marks)**
b. What is process iteration? Describe the hybrid models of software development. **(10 Marks)**
c. Describe the general model of design process. **(06 Marks)**

2 a. Explain the structure of software requirements document. **(10 Marks)**
b. Why elicitation and analysis is a difficult process? Explain giving reasons. **(05 Marks)**
c. What are the different types of checks that should be carried out on requirements in requirements document? **(05 Marks)**

3 a. What are the benefits of developing a system prototype? Explain. **(06 Marks)**
b. Describe a software process with throw away prototyping. What are the problems with this approach? **(08 Marks)**
c. What is a CASE workbench? Describe the tools included in an analysis and design workbench. **(06 Marks)**

4 a. What is modular decomposition? Explain dataflow model of an invoice processing system. **(05 Marks)**
b. Draw and explain sequence diagram and state diagram for a typical weather station. **(10 Marks)**
c. What are the guidelines that should be followed while using colour in a user interface? **(05 Marks)**

5 a. Describe the general inspection process. Also discuss possible inspection checks. **(08 Marks)**
b. Describe the metrics for specifying software reliability and availability. **(06 Marks)**
c. What is integration testing? Compare top down and bottom up testing. **(06 Marks)**

6 a. Explain the COCOMO2 costing model. **(10 Marks)**
b. Describe the project planning process, give pseudocode. **(05 Marks)**
c. Describe the factors affecting software engineering productivity. **(05 Marks)**

7 a. Which is the widely used method of validating the quality of process or product? Explain. **(06 Marks)**
b. Describe the static product metrics for assessing the quality attributes. **(08 Marks)**
c. Why assessment of legacy systems is required? Describe the strategies used for evolving these systems. **(06 Marks)**

8 Write short notes on :
a. Path testing
b. Context models
c. Activity network
d. Safety life cycle. **(20 Marks)**

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CS62

Sixth Semester B.E. Degree Examination, Dec. 07 / Jan. 08
Software Engineering

Time: 3 hrs. Max. Marks:100

Note : *Answer any FIVE full questions.*

1 a. Explain the term software engineering. What are the key challenges that a software engineering is facing? (05 Marks)
b. What is software process model? Why is incremental model called hybrid model? Explain it with a neat diagram quoting its merits and demerits. (10 Marks)
c. Write a block diagram that illustrates classification of CASE from integration perspective. (05 Marks)

2 a. What is the objective of requirements engineering? Illustrate the various activities of requirements engineering with a neat diagram. (06 Marks)
b. Why is project planning an iterative activity? Briefly explain the purpose of each section in a project plan. (08 Marks)
c. From the evolution perspective classify the requirements of a software product (06 Marks)

3 a. Write the importance of requirements validation. List the various validation techniques and explain any one in detail. (08 Marks)
b. What are the problems in using natural language for specifying system requirements? Explain how structured natural language overcomes these problems with an example. (10 Marks)
c. What is the difference between milestone and deliverable? (02 Marks)

4 a. Based on your experience with a bank ATM draw a DFD modeling the processing involved when a customer withdraws cash from the machine. (05 Marks)
b. What are the benefits of developing a system prototype? Compare evolutionary prototyping with throwaway prototyping. (10 Marks)
c. What are control models? Write a brief note on call return control model. (05 Marks)

5 a. What are user interface design principles? (06 Marks)
b. Briefly outline the techniques for user interface evaluation. (08 Marks)
c. Define dependability of a computer system. What are the four principal dimensions of dependability? (06 Marks)

6 a. Which are the metrics available for specifying the reliability requirements quantitatively? (04 Marks)
b. What are the types of errors discovered through program inspection? (06 Marks)
c. Write the difference between black box testing and structural testing. With a suitable example explain black box testing approach. (10 Marks)

7 a. Explain the approach used by COCOMO model to estimate the person months for a software project. (10 Marks)
b. With a neat diagram explain the logical parts of a legacy system. (10 Marks)

8 Write short notes on :
a. Ethnography
b. Metrics for nonfunctional requirement
c. Stress testing
d. Clean room software development. (20 Marks)

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06IS51

Fifth Semester B.E. Degree Examination, Dec.08/Jan.09
Software Engineering

Time: 3 hrs Max. Marks:100

Note: ***Answer any FIVE full questions choosing at least TWO from each part.***

PART – A

1 a. Give a brief description of four essential attributes of a good software. **(05 Marks)**

b. Describe four professional responsibilities of a software engineer. **(05 Marks)**

c. Explain the activities involved in the system design process. **(10 Marks)**

2 a. What are the most important dimensions of system dependability? **(05 Marks)**

b. Give five reasons why dependability is important in critical systems. **(05 Marks)**

c. Describe the salient features of spiral model of software process with an illustration diagram. **(10 Marks)**

3 a. What is non-functional requirement? Explain the different types of non-functional requirements. **(05 Marks)**

b. Write the structure of a requirements document suggested by IEEE standard. **(05 Marks)**

c. What are enduring and volatile requirements? Also give the classification of volatile requirement with brief explanation. **(10 Marks)**

4 a. "Risk management process is an iterative process." Justify the above statement with a neat diagram. **(05 Marks)**

b. Explain the object aggregation with an example. **(05 Marks)**

c. For a software project different activities and their durations are listed as below. Draw the activity network and find the critical path. **(10 Marks)**

Task	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
Duration (in days)	8	15	15	10	10	5	20	25	15	15	7	10
Dependencies	-	-	T_1	-	T_2,T_4	T_1,T_2	T_1	T_4	T_3,T_6	T_5,T_7	T_9	T_{11}

PART – B

5 a. With an example describe the repository model and give its advantages and disadvantages. **(05 Marks)**

b. Illustrate with two examples for object and object class. **(05 Marks)**

c. Draw and explain sequence diagram and state diagram for a typical weather station. **(10 Marks)**

6 a. Give a brief description of five principles of agile methods. **(05 Marks)**

b. Discuss the advantages of pair programming. **(05 Marks)**

c. Briefly describe the three types of software maintenance. Why is it sometimes difficult to distinguish between them? **(10 Marks)**

7 a. Explain the two distinct goals of a software testing. **(05 Marks)**

b. Explain the characteristics of clean room software development. **(05 Marks)**

c. Discuss the differences between black-box and structural testing and suggest how they can be used together in the defect testing process. **(10 Marks)**

8 a. Describe with a block diagram, SEI People – CMM (Capability Maturity Model). **(10 Marks)**

b. Illustrate with an example how basic COCOMO 81 model is used to estimate person months. **(10 Marks)**

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06IS51

Fifth Semester B.E. Degree Examination, Dec.09/Jan.10

Software Engineering

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting at least TWO questions from each part.***

PART – A

1 a. What are the attributes of a good software? Explain. **(06 Marks)**
b. Mention the different stages in a system development. Explain any four phases. **(10 Marks)**
c. Define and distinguish between the system reliability and availability. **(04 Marks)**

2 a. What is process iteration? Explain Boehm's spiral model. **(10 Marks)**
b. With an example, explain the functional and non-functional requirements. **(10 Marks)**

3 a. Explain the need for requirements elicitation and analysis. Explain the different process activities involved. **(10 Marks)**
b. Why risk management is important in project management? Explain different stages in risk management. **(10 Marks)**

4 a. What is data flow model? With an example, show the notations used in data flow model. **(10 Marks)**
b. Explain the terms :
i) Domain requirements **(03 Marks)**
ii) User requirements **(03 Marks)**
iii) System requirements. **(04 Marks)**

PART – B

5 a. Explain why it is necessary to design the system architecture. What are the system factors affected by system architecture? Explain. **(10 Marks)**
b. Distinguish between an object and an object class. Give example. **(06 Marks)**
c. What are concurrent objects? Explain different kinds of concurrent object implementations. **(04 Marks)**

6 a. What is rapid delivery and deployment of new systems? Explain its importance. **(10 Marks)**
b. What are the different types of software maintenance? What are the key factors that distinguish development and maintenance? **(10 Marks)**

7 a. Distinguish between software inspection and testing. What are the advantages of inspection over testing? **(08 Marks)**
b. Explain with illustrations :
i) Integration testing **(06 Marks)**
ii) Release testing **(06 Marks)**

8 a. Explain Maslow's human-needs hierarchy of motivating people. **(10 Marks)**
b. What are the factors affecting software pricing? What are the two types of metrics used? Explain. **(10 Marks)**

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06IS51

Fifth Semester B.E. Degree Examination, May/June 2010
Software Engineering

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting at least TWO questions from each part.***

PART – A

1 a. What are the key challenges facing software engineering? Explain. **(04 Marks)**

b. What are emergent system properties? Give examples for each. **(04 Marks)**

c. With a figure, explain the requirements of an engineering process. **(12 Marks)**

2 a. With a figure, explain the phases in the RUP. **(05 Marks)**

b. Explain the functional and non-functional requirements for any system. **(10 Marks)**

c. Give the number of possible metrics to specify non-functional system properties. **(05 Marks)**

3 a. What is an architectural design? Explain the architectural design decisions. **(06 Marks)**

b. Why requirements need to be validated? Explain the check made in requirement validation. **(06 Marks)**

c. Explain the requirement elicitation and analysis phase, with spiral diagram. Give reasons, why is it difficult phase in requirements engineering process. **(08 Marks)**

4 a. Explain the IEEE standard format for the requirement document in detail. **(06 Marks)**

b. Draw and explain the use-case diagram and sequence diagram for a library system or ATM withdraw system. **(06 Marks)**

c. Refer table below for task durations and interdependencies:

Task	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}
Duration in days	9	16	11	15	7	20	26	15	15	16
Interdependencies	-	-	-	T_1 (M_1)	T_1T_2 (M_2)	T_2T_3 (M_3)	T_3 (M_5)	T_4T_5 (M_4)	T_5T_6 (M_6)	T_8 (M_7)

i) Draw activity network ii) Find and highlight critical path. **(08 Marks)**

PART – B

5 a. Name and explain the three organizational styles that are very widely used, with necessary figure. **(10 Marks)**

b. Explain with a figure, the central control and event based control system. **(10 Marks)**

6 a. What are agile methods? Discuss the principles of agile methods. **(07 Marks)**

b. What are the practices followed in extreme programming? **(06 Marks)**

c. With a figure, explain the process of prototype development. What are the benefits of using prototyping? **(07 Marks)**

7 a. What is verification and validation? Explain why validation is a particularly difficult process. **(05 Marks)**

b. Explain the software development process model, using V-model with figure. **(10 Marks)**

c. The clean room approach to software development is based on five key strategies. Explain them. **(05 Marks)**

8 a. Name and explain the factors governing staff selection. **(10 Marks)**

b. Explain with a figure, the people capability maturity model. **(10 Marks)**

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