

END-TERM EXAMINATION

DECEMBER 2006

Exam Series code: 100736DEC06200778	
Paper Code : MCA-209	Subject: Software Engineering
Time: 3 Hours	Maximum Marks: 60
Note: Question No. 1 is compulsory. Attempt any one question from every unit (1 to 4). In all, five question need to be attempted.	

- Q. 1. (a) Write short notes on :- (10)
- (i) Validation and verification.
 - (ii) Product metrics.
 - (iii) Reverse Engineering
 - (iv) Regression testing
 - (v) Information flow metrics
- (b) What is software crisis? Was Y2K a software crisis? (2)
- (c) List out requirements elicitation techniques. (2)
- (b) What is the difference between a flow chart and a structure chart? (3)
- (b) Which one is the most appropriate size estimation technique and why? (3)

UNIT - I

- Q. 2. (a) What are the components of a software? Discuss how a software differs from a program. (4)
- (b) Describe the Rapid development (RAD) model. Discuss each phase in details. (6)
- Q. 3. (a) Draw a use case diagram for result preparation automation system of B. Tech courses of any university. (4)
- (b) Explain the Spiral model of software development. What are the limitations of such a model? (6)

UNIT - II

- Q. 4. (a) Describe any two software size estimation techniques. (5)
- (b) Define module coupling and explain different type of coupling. (5)
- Q. 5. (a) Discuss various types of constructive Cost Most (COCOMO). Explain the phase wise distribution of effort. (5)

(b) Discuss the differences between function oriented and object oriented design. (5)

UNIT -III

Q. 6. (a) Define data structure metrics. How can we calculate amount of data in a program? (5)

(b) Compare the ISO 9126 with McCall's Software Quality model. (5)

Q. 7. (a) Explain the Halstead theory of software science. Is it significant in today's scenario of component based software development? (4)

(b) Discuss various key process area of CMM at various maturity levels. (6)

UNIT-IV

Q. 8. (a) Discuss the cause effect graphing technique with an example. (5)

(b) What is regression testing? Differentiate between regression and development testing. (5)

Q. 9. (a) What is ripple effect? Discuss the various aspects of ripple effect and how does it affect the stability of a program? (5)

(b) What are various kinds of functional testing? Describe any one in detail. (5)

END-TERM EXAMINATION

Third Semester [MCA] - DECEMBER 2005

Paper Code: MCA 209

Subject: Software Engineering

Time: 3 Hours

(Batch-2004)

Maximum Marks: 60

Note: Attempt five questions in all, including Q. 1 which is compulsory. All Question carry equal marks.

Q. 1. (A) Select most appropriate answer of the following questions: **(10)**

- (i) UML Stands for
 - (i) Uniform modeling Language
 - (ii) Unified modeling language
 - (iii) Unit modeling language
 - (iv) Universal modeling language

- (ii) Which is not a product metric?
 - (i) Size
 - (ii) Reliability
 - (iii) Productivity
 - (iv) Functionality

- (iii) Level-0 Diagram is similar to
 - (i) Use case diagram
 - (ii) Context Diagram
 - (iii) System Diagram
 - (iv) None of the Above

- (iv) IFPUG stands for
 - (i) Initial function point uniform group
 - (ii) International function point uniform group
 - (iii) International function point user group
 - (iv) Initial function point user group

- (v) Which is not a size metric
 - (i) LOC
 - (ii) Function count
 - (iii) Program Length
 - (iv) Cyclomatic complexity

- (vi) Maximum possible value of reliability is
 - (i) 100
 - (ii) 10
 - (iii) 1
 - (iv) 0

- (vii) DD path graph is called as
 - (i) Design to Design path graph
 - (ii) Defeat to defeat path graph
 - (iii) Destination to destination path graph
 - (iv) None of the Above

- (viii) Which one is not the verification activity?
 - (i) Reviews
 - (ii) Path Testing
 - (iii) Walkthrough
 - (iv) Acceptance Testing

- (ix) Patch is known as
 - (i) Emerging fixes
 - (ii) Routine fixes
 - (iii) Critical Fixes
 - (iv) None of the Above

- (x) System documentation may not have
 - (i) SRS
 - (ii) Design document
 - (iii) Acceptance Test Plan
 - (iv) System Administration

- (B) (a) What is software crisis? Give example. (10)
- (b) Write various steps of requirement engineering
- (c) What is risk?
- (d) Define module coupling
- (e) Explain the significance of bath tub curve of reliability with the help of diagram.

Q. 2. (a) Why documentation is necessary? Name various documents produced after each steps of s/w life cycle. (3)

(b) Compare iterative enhancement model and evolutionary developed model. (3)

(c) What is SRS? List out the advantages of SRS standards. Why SRS is known as the black box specification of a system? (4)

Q. 3. (a) Draw a DFD for borrowing a book in a library in which a borrower can borrow a book if it is available else he can reserve the book if he wishes to. He can borrow a maximum of these books. (5)

(b) What is size metric? How is function point metric advantageous over LOC metric? Explain. (5)

- Q. 4. (a) A software development requires 90PY during total development sub cycle. The development time is planned for the duration of 3 years and six months.
(i) Calculate the manpower cost expanded until development time.
(ii) Determine the development peak time. (4)
- (b) Define module cohesion. Explain different types of cohesion. (6)
- Q. 5. (a) Define data structure metrics. Explain various data structure metrics. (6)
- (b) Discuss the basic model of software reliability. How can $\Delta\mu$ & $\Delta\tau$ be calculated (4)
- Q. 6. (a) Give Halstead's software science measures for :- (5)
- (i) Program Length
 - (ii) Program Volume
 - (iii) Program Level
 - (iv) Effort
 - (v) Language Level
- (b) What is the difference between:- (5)
- (i) Alpha Testing & Beta Testing
 - (ii) Development Testing and Regression Testing
- Q. 7. (a) Explain the boundary value analysis technique with the help of example. (2)
- (b) Explain data flow testing. Consider an example and show all "du" paths. Also identify those "du" paths that are not "de" paths. (5)
- (c) Describe Boehm's model for maintenance. (3)

END-TERM EXAMINATION

Fourth Semester [MCA] - MAY 2005

Paper Code: MCA 206

Subject: Software Engineering

Time: 3 Hours

Maximum Marks: 60

Note: Attempt any five questions.

- Q. 1. (a) What are the advantages of using software process models? Explain the prototype and spiral model in detail. (8)
- (b) What process model you will follow for developing (i) Editor (ii) Radiation therapy machine software. Justify your answer. (4)
- Q. 2. (a) Describe briefly different stages of risk management process. (6)
- (b) The value of size of program in KLOC and different cost drivers are given below: size – 300 KLOC, Complexity 0.95, Analyst capability – 1.05, Applications of Software Engineering Methods – 0.8, Performance Requirement – 0.75. Calculate the effort for three types of projects i.e. organic, semidetached and embedded using COCOMO model. (6)
- Q. 3. (a) What is the use of drawing context diagram? (2)
- (b) A blood bank receives and stores blood donated by people and also gives blood to individuals or hospitals on demand. The blood bank also has a panel of vendors who supply various items after receiving the order from the blood bank. If a donor approaches the blood bank, his blood sample is taken and test for various diseases. If approved blood is taken and stored in the bank. The contact details of donor are recorded and donor is issued a card which is valid for one year. During this period the donor by showing the card can get the blood from the blood bank. From time to time blood bank organizes the blood donation camp. Date and venue is announced in the newspaper and existing regular donor are also informed by post. The blood bank also has a panel of doctors. Two doctors from the panel are also associated with the camp to handle emergencies. For these requirements draw (i) ER diagram (ii) Context diagram. (6+4)
- Q. 4. (a) Define each of the following terms:- (6)
- (i) Structure chart
 - (ii) Transaction Centered Design
 - (iii) Control Coupling
 - (iv) Temporal Cohesion
 - (v) Requirement
 - (vi) Software requirement Specification
 - (vii) Adaptive Maintenance
 - (viii) Error

(b) Explain briefly Information Flow Metrics. For the structure chart given below in Fig.1. Calculate the information flow index of individual modules as well as whole software. (6)

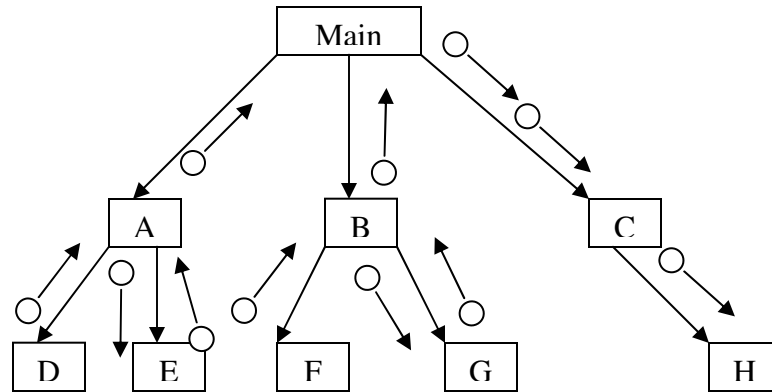


Fig. 1.

- Q. 5. (a) What is the difference between what box and black testing? Explain in detail some white box testing techniques discussed in the class. (12)
- Q. 6. (a) Define software reliability. How it is different from hardware reliability. (2)
 (b) What are the main objectives of Reverse Engineering? (4)
 (c) Write short notes on Basic Execution Time Model. (6)
- Q. 7. (a) Write short notes on Any two: (6 + 6)
 (i) Capability Maturity Model
 (ii) Configuration Management
 (iii) Software Reengineering
 (iv) CASE Tools

END-TERM EXAMINATION

Fourth Semester [MCA] - MAY 2003

Paper Code: MCA 206	Subject: Software Engineering
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Time: 3 Hours	Maximum Marks: 60
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Note: Attempt any five questions. All questions carry equal marks.

- Q. 1. (a) Explain the significance of Software Engineering. Discuss the advantages of using any software standard for software development. (5)
- (b) List the difference of CMM and ISO 9001. Why is it suggested that CMM is the better choice than ISO 9001. (7)
- Q. 2. (a) Show why and how software metrics can improve the software process. Enumerate the effect of metrics on software productivity. (5)
- (b) Write a program in C for the calculation of the roots of a quadratic equation. Find out its all software science metrics. (7)
- Q. 3. (a) What is risk? Is it economical to do risk management? Analyze a student project and list the risks. (5)
- (b) Explain the Putnam Resource Allocation model. (7)
- Q. 4. (a) What are the linkages between data flow and E-R diagram? (5)
- (b) An airline reservation is an association between a passenger, a flight, and a seat. Select a few pertinent attributes for each of these entity types and represent airline reservation in an E-R diagram. (7)
- Q. 5. (a) If some existing modules are to be re-used in building a new system, which design strategy is used and why? (5)
- (b) Define module coupling and explain different types of coupling. (7)
- Q. 6. (a) Consider a program for the determination of the nature of roots of a quadratic equation. Its input is a triple of positive integers (say a, b, c) and value may be from [1, 100]. The program output may have one of the following words: [not a quadratic equation; Real Roots; Imaginary Roots; Equal Roots]. Design the boundary value test cases. (7)
- (b) Consider a small program and show, why it is practically impossible to do exhaustive testing. (5)

Q. 7. (a) Annual Change Traffic (ACT) in a software system is 25% per year. The initial development cost was Rs. 20 Lacs. Total lifetime for the software is 10 years. What is the total cost of the software system? **(6)**

(b) What is reverse engineering? Explain the various levels of reverse engineering. **(6)**

Q. 8. (a) Write short notes on Any two: **(12)**

- (i) Logarithmic Poisson Reliability Model
- (ii) Configuration Management
- (iii) Function Count

END-TERM EXAMINATION

Fourth Semester [MCA] - JUNE 2001

Paper Code: MCA 206

Subject: Software Engineering

Time: 3 Hours

Maximum Marks: 60

Note: Attempt any five questions.

- Q. 1. (a) State the difference between program and software. Why document and documentation have become very important? (4)
- (b) What do you understand by the term life cycle model of software development? Describe the genetic waterfall model? (5)
- (c) List the difference of CMM and ISO 9001. Why is it suggested that CMM is the better choice than ISO 9001? (5)
- Q. 2. (a) What are software metrics? Discuss Halstead software sciences metrics along with its limitations. (7)
- (b) Explain Function Point Analysis method. Compute the function points for the following data set.
Inputs = 8, Outputs = 12, Inquiries = 4, Logical Files = 41, Interfaces = 1
 $\Sigma F_i = 41$ (Influence factor sum) (7)
- Q. 3. (a) You are the manager of a new project charged with developing a 100000 lines embedded system. You have a choice of hiring from two pools of developers; highly capable with very little experience in the programming language being used; or developers of low quality but a lot of experience with the programming language. What is the impact of hiring all the developers from one or the other group? (10)
- (b) What are risk management activities? Is it possible to prioritize the risks? (4)
- Q. 4. (a) Discuss the significance and use of requirement engineering. What are the problems in the formulation of requirements? (4)
- (b) Why is SRS also known as the black box specification of system? List the important issues, which an SRS must address. (4)
- (c) What are the linkages between data flow and E-R diagrams? (4)
- (d) Draw an E-R diagram for the statement given below :- (2)
“Vendors quote prices for several parts along with quantity of parts.”

Q. 5. (a) Define module coupling and cohesion. Explain different types of coupling and cohesion. (7)

(b) Write short notes on (7)
(i) Function Oriented Design (ii) Object Oriented Design

Q. 6. (a) What is software reliability? In that context what is mean time to failure? How can we estimate it? (7)

(b) Consider a simple program to classify a triangle. Its input is a triple of positive integers (say a, b, c) and the data type for input parameters ensures that these will be integers greater than zero and less than or equal to 200. The program output may be one of the following words:
[Scalene, Isosceles, Equilateral; Not a triangle] (7)

Design the boundary value test cases.

Q. 7. (a) What is cyclomatic complexity? Is it reasonable to define “thresholds” for software modules? If $V(G) \leq 10$, What will happen to the module? (7)

(b) What is the difference between functional and structural testing? Explain any two functional testing techniques. (7)

Q. 8. (a) Write short notes on Any two: (7+7)
(i) Reverse Engineering
(ii) Software Reliability Models
(iii) Putnam Resource Allocation Model.
