(Please write your Exam Roll No.) *Exam Roll No.* 05714202011

END TERM EXAMINATION

FOURTH SEMESTER [BCA] MAY-JUNE-2013

Paper Code: BCA208 ***Subject: Software Engineering (New)***

Time : 3 Hours ***Maximum Marks :75***

Note: Attempt any five questions including Q.no.1 which is compulsory. Select one question from each unit. Scientific calculator is allowed.

Q1. Attempt any five of the following: 5x5 = 25

a. Write a short note on Cause Effect Graphing Technique.
b. What is data dictionary? Why is it useful?
c. Write short notes on Regression Testing and Reverse Engineering.
d. Explain various Risk Management Activities.
e. Why is the primary goal of software development now shifting from producing good quality software to good quality maintainable software?
f. Write a short note on FAST (Facilitated Application Specification Technique).

Unit I

Q2. a) Explain in detail prototype model. What are the advantages and disadvantages of developing a prototype of a system? 6.5

b) Consider the problem of Student Admission System of a University, which is to be automated. For this system: Draw a Use Case Diagram and 1- level DFD (Write you assumptions, if any) 6

OR

Q3. a) Explain Spiral Model in detail. What are its advantages and disadvantages? 6.5

b) Consider the following problem statement: 6

A Police Vehicle & Control System ensures that incidents are logged and routed to the most appropriate police vehicle. Some incidents are more serious than others and require a more urgent response. The classes of response are identified and incidents are allocated to these classes. The position of the vehicle is also taken into account so that the closest vehicle is sent to respond to the incident. Some incidents may require more than one vehicle and some incidents, like accidents, may require specialized vehicles. Location of incident may also decide the number of vehicles to be sent. The emergency services like the fire and ambulance services are automatically alerted. The details of the reporter of the incident are also logged. At the end, the report of the police on the incident is produced.

Draw a Use Case Diagram and 1-level DFD (Write your assumptions, if any)

Unit II

Q4. a) A project size of 400 KLOC is to be developed. Software development team has very little previous experience. The project schedule is very tight. Calculate the effort, development time, average staff size and productivity of the project. Refer "Basic COCOMO coefficients" table below. 6

Project	a_b	b_b	c_b	d_b
Organic	2.4	1.05	2.5	0.38
Semidetached	3.0	1.12	2.5	0.35
Embedded	3.6	1.20	2.5	0.32

b) Explain in brief "The Management Spectrum" and its role in Software Development. 6.5

OR

Q5. a) The value of size of program in KLOC and different cost drivers are given below:

Size = 300 KLOC, Complexity = 0.85, Analyst Capability = 1.19, Modern Programming Practices = 0.82 Required Software Reliability = 0.75,

Calculate the effort, development time, average staff size and productivity for the project using COCOMO Model. 6

P.T.O.

Project	a_i	b_i	c_i	d_i
Organic	3.2	1.05	2.5	0.38
Semidetached	3.0	1.12	2.5	0.35
Embedded	2.8	1.20	2.5	0.32

b) Explain Size Estimation Techniques in brief with suitable examples. 6.5

Unit III

Q6. a) Write a short note on Object Oriented Design. 4.5

b) Explain Halstead Software Science Measures for: Program Length, Potential Volume, Program Level and Language Level 8

OR

Q7. a) Explain Data Structure Metrics in brief. 4.5

b) What do you mean by Modularity? Explain Module Cohesion in detail and its relationship with Coupling. 8

Unit IV

Q 8. a) Consider a program to determine whether a number is "odd" or "even" and print the message "Number is EVEN" or "Number is ODD". The no. may be any valid integer in range 1 to 1000. Generate test cases using Boundary Value Analysis Technique and Equivalence class testing technique. 8

b) Write a short note on Configuration Management. 4.5

OR

Q9. a) Consider a program given below for the selection of the largest number 8

```
1  main()
2  {  float a,b,c;
3  printf(" Enter three values\n");
4  scanf("%f%f%f, &a,&b,&c);
5  printf("\n Largest value is");
6  if(a>b)
7  { if(a>c)
8  printf("%f\n",a);
9  else
10 printf("%f\n",c);
11 }
12 else
13 {  if(c>b)
14 printf("%f\n",c);
15 else
16 printf("%f\n",b);
17 }
18 }
```

Draw a flow graph and DD path graph for the above program and find all independent paths. Also check whether all du paths are definition clear or not.

b) Explain Maintenance Process in brief. 4.5

* * * * *

(Please write your Exam Roll No.) Exam Roll No. 06014902012

END TERM EXAMINATION

FOURTH SEMESTER [BCA] MAY-2014

Paper Code: BCA-208 **Subject: Software Engineering (2011 Onwards)**

Time: 3 Hours **Maximum Marks: 75**

Note: Attempt any five question, including Q.no.1 which is compulsory. Select one question from each Unit. Calculator is allowed.

Q1 Answer the following questions:- **(10x2.5=25)**

(a) What is software crisis?
(b) Explain the term 'requirement' in reference to software development.
(c) Why is software development required to be managed?
(d) Discuss the importance of system analysis in brief.
(e) What is a module?
(f) Define software design.
(g) What is the basic need of measurement in software development?
(h) What is risk mitigation?
(i) Define software testing?
(j) How does cost estimation help?

Unit-I

Q2 What is software life cycle? Explain software life cycle model. Write down merits and demerits of various types of software life cycle models. **(12.5)**

Q3 (a) Explain the procedure of drawing a DFD for a software system. **(5)**
(b) How is an SRS organized? Discuss various characteristics of a typical SRS. **(7.5)**

Unit-II

Q4 (a) Who are the major state holders in a software development project? Discuss the role of each. **(6)**
(b) Explain the activities that are undertaken during any typical software project planning. **(6.5)**

Q5 (a) Explain all the five functional units used in FPA. **(5)**
(b) Discuss COCOMO model in detail. **(7.5)**

Unit-III

Q6 Define module coupling and module cohesion. Explain their different types giving examples. **(12.5)**

Q7 Discuss the following:- **(5x2.5=12.5)**
(a) Live Variables (b) Variable Spam (c) Program Weakness
(d) Data structure metric (e) Token Count

Unit-IV

Q8 (a) Explain software testing, test case and test suite with the help of examples. **(6)**
(b) Discuss path testing with the help of suitable illustrations. **(6.5)**

Q9 (a) Discuss the role of graph metrics with the help of some suitable example. **(6)**
(b) What is software maintenance? Discuss various categories of it. **(6.5)**
Also write down the problems faced during the software maintenance.

Adaptive, Corrective, Perfective.

****

(Please write your Exam Roll No.) *Exam Roll No.* .....060.....

END TERM EXAMINATION

FOURTH SEMESTER [BCA] MAY- JUNE 2015

Paper Code: BCA-208 ***Subject: Software Engineering (Batch 2011 onwards)***

Time: 3 Hours ***Maximum Marks: 75***

Note: Attempt any five questions including Q.1 which is compulsory. Select one question from each unit.

Q1 Answer the following question briefly: **(2.5x10=25)**

(a) What do you mean by Protyping?

(b) List out requirements elicitation techniques. Which one is most popular and why?

(c) What is more important: Product or process? Justify your answer.

(d) Differentiate between function point and LOC.

(e) What problem are likely to arise if a module has low cohesion?

(f) What is the importance of language level in Halstead theory of software science?

(g) Discuss the limitations of testing.

(h) What is the difference between Alpha and Beta testing?

(i) What are the various categories of maintenance. Which category consume maximum effort.

(j) Define software Re-Engineering.

Unit-I

Q2. (a) Discuss the prototype model. What is the effect of designing a prototype on the overall cost of the software project. **(6.5)**

(b) Draw 1-level DFD and E-R diagram of hospital management system. **(6)**

Q3. (a) List five desirable characteristics of a good SRS document. Discuss the relative advantages of formal requirement specifications. List the important issues, which an SRS must address. **(6.5)**

(b) Consider the problem of railway reservation system and design the following: **(6)**

(i) Problem statement

(ii) Use case diagram

(iii) Use cases

Unit-II

Q4. (a) What are the various factors of management dependency in software development? Discuss each factor in detail. **(6)**

(b) A project size of 200 KLOC is to be developed. Software development team has average experience on similar type of projects. The project schedule is not very tight. Calculate the effort, development time, average staff size and productivity of the project. Refer "Basic COCOMO coefficients" table below: **(6.5)**

Project	a_b	b_b	c_b	d_b
Organic	2.4	1.05	2.5	0.38
Semidetached	3.0	1.12	2.5	0.35
Embedded	3.6	1.20	2.5	0.32

Q5. (a) Discuss the various types of COCOMO model. Explain the phase wise distribution of effort. **(6.5)**

(b) The value of size of program in KLOC and different cost drivers are given below:

Size=400KLOC, Complexity=0.85, Analyst capability=1.19, Modern in programming Practices=0.82, Required software reliability=0.75 **(6)**
Calculate the effort, development time, average staff size and productivity of the project using COCOMO model.

Project	a_i	b_i	c_i	d_i
Organic	3.2	1.05	2.5	0.38
Semidetached	3.0	1.12	2.5	0.35
Embedded	2.8	1.20	2.5	0.32

Unit-III

Q6. (a) What is modularity? Explain different type of coupling. **(6)**
(b) For a program with number of unique operators n_1=20 and number of unique operands n_2=40, Compare the following.
(i) Program volume (ii) Effort and time
(iii) program length (iv) program level **(6.5)**

Q7. (a) Define Data Structures matrices. How can we calculate amount of data in a program? **(6.5)**
(b) Differentiate between Function oriented design and object oriented design. **(6)**

Unit-IV

Q8. (a) What are the various debugging approaches? Discuss them with the help of examples. **(6)**
(b) Consider a program to determine whether a number is 'odd' or 'even' and print the message NUMBER IS EVEN OR NUMBER IS ODD. The number may any valid integer. Design equivalence class test cases. **(6.5)**

Q9. (a) What is software maintenance? Describe various categories of maintenance. Which category Consumes maximum effort and why? **(6.5)**

(b) Write short note on the following: **(2x3=6)**
(i) Configuration Management
(ii) Documentation

****

(Please write your Exam Roll No.) *Exam Roll No. .....*

END TERM EXAMINATION

FOURTH SEMESTER [BCA] MAY-JUNE 2016

Paper Code: BCA-208 ***Subject: Software Engineering***

Time : 3 Hours ***Maximum Marks :75***

Note: Attempt any five questions including Q.No.1 which is compulsory. Select one question from each unit.

Q1 Answer the following: **(2.5x10=25)**

(a) Explain software crisis.
(b) What is a requirement? What is Requirement Engineering?
(c) What is a context diagram?
(d) Define risk.
(e) Why are metrics required in software engineering?
(f) Explain why are the scaling factors used in the early Design Model of COCOMO?
(g) Discuss the role of coupling in modules.
(h) What is the meaning of debugging?
(i) Differentiate between Alpha and beta testing.
(j) What is software maintenance?

UNIT-I

Q2 Discuss evolutionary and spiral software development life cycle models explicitly highlighting their merits and demerits. **(12.5)**

Q3 Explain requirements elicitation techniques FAST and QFD in detail. **(12.5)**

UNIT-II

Q4 What are ER diagrams used for? Explain various concepts and steps used in the creation of an ER diagram for an information system. **(12.5)**

Q5 Draw level '0', level '1' and level '2' data flow diagrams for the Library management Information System. **(12.5)**

UNIT-III

Q6 What is a software module? What are the advantages of modular softwares? Discuss various types of cohesions that exist in software modules. **(12.5)**

Q7 (a) What is software measurement? Define the term 'software metric'. Highlight various parameters that need to be measured during the software development process. **(6.0)**

(b) Explain Halstead Software Science Measures. **(6.5)**

UNIT-IV

Q8 Take an example program in 'C' for printing out the greatest of the 3 integers that are input by the user. Show all its 'du' paths as well as those 'du' paths that are not 'dc' paths. **(12.5)**

Q9 (a) What is software maintenance? Explain its various types. **(7.5)**

(b) Explain software configuration. What is its significance? **(5.0)**

****

P

(Please write your Exam Roll No.) Exam Roll No. 02314902015

END TERM EXAMINATION

FOURTH SEMESTER [BCA] MAY 2017

Paper Code: BCA-208 **Subject: Software Engineering**

Time: 3 Hours **Maximum Marks: 75**

Note: Attempt any five questions including Q no.1 which is compulsory. Select one question from each unit.

Q1 (a) What is the aim of software engineering? **(10x2.5=25)**
(b) Provide three examples of software projects that would be amenable to the prototyping model.
(c) Describe 'feasibility study'.
(d) What is estimation?
(e) What is the difference between 'Deliverable and 'Milestone'?
(f) What is cyclomatic complexity?
(g) What is the difference between flow chart and structure chart?
(h) Define Data structure metrics.
(i) Differentiate between Alpha and Beta testing.
(j) What is the need for Re-engineering?

UNIT-I

Q2 (a) What is software life cycle? Discuss generic waterfall model. **(6)**
(b) Compare iterative enhancement model and evolutionary enhancement model **(6.5)**

Q3 (a) Draw two level DFD for library management system. **(6)**
(b) Draw E-R diagram library management system. **(6.5)**

UNIT-II

Q4 (a) Describe the role of management in software development with the help of examples. **(4)**
(b) Difference between product, process and project. **(4)**
(c) What are various factors of management dependency in software development? Discuss each factor in detail. **(4.5)**

Q5 (a) Is it possible to estimate software size before coding? If so, how? **(3)**
(b) What are size metrics? How is function point metric advantageous over LOC metric? Explain. **(5)**
(c) What is risk? What are the risk management activities? Is it possible to prioritize the risk? **(4.5)**

UNIT-III

Q6 (a) What are different types of coupling? Give one example of each type. **(4)**
(b) List out the components of 'software Design' document. **(4)**
(c) Discuss different types of object oriented and function oriented design. **(4.5)**

Q7 (a) How does software metric can improve the software process? Enumerate the effect of metric on software productivity. **(4)**
(b) Which one is the most appropriate size estimation technique and why? **(4)**
(c) Define and explain data structure metrics. **(4.5)**

UNIT-IV

Q8 (a) Explain all the steps of cause effect graphing test case design technique with the help of diagram. **(4.5)**
(b) With the help of an example for each, explain following testing- **(8)**
(i) Condition testing
(ii) Loop testing

Q9 (a) What is debugging? Discuss various debugging techniques. **(4.5)**
(b) Discuss various problems during maintenance. Describe some solutions to these problems. **(4)**
(c) Explain boehm's maintenance model with the help of a diagram. **(4)**

****

P

(Please write your Exam Roll No.) Exam Roll No. .....

END TERM EXAMINATION

FOURTH SEMESTER [BCA] MAY 2018

Paper Code: BCA-208 **Subject: Software Engineering**

Time: 3 Hours **Maximum Marks: 75**

Note: Attempt five questions in all including Q.no.1 which is compulsory. Select one question from each unit.

Q1 Answer the following questions briefly: **(2.5x10=25)**

(a) What is software crisis? Was Y2K a software crisis.
(b) Distinguish between generic and customized software product. Which one has larger share of market and why?
(c) What are the characteristics of a good SRS?
(d) Describe any two software size estimation techniques.
(e) Define module cohesion and list down various types of cohesion.
(f) What are the various categories of software metric?
(g) What are the crucial process steps of requirement engineering? Discuss with the help of a suitable diagram.
(h) What are the different levels of testing?
(i) What are the various categories of software maintenance?
(j) What do you mean by Regression testing?.

Unit-I

Q2 (a) Explain the spiral model of software development with the help of a diagram. What are the limitations of such a model? **(5)**

(b) Consider the problem of University Result Management System and design the following: **(7.5)**
(i) Use Case Diagram
(ii) Level-1 DFD
(iii) ER Diagram

Q3 (a) What is facilitated application specification technique (FAST) and compare this with brainstorming sessions. **(2.5)**

(b) List out the merits and demerits of various SDLS models. **(10)**

Unit-II

Q4 (a) What are the risk management activities? Is it possible to prioritize the risk? **(5)**

(b) Compare the Walston-Felix model with the SEL model on a software development expected to involve 8 person-years of effort. **(7.5)**
(i) Calculate the number of lines of source code that can be produced.
(ii) Calculate the duration of the development.
(iii) Calculate the productivity in LOC/PY.
(iv) Calculate average manning.

Q5 (a) Describe the role of management in software development with the help of examples. **(5)**

(b) Suppose that a project was estimated to be 600 KLOC. Calculate the effort, development time, average staff size and productivity for each of the three modes i.e. organic, semidetached and embedded. **(7.5)**

P.T.O.

Project	a_b	b_b	c_b	d_b
Organic	2.4	1.05	2.5	0.38
Semidetached	3.0	1.12	2.5	0.35
Embedded	3.6	1.20	2.5	0.32

Unit-III

Q6 (a) Describe the various strategies of design. Which design is most popular and practical? **(6)**

(b) For a program with the number of unique operators $n_1 = 40$ and number of unique operands $n_2 = 60$, compare the followings: **(6.5)**

(i) Program Volume
(ii) Potential Volume
(iii) Program level
(iv) Program Difficulty
(v) Effort
(vi) Time

Q7 (a) Write a short note on the following terms: **(6)**

(i) Liver variables
(ii) Module weakness

(b) Describe the following terms: **(6.5)**

(i) Objects
(ii) Messages
(iii) Abstraction
(iv) Class
(v) Inheritance
(vi) Polymorphism

Unit-IV

Q8 (a) Discuss the structural testing. How is it different from functional testing? **(6)**

(b) Write a short note on the maintenance process with a suitable diagram. **(6.5)**

Q9 (a) Briefly discuss the following: **(6.5)**

(i) Test case design and test suite
(ii) Verification and Validation
(iii) Alpha, Beta and Acceptance testing

(b) Write short note on the following: **(6)**

(i) Re-engineering
(ii) Reverse Engineering

****

BCA-208
P2/2

6

Exam Roll No. .....

(Please write your Exam Roll No.)

END TERM EXAMINATION

FOURTH SEMESTER [BCA] MAY- JUNE 2019

Paper Code: BCA-208 **Subject: Software Engineering (Batch 2011 onwards)**

Time: 3 Hours **Maximum Marks: 75**

Note: Attempt any five questions including Q.1 which is compulsory. Select one question from each unit.

Q1 Answer all of the following question: **(2.5x10=-25)**

(a) What is debugging and why is it so hard?
(b) Define Data Structure Metrics.
(c) Differentiate between structural and functional testing.
(d) Discuss Feasibility Study and its significance.
(e) What are requirement elicitation techniques? Discuss any one technique in brief.
(f) Differentiate between Software Reverse Engineering and Software Re-Engineering.
(g) What is context diagram? How is it different from Level 1 DFD?
(h) Discuss cyclomatic complexity and its significance.
(i) Discuss various factors of software management dependency.
(j) Discuss various size estimation metrics and their significance.

UNIT-I

Q2 (a) Discuss the organization of good SRS along with its characteristics. **(6)**
(b) Discuss Prototype Model in detail. What are its various issues How is it different from Evolutionary Model. **(6.5)**

Q3 (a) What is the Software Development Life cycle? List various SDLC models. **(6)**
(b) Draw and label and well described Use Case diagram and level 1 DFD for hotel management system. Make assumptions as required. **(6.5)**

UNIT-II

Q4 (a) Discuss COCOMO Model in detail. **(8.5)**
(b) An application has the 10 low external inputs, 12 high external outputs, 20 low internal logical files, 15 high external interface files, 12 averages external inquires, and a value of complexity adjustment factor of 1.10. What are the unadjusted and adjusted function point counts? **(4)**

Q5 (a) Using the Watson-Felix model on a software development expected to involving 8 person-years of effort. **(6)**
(i) Calculate the number of lines of source code that can be produced.
(ii) Calculate the duration of the development.
(iii) Calculate the productivity in LOC/PY
(iv) Calculate the average manning
(b) What is Risk? What are various Risk Management Activities? **(6.5)**

P.T.O.

UNIT-III

Q6 (a) Describe the key features of Object Oriented based software. **(6.5)**

(b) Write a program to find the maximum of three numbers. Find Halstead token count metrics for this program. **(6)**

Q7 Discuss the following:- **(4+4+4.5)**

(a) Module Coupling and its types

(b) Module Cohesion and its types.

(c) Object Oriented Designing

UNIT-IV

Q8 (a) Write short notes on following **(any two):-** **(8)**

1. DD-Path Testing
2. Boundary Value Analysis
3. Cause Effect Graph Testing

(b) Generate all the independent paths required for testing program that finds all even numbers between 1-50. **(4.5)**

Q9 (a) What is software maintenance? Discuss its various categories and issue during maintenance. **(4.5)**

(b) Explain Taute's maintenance model with the help of a diagram. **(4)**

(c) Discuss Configuration Management in software development. **(4)**

****