Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.Tech (CSE)/SEM-6/CS-602/2010

2010

SOFTWARE ENGINEERING

Time Allotted : 3 Hours Full Marks : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following : $10 \times 1 = 10$

i) A physical DFD specifies

a) what processes will be used

b) who generates data and who processes it

c) what each person in an organization does

d) none of these.

ii) Milestones are used to

a) know the cost of the project

b) know the status of the project

c) know user expectations

d) none of these.

iii) Which is NOT a non-functional requirement ?

a) Efficiency b) Reliability

c) Product features d) Stability.

iv) The most desirable form of coupling is

a) Control coupling b) Common coupling

c) Data coupling d) Content coupling.

v) What types of abstraction are used in software design ?

a) Control b) Data

c) Procedural d) All of these.

vi) The chain of activities that determines the duration of the project is the

a) duration path

b) critical path

c) linearly independent path

d) none of these.

vii) What are the three generic phases of software engineering ?

a) Definition, development, support

b) What, how, where

c) Programming, debugging, maintenance

d) Analysis, design, testing.

viii) Which one of the following statements is NOT correct during requirement engineering ?

a) Requirements are difficult to uncover

b) Requirements are subject to change

c) Requirement should be consistent

d) Requirements are always precisely known.

ix) Big Bank Integration testing is useful for projects with

a) smaller number of modules

b) large number of modules

c) average number of modules

d) none of these.

x) To achieve a good design, modules should have

a) weak cohesion and low coupling

b) weak cohesion and high coupling

c) strong cohesion and low coupling

d) strong cohesion and high coupling.

xi) Which is NOT a size measure for software ?

a) LOC

b) Function count

c) Cyclomatic complexity

d) Halstead's program length.

xii) The potential risks are best detected by

a) prototyping model

b) waterfall model

c) incremental model

d) spiral model.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. a) What are the important activities that are carried out during feasibility study phase ? 2

b) Under what circumstances is it beneficial to construct a prototype ? 1

c) Does the construction of a prototype always increase the overall cost of software development ? 2

3. What are different levels of testing and their goals ?

4. A program is expected to have 500 faults. It is also assumed that one fault may lead to one failure only. The initial failure intensity was 2 failures/CPU hr. The program was to be released with a failure intensity objective of 5 failures/100 CPU hr. Calculate the number of failures experienced before release.

5. a) 'Software does not wear out, but hardware does'. Explain. 3

   b) What problems are likely to occur if a module has low cohesion ? 2

6. The size of an organic type software product has been estimated to be 1,00,000 lines of source code. The average salary of software developers is Rs. 10,000/- per month. Determine the effort required to develop the software product, the nominal development time and the cost to develop the product. 2 + 2 + 1

GROUP – C
(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

7. a) Who are the different categories of users of the SRS document ? What are their expectations from the SRS document ? 5

   b) What are the advantages of SRS document ? Why is SRS document known as black box specification of a system ? 3 + 2

   c) What are the different types of team structure followed in software projects ? Discuss them briefly. 5

8. a) Why is intermediate COCOMO expected to give more accurate estimates than the basic COCOMO ? 3

   b) Use a schematic diagram to show the order in COCOMO estimation technique for

      i) cost

      ii) effort

      iii) duration

      iv) size. 3

   c) 'Consider Roxy Roll Centre, a restaurant near College Street, Kolkata, owned by Sourav. Some are convinced that its Egg-Chicken Rolls are the best in College Street. Many people, especially Presidency University students and faculties, frequently eat at Roxy. The restaurant uses an information system that takes customer orders, sends the orders to the kitchen, monitors goods sold and inventory and generates reports for management.'

      Draw the context diagram and Level 1 DFD for the Roxy's food ordering system. Also draw a Level 2 DFD that will show the decomposition of any one process from Level 1 DFD. 2 + 4 + 3

9. a) What are the differences between fault, failure and error ? 3

b) Write a *C* function to find the maximum of three integer numbers. Now draw the control flow graph for that *C* function. Also find its cyclomatic complexity using possible methods. 1 + 2 + 3

c) Write down two differences between a structure chart and a flow chart. 2

d) Distinguish between high-level and detailed designs. What documents should be produced on completion of high-level and detailed designs respectively ? 2 + 2

10. a) Write down three advantages of decision trees over decision tables. 3

b) Mention two situations when decision tables work best. 2

c) A bank has decided to adopt the following policy on deposits :

'On deposits of Rs. 5,000 and above and for three years or above the interest is 10%. On the same deposit for a period less than 3 years it is 8%. On deposits below Rs. 5,000 the interest is 6% regardless of the period of deposit.'

Develop a decision tree and decision table for the above process. Also express the above policy using structured English. 2 + 2 + 2

d) Distinguish between physical DFD and logical DFD with an example each. 4

11. a) The following table specifies various tasks involved in completing a software project :

Notation	*Activity*	*Duration (Weeks)*	*Precedents*
A	Hardware Selection	6	
B	Software Design	4	
C	Install Hardware	3	A
D	Code & Test Software	4	B
E	File Take-on	3	B
F	Write user manuals	10	
G	User training	3	E, F
H	Install & test system	2	C, D

Draw an activity network representation for the project and then identify the critical path on the network drawn. Also draw Gantt chart representation for the project. 3 + 1 + 3

b) Explain when you should use PERT charts and when you should use Gantt charts while you are performing the duties of a project manager. 3

c) What are 'baselines' in relation to Software Configuration Management ? 3

d) What do you mean by CASE ? 2