50. The following pseudocode accepts three numbers, a, b and c, interprets those numbers as the lengths of the sides of a triangle and outputs the type of the triangle.

```
read a, b, c;
type = "scalene" ;
if (a = = b || b = = c || a = = c)
        type = "isosceles" ;
if (a = = b & & b = = c)
        type = "equilateral" ;
if (a > = b + c || b > = a + c || c > = a+b)
        type = "not a triangle" ;
if (a < = 0 || b < = 0 || c < = 0)
        type = "bad inputs" ;
print type ;
```

a) Draw a control-flow graph for the above code. The first three times of the cose may be merged into a single node. 2

b) Choose sets of inputs in such a manner that every arc of the graph is tested at least once. The number of sets should be as small as possible. Prepare a table showing the arcs tested for each set. 8

BACHELOR OF ENGINEERING IN COMPUTER SCIENCE & ENGINEERING EXAMINATION, 2012

(2nd Year, 2nd Semester)

SOFTWARE ENGINEERING

Time : Three Hours Full Marks - 100

Group - A

Match the correct pairs :

	Set - I		Set - II
1.	Basis path	i)	is - a
2.	Big-endian / little-endian	ii)	large amount of data
3.	Concurrent development model	iii)	many simultaneous requests
4.	Deprecating	iv)	modularity, generality, expandability, self-descriptiveness
5.	Flexibility	v)	non-functional requirement
6.	Generalization	vi)	optional functionality
7.	Hooks	vii)	obsolescence
8.	Interoperability	viii)	portability
9.	Operability	ix)	product transition quality factor

	Set - I		Set - II
10.	Simplicity	x)	series of events
11.	Stability	xi)	the better it works the more efficiently it can be tested
12.	Stress testing	xii)	the fewer the changes the fewer the disruptions to testing
13.	Throughput	xiii)	the less there is to test, the more quickly we can test it
14.	Usability testing	xiv)	white-box
15.	Volume testing	xv)	user's expectation

15x2=30

Group - B

Answer any 15 :

Fill in the blanks :

16. A component is any piece of software or hardware that has a clear role and can be _____, allowing us to replace it with a different component with equivalent _____.

17. A _____ _____ is a detailed description of the steps involved in performing a use case and describes sequences of observable behaviour.

Group - D

Answer all questions

49. Consider the following job log :

Task	Estimated effort (Programmer - days	Actual effort so far (Programmer - days	Estimated completion date	Actual date of completion
1	50	70	15.01.11	01.02.11
2	35	20	15.02.11	15.02.11
3	20	40	25.02.11	01.03.11
4	40	40	15.04.11	01.04.11
5	60	10	01.06.11	____
6	80	20	01.07.11	____

Assume that the current date is 01.05.11.

a) Calculate BCWS, BCWP, ACWP, earned value, schedule variance, and cost variance. 8

b) Is the project on schedule? 2

46. The software quality factor related to access control and access audit is

a) reliability
b) integrity
c) testability
d) none of the above

47. To build flexibility into a design, we should

a) increase coupling
b) reduce cohesion
c) hard-code constants
d) none of the above

48. UML is a

a) visual programming language
b) tool specification
c) process
d) language

10x2=20

18. An activity diagram consists of _____ and _____.

19. A _____ _____ simulates the part of the system that calls the component under test.

20. A subsystem is a system that is part of a _____ system and which has a definite _____.

21. In order to create abstractions, we should try to create _____ or superclasses with _____ operations.

22. In order to ensure that the system can be adopted in the future, we should describe _____ that are _____ for subsequent releases.

23. In the spiral model, each of the _____ activities represents one _____ of the spiral path.

24. _____ _____ is achieved when operations that are performed during the same phase of the execution of the program are kept together, and everything else is kept out.

25. _____ _____ is the heart of quality control.

26. One of the strong points of the object-oriented paradigm is that it helps ensure _____ cohesion.

27. _____ requirements are constraints that must be adhered to during development. They limit what _____ can be used.

28. Test planning can begin as soon as the _____ _____ is complete.

29. The focus of the FTR is on a _____ _____.

30. The main deliverable of the Domain Analysis phase is the _____ model, which consists of class programming abstractions related by _____.

31. The most important way to design defensively is to check that all of the _____ to a component are valid, i.e. to check the _____ of each component.

32. The Rapid Application Development (RAD) is an _____ software process model that emphasizes a development cycle.

33. Traceability establishes traces among the _____ of activities of the _____ phase and validates them against user requirements.

34. UML applies to _____ and _____.

35. Unlike other process models that end when software is delivered, the _____ model can be adapted to apply throughout the _____ of the computer software. 15x2=30

b) Communicational cohesion
c) Layer cohesion
d) Temporal cohesion

43. The following system testing activity involves tests of common functionality among a selected group of end users in the target environment :
a) Pilot testing
b) Installation testing
c) Acceptance testing
d) Performance testing

44. The following risk threatens the viability of the software to be built :
a) Business risk
b) Project risk
c) Technical risk
d) none of the above

45. The missing parts of a framework are called
a) modules
b) plugs
c) slots
d) jacks

Group - C

Answer any 10 :

Choose the unique correct answer.

36. Activity Diagrams are deliverables of
    a) Subsystem Analysis
    b) Domain Analysis
    c) Requirements Analysis
    d) None of the above

37. A use case model is a
    a) specification model
    b) design model
    c) object model
    d) subsystgem model

38. If L is the member of source statements, P is a productivity parameter, t is the project duration in calendar months, and E is the development effort in person-months, then
    a) $E = L^4 / (P^4 t^3)$
    b) $E = L^3 / (P^3 t^4)$
    c) $E = L^3 / (P^3 t^3)$
    d) none of the above

39. If the requirements can be defined early in the cycle, we can use the
    a) Prototype model
    b) Spiral model
    c) Incremental model
    d) none of the above

40. Integrity is a
    a) Product Transition Quality factor
    b) Product Revision Quality factor
    c) Product Operation Quality factor
    d) none of the above

41 In a CPM activity-on-node network, a particular node W has three immediately preceding activities X, Y, and Z. The earliest start date of W is the
    a) earliest of the latest finishing dates of X, Y, Z.
    b) latest of the earliest finishing dates of X, Y, Z.
    c) earliest of the earliest finishing dates of X, Y, Z.
    d) latest of the latest finishing dates of X, Y, Z.

42. Procedural cohesion is more important than
    a) Sequential cohesion