Ref. No.:EX/CSE/T/411A/2018

B.E. COMPUTER SCIENCE AND ENGG. 4th YR 1st SEM. Exam.-2018

SOFTWARE ENGINEERING

Time: Three Hours **Full Marks:100**

GROUP-A

Answer all questions 40×2=80

Choose the unique correct answer.

1. In order to overcome human cognitive limitation, Software Engineering adopts the principles of
(a) abstraction
(b) decomposition
(c) both abstraction and decomposition
(d) none of the above

2. Software Engineering employs
(a) past experience
(b) provable principles only
(c) unique solutions as opposed to several alternate solutions
(d) subjective judgment

3. When the development team has very little knowledge of the technical issued involved, the appropriate life-cycle model is
(a) RAD
(b) Prototyping
(c) Waterfall
(d) Spiral

4.The life-cycle model suitable for customized software (developed for one or two customers by adapting an existing software) is
(a) RAD
(b) Prototyping
(c) Waterfall
(d) Spiral

5. In each phase of the spiral model, the second quadrant involves
(a) development of next-level product
(b) determination of objectives, alternatives, and constraints
(c) evaluation of alternatives and risk management
(d) planning of next phase

For Q6..Q8: Function-Point Estimation in a particular software development project generated the following parameters:

- No. of external outputs = { 12 (optimum), 15 (likely), 22 (pessimistic) }
- Raw function point count ("count total") = 320
- Sum of the Value Adjustment Factors = 52
- The external outputs are classified as having an "average" weighting factor (as opposed to simple or complex)

6. The estimated count (rounded) for the number of external outputs is
(a) 14
(b) 15
(c) 16
(d) 17

7. The contribution of the no. of external outputs to the raw function point count is
(a) 64
(b) 78
(c) 112
(d) 150

8. The complexity adjustment factor is
(a) 0.1
(b) 0.52
(c) 0.65
(d) 1.17

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9. Project scheduling is indispensable because
(a) tasks are not predefined
(b) many software engineering tasks proceed in parallel
(c) some tasks may face unknown difficulties
(d) resource requirements are unpredictable

10. One of the primary objectives of the critical path method is
(a) to plan the project in such a way that it is completed as quickly as possible
(b) to convert a sequential schedule to a parallel schedule
(c) to estimate the development effort in person-months
(d) none of the above

11. Earliest start dates are computed
(a) by determining the critical path
(b) during the backward pass
(c) during the forward pass
(d) by computing floats

12. When an activity A has more than one immediately preceding activity, the earliest start date for A is
(a) earliest of the earliest finish dates of those activities
(b) latest of the latest finish dates of those activities
(c) earliest of the latest finish dates of those activities
(d) latest of the earliest finish dates of those activities

13. When an activity B has more than one activity that can commence immediately after B is complete, the latest finish date for B is
(a) latest of the earliest start dates of those activities
(b) earliest of the latest start dates of those activities
(c) latest of the latest start dates of those activities
(d) earliest of the earliest start dates of those activities

14. The float of an activity is
(a) latest start date – earliest start date
(b) latest finish date – earliest start date
(c) earliest finish date – latest start date
(d) none of the above

15. The completion date of a project will be delayed if
(a) any activity is delayed
(b) each and every activity is delayed
(c) a critical activity is delayed
(d) none of the above

16. An activity in a PERT network has a duration of 8 weeks (optimistic), 10 weeks (most likely), or 15 weeks (pessimistic). Its expected duration is
(a) 11 weeks
(b) 10.5 weeks
(c) 19.72 weeks
(d) none of the above

17. In the embedded mode of the basic COCOMO model, the project cost LM is given by
(a) $2.4 \times (\text{KSLOC})^{2.5}$
(b) $2.5 \times (\text{KSLOC})^{0.38}$
(c) $2.5 \times (\text{KSLOC})^{0.32}$
(d) $3.6 \times (\text{KSLOC})^{1.20}$

18. Consider the following code fragment:

If a and b then

The two tests

- a = True, b = False; and
- a = True, b = True

ensure

(a) Statement coverage
(b) Branch coverage
(c) Condition coverage
(d) Path coverage

19. Refer to the code in Q18. The two tests

- a = True, b = False; and
- a = False, b = True

ensure

(e) Statement coverage
(f) Branch coverage
(g) Condition coverage
(h) Path coverage

20. Two basis paths (independent paths)
(a) must not have any common edge
(b) must involve an edge that belong to one and only one of them
(c) must have all nodes common
(d) none of the above

21. The cyclomatic complexity V(G) of a control flow graph G
(a) gives a lower bound on the number of independent paths
(b) gives an upper bound on the number of independenyt paths
(c) is exactly equal to the number of independent paths
(d) none of the above

22. Errors at module interfaces are tested in
(a) White-box testing
(b) Stress testing
(c) Integration testing
(d) Unit testing

23. A major weakness of big-bang testing is that
(a) it is very difficult to localise a detected error
(b) it requires stubs and drivers
(c) it requires a huge amount of disk space
(d) none of the above

24. The disadvantage of top-down testing is that
(a) user interface components are tested late
(b) test drivers are needed
(c) test stubs are needed
(d) none of the above

25. A criterion used in determining equivalence classes for equivalence testing is that every possible input belongs to one of the equivalence classes. This is termed
(a) Soundness
(b) Disjointedness
(c) Representation
(d) Coverage

26. The test which checks if the system can respond to many simultaneous requests is
(a) Security testing
(b) Stress testing
(c) Timing testing
(d) Volume testing

27. The subsection of an SRS which relates the product to other products or projects is
(a) Overview
(b) General Constraints
(c) Product Function
(d) Product Perspective

28. The subsection of SRS that describes required screen formats is
(a) User Interfaces
(b) Software Interfaces
(c) Communication Interfaces
(d) none of the above

29. Use of other required software products (e.g. a data management system, an operating system, or a mathematical package) are described in the following subsection of an SRS:
(a) User Interfaces
(b) Hardware Interfaces
(c) Software Interfaces
(d) Communication Interfaces

30. The subsection of an SRS which discusses the number of files and records to be handled is
(a) Quality Characteristics
(b) Design Constraints
(c) External Interface Requirements
(d) Performance Requirements

31. A module that updates a database
(a) is functionally cohesive
(b) is NOT functionally cohesive

32. In order to achieve layer cohesion
(a) lower layers must not access higher layers
(b) higher layers can access lower layers
(c) both (a) and (b)
(d) layers must NOT form a hierarchy

33. A type of cohesion is achieved when modules that access or manipulate certain data are kept together (e.g. in the same class) and everything else is kept out. This is
(a) Utility cohesion
(b) Sequential cohesion
(c) Procedural cohesion
(d) Communicational cohesion

34. A type of cohesion is achieved when a series of procedures, in which one procedure provides input to the next, are kept together- and everything else is kept out. This is
(a) Communicational cohesion
(b) Functional cohesion
(c) Sequential cohesion
(d) Procedural cohesion

35. It is hard to understand or change a system if it is
(a) tightly coupled
(b) loosely coupled

36. Flexibility can be built into a design by
(a) reducing coupling
(b) increasing cohesion
(c) creating abstractions
(d) all of the above

For Q37-Q38: Consider McCall's Quality Factors.

37. The extent to which a program can be expected to perform its intended function with required precision is called
(a) Correctness
(b) Integrity
(c) Reliability
(d) Usability

38. The extent to which a program can be used in other applications is called
(a) Reusability
(b) Interoperability
(c) Portability
(d) Flexibilty

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39. An important design principle is to ensure that all the functionality of the code can be executed without going through the graphical user interface. This principle is termed
(a) Design for flexibility
(b) Design for portability
(c) Design defensively
(d) Design for testability

40. Reusabilty can be increased by
(a) simplifying the design as much as possible
(b) reducing coupling
(c) increasing abstraction
(d) all of the above

GROUP-B

41. 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. 16

(b) Is the project on schedule ? 4

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