

BCSE Examination 2014 (2nd year, 2nd Semester)

Software Engineering

Time: Three Hours

Full Marks:100

Group-A

Match the correct pairs.

16*3=48

SET-I

1. Baseline budget
2. COCOMO
3. Communicational Cohesion
4. Component
5. Constituents of a package
6. Cutoff line language level
7. Earned Value
8. FTR
9. Interdependences
10. Large-scale systems
11. Layer cohesion
12. Module
13. Requirements are fuzzy
14. Systematic, sequential approach
15. Uncertainty and loss
16. Zero-float

SET-II

- (i) API
- (ii) BCWP
- (iii) BCWS
- (iv) Boehm
- (v) classes
- (vi) component defined at the programming-
- (vii) critical activity
- (viii) object-oriented paradigm
- (ix) Project scheduling
- (x) Prototyping model
- (xi) quality control
- (xii) replaceable
- (xiii) risk
- (xiv) risk table
- (xv) Spiral model
- (xvi) Waterfall model

Group-B

10*3=30

Answer any ten.

Choose the unique correct answer.

17. If requirements change often in the cycle, we can use the
 - (a) Incremental model
 - (b) Prototype model
 - (c) RAD model
 - (d) Waterfall model
18. If the project manager does not closely track the team's progress, we can use the
 - (a) Incremental model
 - (b) RAD model
 - (c) Spiral model
 - (d) Waterfall model
19. Inquiries
 - (a) use many keys
 - (b) include operations or calculations on data
 - (c) use simple keys
 - (d) none of the above
20. The project cost (estimated labour months) is given by $LM = 3.0 * (KSLOC)^{1.12}$ in the
 - (a) Organic mode
 - (b) Semidetached mode
 - (c) Embedded mode
 - (d) all of the above

21. If a =optimistic duration, b = pessimistic duration, and m =most-likely duration, the expected duration t_e is

- (a) $(a+4b+m)/6$
- (b) $(b+4a+m)/6$
- (c) $(a+4m+b)/6$
- (d) none of the above

22. In McCall's methodology, usability is a

- (a) product operation quality factor
- (b) product revision quality factor
- (c) product transition quality factor
- (d) all of the above

23. In McCall's methodology, flexibility is a

- (a) product operation quality factor
- (b) product revision quality factor
- (c) product transition quality factor
- (d) all of the above

24. The software quality criteria of consistency, simplicity, conciseness, modularity, and self-descriptiveness are associated with

- (a) Reliability
- (b) Integrity
- (c) Portability
- (d) Maintainability

25. A requirement

- (a) need not be reviewed by all stakeholders
- (b) describes the domain
- (c) must describe how the system will be implemented
- (d) says something about the tasks the system is supposed to accomplish

26. If facilities for operating on the same data are kept together, we achieve

- (a) functional cohesion
- (b) communicational cohesion
- (c) procedural cohesion
- (d) utility cohesion

27. An example of a functionally cohesive module is one which

- (a) has side-effects
- (b) updates a database
- (c) solves a set of equations
- (d) creates a new file

28. Reusability can be increased by

- (a) increasing cohesion
- (b) increasing coupling
- (c) decreasing abstraction
- (d) avoiding hooks

29. Flexibility can be built into a design by

- (a) avoiding interfaces or superclasses with polymorphic operations
- (b) avoiding reusable code
- (c) increasing coupling
- (d) increasing cohesion

Answer all questions

Group-C

30. A project began on 01 January. Its progress is detailed below.

Milestone	Completion Date		Cost	
	Planned	Actual	Planned	Actual
A	01 Feb	20 Jan	15,000	10,000
B	01 March	28 Feb	20,000	15,000
C	01 April	05 April	25,000	25,000
D	01 May		20,000	10,000
E	01 June		15,000	
F	01 July		5,000	
Totals			100,000	60,000

Consider the status of the project on 01 May.

- Calculate BCWS, BCWP, and ACWP on 01 May.
- Calculate Cost Variance and Schedule Variance.
- Comment on the condition of the project.

6
4
1

31. Consider the following pseudocode:

```

if a
then b
else begin
    if d then c else e;
    f
end
g.

```

1

(a) Draw a flowchart for this program.

(b) Draw a directed graph G corresponding to this flowchart. A node of G represents either a decision-box or a block of sequential statements. Determine the in-degree and out-degree of each node.

1

(c) Find the equivalence classes in G. An equivalence class consists of nodes having the same in-degree and out-degree.

2

(d) Let n be the total number of nodes in G. For each equivalence class k, compute the entropy

$$H_k = -(1/n) \log_2 (C_k/n)$$

where C_k is the number of nodes in equivalence class k.

Then compute the total entropy

$$H_G = \sum_{k=1}^c H_k$$

where c is the number of equivalence classes.

2

(e) Compute the total entropy H_J for the following pseudocode:

4

```

if a
then b else c;
if d then e else f;
g.

```

(f) Compare H_G and H_J . Which pseudocode has higher diversity of structure and how is it related to its entropy?

1

-END-