



UNIVERSITY OF COLOMBO, SRI LANKA

UNIVERSITY OF COLOMBO SCHOOL OF COMPUTING

DEGREE OF BACHELOR OF INFORMATION TECHNOLOGY (EXTERNAL)

Academic Year 2013/2014 – 2nd Year Examination – Semester 3

IT3204: Software Engineering I

PART I – Multiple Choice Question Paper

01st March 2014

(ONE HOUR)

Important Instructions:

- The duration of the paper is **1 (one) hour**.
- The medium of instruction and questions is English.
- The paper has **25** questions and **5** pages.
- All questions are of the MCQ (Multiple Choice Questions) type.
- All questions should be answered.
- Each question will have 5 (five) choices with **one or more** correct answers.
- All questions will carry equal marks.
- There will be a penalty for incorrect responses to discourage guessing.
- The mark given for a question will vary from 0 (*All the incorrect choices are marked & no correct choices are marked*) to +1 (*All the correct choices are marked & no incorrect choices are marked*).
- Answers should be marked on the special answer sheet provided.
- Note that questions appear on both sides of the paper.
If a page is not printed, please inform the supervisor immediately.

Mark the correct choices on the question paper first and then transfer them to the given answer sheet which will be machine marked. **Please completely read and follow the instructions given on the other side of the answer sheet before you shade your correct choices.**

Consider the following description and answer the questions 1 to 15 which follow.

Suppose you are working in a software engineering team which has been assigned the task of modifying an operating system to run in a multiprocessor environment. Suppose also that the processor manufactures have precisely given you the necessary specifications to develop the new operating system. This new multiprocessor operating system must perform tasks such as task allocation among the processors, memory management and conflict resolution. The project manager has stressed that the performance of the operating system will be crucial to utilize the processors in an optimal way. The system is planned to be marketed early next year for a PC manufacturer. Before that, the new operating system will be given to a selected user group inside the developing company for testing. The interface of the operating system will be the same as the previous single processor version and only the kernel will be affected by the proposed modifications. As such, the project manager has turned down a request to train staff to work with the new version of the operating system.

1) Which of the following types of software best describe the above system?

- (a) business software and system software
- (b) customized software and system software
- (c) generic software and web-based software
- (d) customized software and safety critical software
- (e) application software and customized software

2) Based on the information given, which of the following is/are the most important quality attribute(s) that the system must possess from among the following if it were to host financial applications?

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|---------------------|----------------|
| (a) portability | (b) accuracy |
| (c) security | (d) efficiency |
| (e) maintainability | |

3) Which of the following process model(s) is/are suitable for the development of the above system?

- (a) waterfall model
- (b) rational unified process model
- (c) evolutionary prototyping
- (d) rapid application development
- (e) SCRUM

4) Select the most likely language which would be used for the development of the new operating system from among the following?

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|------------|------------|
| (a) Python | (d) Prolog |
| (b) C | (e) Scheme |
| (c) Java | |

5) Which of the following is/are the most suitable requirement gathering technique(s) to capture the requirements of the system?

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|-----------------------|-----------------|
| (a) questionnaire | (b) observation |
| (c) document analysis | (d) prototyping |
| (e) usability study | |

- 6) Which of the following is a/are stakeholder(s) of the system?
- | | |
|---------------------|-----------------------------|
| (a) PC manufacturer | (b) Processor manufacturers |
| (c) Trainers | (d) Team members |
| (e) Project Manager | |
- 7) Which professional skills do you think you must have to do this project as a member of a software development team?
- | | | |
|-------------------------------|----------------------|----------------------------|
| (a) project management skills | (b) writing skills | (c) problem solving skills |
| (d) presentation skills | (e) listening skills | |
- 8) Which architectural model(s) best suit(s) the design of the new operating system?
- | | | |
|-------------------------|---------------------|------------------------|
| (a) repository model | (b) waterfall model | (c) peer to peer model |
| (d) client-server model | (e) spiral model | |
- 9) Which of the following is a/are functional requirement(s) of the system?
- | |
|---------------------------------------|
| (a) Task allocation among processors |
| (b) Resolving conflicts |
| (c) Optimal utilization of processors |
| (d) Efficient performance |
| (e) Memory management |
- 10) The whole project can be considered as a type of maintenance applied to the older version of the operating system. What is that type of maintenance?
- | | | |
|----------------------------|----------------------------|----------------------------|
| (a) preventive maintenance | (b) corrective maintenance | (c) perfective maintenance |
| (d) after sales service | (e) adaptive maintenance | |
- 11) Which of the following testing technique(s) the development company plans to adopt to test the software once development is done?
- | | | |
|-----------------------|------------------------|----------------------|
| (a) alpha testing | (b) regression testing | (c) code walkthrough |
| (d) white box testing | (e) beta testing | |
- 12) Which of the following notation(s) you think best suit(s) the modeling of the new kernel routines?
- | | | |
|------------------------|----------------------------------|----------------|
| (a) Data flow diagrams | (b) State transition diagrams | (c) Flowcharts |
| (d) Class diagrams | (e) Entity relationship diagrams | |
- 13) Which of the following should be a duty/duties of the project manager with respect to managing this project?
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| (a) choosing an appropriate language for the project |
| (b) estimating project costs |
| (c) gathering requirements from the processor manufacturers |
| (d) thinking about the risks the project can face |
| (e) choosing the correct process model for the project |

- 14) What would be the most appropriate term(s) which may be used to describe the new operating system?
- | | | |
|-------------|-------------------|-------------|
| (a) version | (b) configuration | (c) release |
| (d) variant | (e) sprint | |
- 15) What do you think is/are the technique(s) to be used if this operating system is difficult to be maintained further within a reasonable budget?
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|------------------------------|---------------------|
| (a) configuration management | (d) re-engineering |
| (b) static analysis | (e) risk mitigation |
| (c) inspections | |
- 16) Which of the following is a/are proper ordering(s) of the stages of the Capability Maturity Model (CMM) of process quality?
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|--|
| (a) initial, repeatable, defined, managed, optimized |
| (b) repeatable, defined, managed, initial, optimized |
| (c) initial, defined, repeatable, managed optimized |
| (d) initial, defined, managed, repeatable, optimized |
| (e) defined, initial, repeatable, optimized, managed |
- 17) Which of the following aspect(s) need(s) to be considered when choosing a programming language for a project?
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|------------------------------------|-------------------------------------|----------------------------------|
| (a) conceptual model of the design | (b) availability of design patterns | (c) availability of stakeholders |
| (d) type system | (e) language expertise | |
- 18) Which of the following is a/are true statement(s) with respect to software quality management?
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|---|
| (a) Quality assurance is concerned with establishing quality criteria within a company. |
| (b) Quality control checks whether the team follows the specified standards. |
| (c) Quality management starts at the very beginning of the software lifecycle and can be considered an 'umbrella' activity. |
| (d) Quality checking can be applied at each milestone of the lifecycle to each deliverable. |
| (e) Quality planning is selecting company standards to be applied for a project. |
- 19) Which of the following testing technique(s) can be used to check undefined variables when code cannot be interpreted?
- | | | |
|---------------------|-----------------------|-----------------------|
| (a) inspections | (b) black box testing | (c) white box testing |
| (d) dynamic testing | (e) code walkthrough | |
- 20) Which of the following interaction style/technology best suit the development of a surgical simulation and hands free word processor respectively?
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|--------------------------------------|--------------------------------------|---|
| (a) direct manipulation and keyboard | (b) command-line and virtual reality | (c) direct manipulation and voice recognition |
| (d) virtual reality and touchpad | (e) GUI and direct manipulation | |

21) Common design elements called design patterns can be used when designing software. Which of the following is a/are advantage(s) of using design patterns?

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|---------------------------|------------------------|-------------------------------|
| (a) high reliability | (b) minimal cost | (c) automatic static analysis |
| (d) promote best practice | (e) enhanced usability | |

22) Which of the following statement(s) is/are correct with respect to software maintenance?

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| (a) The use of design patterns has no effect on maintainability. |
| (b) The reliability of software may decrease as more and more maintenance is done. |
| (c) Corrective maintenance absorbs most of the costs of maintenance. |
| (d) Maintaining legacy systems is a key challenge of software engineering. |
| (e) CASE tools can help to manage software change in a methodological way. |

23) Suppose you are to perform a black box test on a procedure which takes 2 ordered lists of non-negative integers of length 5 and merges them to create another ordered list. If you were to check the input handling of this procedure, what is/are the equivalence class(es) you would consider from among the following?

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|---|
| (a) an empty list: [] |
| (b) a list of more than 5 ordered non-negative integers: [1, 2, 3, 4, 5, 6] |
| (c) a list of negative integers: [-1, -2, -3, -4, -5] |
| (d) a list of strings [qwerty, asdf, zxcv, abcdefg] |
| (e) a list of real values: [1.23, 4.768, 0.005] |

24) Suppose you have been asked to write a JAVA program before being appointed as a software engineer. Which of the following is a/are good programming practice(s) you will exhibit in your program?

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| (a) having a very high fog index |
| (b) writing less complex code |
| (c) inclusion of pre-conditions and post-conditions |
| (d) use of arrays instead of linked lists |
| (e) indentation of logically distinct sections |

25) Which of the following is a/are correct statement(s) with respect to module coupling?

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|---|
| (a) Common coupling occurs when modules access the same global data area. |
| (b) Coupling is a measure of the strength of the interconnections between software modules. |
| (c) In data coupling, the complete data structure is passed from one module to another. |
| (d) Functional coupling occurs when all the elements of the module combine to complete one specific function. |
| (e) Logical coupling occurs when functionality is grouped by type so that they are logically related. |
