HERITAGE CHRISTIAN COLLEGE
BSC INFORMATION TECHNOLOGY
DEPARTMENT OF INFORMATION TECHNOLOGY

End of Semester Examination
2021/2022 ACADEMIC YEAR SEMESTER ONE
JUNE, 2022

SOFTWARE ENGINEERING
HINT 3318

Instruction to candidates
This paper is divided into five (5) Sections: A, B, C, D & E. Read all instructions carefully before you attempt the questions.

Time Allowed:
2 Hours, 15 Minutes
Total Marks: 100

Section A – Answer only one (1) question from this section

1. The stage in the SDLC during which the system is actually built or in the case of a packaged software, purchased and installed.
   a. Planning
   b. Testing
   c. Implementation
   d. Design

2. Statements that define and qualify what a software program needs to do are _____
   a. tasks
   b. actions
   c. requirements
   d. activities

3. The highest-ranking executive who supports a software project is often called a _____
   a. Project manager
   b. System analyst
   c. Executive sponsor
   d. Finance manager

4. Which type of requirement statement defines what the program needs to do?
   a. Functional requirement
   b. Design constraint
   c. Non-functional requirements
   d. System requirements

5. An object node _____.
   a. Is used to stop all control flows and object flows in an activity (or action).
   b. Is used to represent an object that is connected to a set of object flows.
   c. Is used to bring back together different decision paths that were created using a decision node.
   d. Is used to split behavior into a set of parallel or concurrent flows of activities (or actions).

6. _____ is software that resides directly within some hardware component in order to provide control over the component or other vital features required for it to function.
   a. Application software
   b. Embedded software
   c. Scientific software
   d. System software

7. Which of the following is not an actor in a JAD session?
   a. A sponsor
   b. A tester
   c. A scribe
   d. A user

8. A circled black circle in an activity diagram represents _____.
   a. the start
   b. a decision
   c. the end
   d. the start or end of concurrent activities

9. What type of testing refers to testing done by the clients (or somebody on their behalf) to make sure the program runs as specified?
   a. Black-box testing
   b. Unit testing
   c. Regression testing
   d. User acceptance testing

10. Correctness as an attribute of a quality software is _____.
    a. the degree to which the software performs its required function.

b. the ability to withstand attacks (both accidental and intentional) to its security.
c. the physical and or intellectual skill required to learn the system
d. the ability to interact properly with other systems

11. A/an _____ diagram illustrates in a very simple way the main functions of the system and the different kinds of users that will interact with it.
    a. activity
    b. network
    c. use case
    d. data flow

12. In requirements elicitation, an interviewer asks _____ questions to follow up on what has just been discussed in order to learn more, and to get clarity on what's unclear about an interviewee's answer.
    a. rebuttal
    b. probing
    c. open-ended
    d. close-ended

13. Techniques used for feasibility analysis in software projects include all of the following except _____.
    a. Technical
    b. People
    c. Organizational
    d. Economic

14. The _____ phase of the SDLC decides how the system will operate in terms of the hardware, software, and network infrastructure that will be in place; the user interface, forms, and reports that will be used; and the specific programs, databases, and files that will be needed.
    a. design
    b. requirement gathering
    c. planning
    d. testing

15. Software Quality can be considered in terms of user satisfaction which includes _____.
    a. delivery within budget and schedule
    b. a compliant product
    c. good quality output
    d. all of the above

16. Determining how many people should be assigned to a project, matching people's skills with the needs of the project, motivating them to meet the project's objectives, and minimizing project team conflict that will occur over time are all activities under _____.
    a. project estimation
    b. resource management
    c. scope management
    d. risk management

17. This describes the major pieces of the application and how they interact.
    a. Wrap up
    b. Maintenance
    c. Development
    d. High-level design

18. All of the following are true for a context diagram except _____.
    a. All process models have one context diagram
    b. the context diagram shows the entire system in context with its environment.
    c. The stick figures on the diagram represent actors.
    d. A context diagram isn't complete without data stores.

19. Regardless of application area, project size, or complexity, software development work may be divided into three generic phases: the_____ phase, which focuses on what, the_____ phase, which focuses on how, and the_____ phase, which focuses on change.
    i. support
    ii. development
    iii. definition
    a. iii, i, ii
    b. i, ii, iii
    c. iii, ii, i
    d. ii, i, iii

20. All of the following are software quality attributes except _____.
    a. Size
    b. Correctness
    c. Reusability
    d. Maintainability

21. CASE stands for
    a. Computer-Aided Software Engineering
    b. Control Aided Science and Engineering
    c. Cost Aided System Experiments
    d. None of the above

22. A requirement elicitation technique that allows the project team, users, and management to work together to identify requirements for the system is known as _____.
    a. interview
    b. document analysis
    c. questionnaires
    d. joint application development

23. In an activity diagram, this node is used to represent a test condition to ensure that the control flow or object flow only goes down one path.
    a. Object node
    b. Decision node
    c. Merge node
    d. Initial node

24. Risk management is one of the most important jobs for a _____
    a. client
    b. investor
    c. production team
    d. project manager

25. _____ refers to a technique that sets a fixed deadline for a project and delivers the system by that deadline no matter what, even if functionality needs to be reduced.
    a. Task orientation
    b. Timeboxing
    c. Snowballing
    d. Time orientation

26. Which of the following risk is the failure of a purchased component to perform as expected?
    a. Product risk
    b. Project risk
    c. Business risk
    d. Programming risk

27. A _____ is a horizontal bar chart that shows the same task information as the project work plan, but in a graphical way.
    a. resource histogram
    b. PERT chart
    c. flow chart

d. Gantt chart

28. The activity that distributes estimated effort across the planned project duration by allocating the effort to specific software development tasks is _____
    a. Reverse engineering
    b. Project staffing
    c. Project scheduling
    d. Software re-engineering

29. Which UML diagram portrays the primary activities and the relationships among activities in a process?
    a. Network diagram
    b. Activity diagram
    c. Use-case diagram
    d. A Level 0 DFD diagram

30. The ease with which a program can be corrected if an error is encountered, adapted if its environment changes, or enhanced if the customer desires a change in requirements is termed as _____
    a. software quality
    b. usability
    c. correctness
    d. maintainability

31. The quality attributes, design, and implementation constraints, and external interfaces which a software product must have are referred to as _____.
    a. non-functional requirements
    b. business requirements
    c. user requirements
    d. system requirements

32. All of the following are requirement analysis strategies except _____.
    a. Problem analysis
    b. Root cause analysis
    c. Activity elimination
    d. Cost-benefit analysis

33. Which of the following is an element of a data flow diagram (DFD)?
    a. processes
    b. decisions
    c. context diagram
    d. alternatives

34. Verifying the functionality of a module, feature or a complete system without the knowledge of their internal workings is referred to as_____ testing.
    a. regression
    b. white box
    c. black box
    d. integration

35. Proactively planning to avoid risk is termed _____
    a. Risk monitoring
    b. Risk mitigation
    c. Risk management
    d. Contingency planning

36. This testing is used to verify that the system performance is within the defined limits for heavy system loads over long or short periods of time.
    a. Security testing
    b. UAT
    c. Component testing
    d. Stress testing

37. Who proposed the spiral model?
    a. Barry Boehm
    b. Pressman
    c. Royce
    d. IBM

38. Which of the following statements describes work that is not part of the core work of a software engineer?
    a. To understand the problem domain of a software system to-be-developed
    b. To invent a new programming language
    c. To define/evolve the architecture of a software system
    d. To design and develop program code

39. _____ maintenance includes modifications and updates applied to keep the software product up-to date and tuned to the ever-changing world of technology and business environment.
    a. Adoptive
    b. Corrective
    c. Adaptive
    d. Preventive

40. All the following are true about software configuration management except _____.
    a. it ensures that releases are planned and that only authorized changes to the software are made
    b. the integrity of the system is maintained, and the constituents of the software system and their version numbers are known at all times.
    c. it is concerned with the orderly development and evolution of the software.
    d. change requests are scarcely documented and usually not a priority for the change control board

41. Indirect measures of a software product include all of the following expect
    a. maintainability
    b. complexity
    c. efficiency
    d. execution speed

42. _____ provide confidence that a software product is ready for release to potential customers.
    a. Software testing
    b. Software inspection
    c. Configuration auditing
    d. Software walkthroughs

43. In Scrum methodology, who coaches the team, helps the team to understand the Scrum process and ensures that the team performs at the highest level?
    a. The Scribe
    b. The reviewer
    c. The product owner
    d. The scrum master

44. Which of the following document contains the user system requirements?
    a. SRD
    b. DDD
    c. SDD
    d. SRS

45. A _____ architecture separates pieces of the system that need to use a particular function from parts of the system that provide those functions.
    a. component based
    b. client/server
    c. monolithic
    d. service oriented

46. Which of the following UML diagrams is classified under behaviour diagrams?
    a. Class diagram

b. State machine diagram
c. Component diagram
d. Object diagram

47. The class diagram visibility symbol that makes a member visible only to code inside the class and any derived classes is _____.
    a. +
    b. –
    c. #
    d. ~

48. Software maintenance that involves restructuring the code to make it easier to debug and maintain in the future is termed _____.
    a. Perfective maintenance
    b. Adaptive maintenance
    c. Corrective maintenance
    d. Preventive maintenance

49. Which of the following is not a project factor that should be considered when planning the structure of software developing teams?
    a. The rigidity of the delivery date
    b. The degree of sociability required for the project
    c. High frustration caused by personal, business, or technological factors that causes friction among team members
    d. The difficulty of the problem to be solved

50. Software Debugging is known as _____
    a. identifying the task to be computerized
    b. creating program code
    c. creating the algorithm
    d. finding and correcting errors in the program code

1 requirement gathering
2 System design
3 System verification
4. Implementation
Deplo

SECTION B - Answer all questions in this section – (20 marks)

1. Software engineering is a discipline that integrates process, methods, and tools for the development of computer software. A number of different process models for software engineering have been proposed, each exhibiting strengths and weaknesses, but all having a series of generic phases in common. Discuss any one of these process models, with the aid of a diagram. **(10 marks)**
2. Describe the elements of a use case diagram. **(10 marks)**

SECTION C - Answer only one (1) question from this section – (10 marks)

3. Discuss the MOSCOW method for prioritizing requirements. **(10 marks)**
4. FURPS is an acronym for some system's requirement category. Discuss the terms that make up the acronym. **(10 marks)**

SECTION D - Answer only one (1) question from this section – (10 marks)

5. Project management is the process of planning and controlling the development of a system within a specified time frame at a minimum cost with the right functionality. Managing risks is an important project management activity. What steps would you as a project manager take to manage risks in the development of a school management system. **(10 marks)**
6. Discuss any two tools available to you for effective project management. **(10 marks)**
7. What would you do as a project manager to build and maintain a cohesive team? **(10 marks)**

SECTION E - Answer only one (1) question from this section – (10 marks)

A retail business wishes to automate some of its sales procedures. The retailer buys items in bulk from various manufacturers and re-sells them to the public at a profit. Preliminary interviews reveal that there are a number of staff roles in the Sales department. A salesperson can place orders on behalf of customers and check the status of these orders. A technical salesperson has the same duties, but additionally is able to provide customers with detailed technical advice (which we would not expect an ordinary salesperson to be able to do). A sales supervisor is a salesperson, with the additional responsibility of creating new customer accounts and checking their credit-worthiness. A dispatcher is responsible for collecting the goods ordered from the warehouse and packing them for dispatch to the customer. To assist in this operation, the computer system should be able to produce a list of unpacked orders as well as delete orders from the list that the dispatcher has already packed. All staff are able to find general details of the products stocked, including stock levels and locations in the warehouse. A re-ordering clerk is responsible for finding out which products are out of stock in the warehouse, and placing orders for these products from the manufacturers. If these products are required to satisfy an outstanding order, they are considered to be "priority" products, and are ordered first. The system should be able to advise the re-order clerk of which products are "priority" products. A stock clerk is responsible for placing items that arrive from manufacturers in their correct places in the warehouse. To do this the clerk needs to be able to find the correct warehouse location for each product from the computer system. Currently, the same person in the business plays the roles of stock clerk and re-order clerk.

8. For the mini case above, identify one class and represent it on a UML class diagram.
(10 Marks)
9. Create a use case for the system described in the mini-case and represent it in a diagram.
(10 marks)

EXAMINER: BIBI DZIFA TOMIWA