

ICT2622

May/June 2015

OBJECT-ORIENTED ANALYSIS

Duration 2 Hours

100 Marks

EXAMINERS ·

FIRST

SECOND

PROF PL MKHIZE

MR S SINGH

Closed book examination

This examination question paper remains the property of the University of South Africa and may not be removed from the examination venue

This paper consists of 6 pages.

Instructions:

- 1 Answer all the questions
- 2 The mark for each question is given in brackets next to the question.
- 3 All the answers and all the rough work must be done in your answer book
- 4 Number your answers and label your rough work clearly.
- 5 Note that the MCQs in question 1 must be answered in the answer book.

GOOD LUCK!

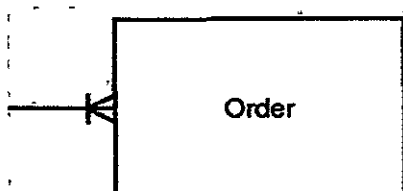
[TURN OVER]

Question 1

[30]

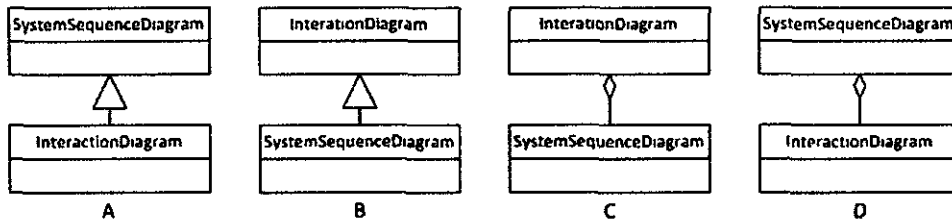
NB: This question must be answered in the answer book with the rest of the exam questions. Write the question number and number corresponding to the correct answer
For example: 33 – B

- 1 Application architecture is used to refer to
 - a. the organization and configuration of all software solutions into information systems
 - b. the application of the information system to solve business problems
 - c. the architectural structure of the subsystems within a software application
 - d. the relationship between software applications and the areas of the organization that they support
- 2 The term _____ refers to all the people who have an interest in the successful implementation of the system
 - a. users
 - b. clients
 - c. managers
 - d. stakeholders
3. Questionnaires can be useful in information gathering when users _____
 - a. are widely distributed geographically
 - b. need prompting to respond to questions
 - c. are not well-informed
 - d. do not have time for interviews
4. The user goal technique normally begins by identifying, listing, and classifying _____
 - a. the system users
 - b. the business events
 - c. the business processes
 - d. the system stakeholders
5. Which of the following is an example of a state event?
 - a. A customer places an order
 - b. It is time to send a late notice
 - c. Management checks order status
 - d. Inventory reorder point is reached
- 6 The _____ indicates that events should be included during analysis only if the system would be required to respond under ideal conditions.
 - a. perfect technology assumption
 - b. ideal technology assumptions
 - c. perfect processing control
 - d. ideal processing control
- 7 An example of an attribute of an object might be _____
 - a. an inventory item
 - b. items on a purchase order
 - c. a social security number
 - d. a calendar
- 8 A relationship that has a cardinality constraint of one or more is a(n) _____ relationship.
 - a. mandatory
 - b. optional
 - c. unary
 - d. binary



- 9 The above cardinality constraint on the Order data entity indicates that there can be _____
- a. zero or many orders
 - b. one or many orders
 - c. many orders
 - d. cannot be determined without the other side of the relationship

- 10 In a fully developed use case description the exception conditions represent what?
- What conditions might cause the system to crash
 - What conditions prevent the system from successfully completing the use case
 - What conditions will confuse the actor
 - Where the system might have “bugs” and produce erroneous results



- 11 Which is correct?
- A
 - B
 - C
 - D
- 12 An action-expression occurs when?
- Before the object leaves the origin state
 - After the object enters the destination state
 - Before the object enters the destination state.
 - Before the transition fires
- 13 Which one of the six core process can be considered as a “bridge” process.
- Identify the problem and obtain approval.
 - Discover and understand the details
 - Design system components.
 - Build, test and integrate system components.
- 14 Which is a characteristic of a peer-to-peer connection
- Connected computers must have the same operating system
 - Connected computers do not use a server
 - Connected computers require special software
 - Connected computers must have over 99% availability
- 15 Operating systems deliberately include an electronic “click” sound for keyboard and mouse activities. This describes which of the eight golden rules for designing interactive interfaces?
- Offer informative feedback
 - Offer simple error handling
 - Support internal locus of control
 - Strive for consistency
- 16 _____ consists of writing statements in a programming language to define what each type of object does
- OOP
 - OOA
 - OOD
 - OOS
17. Which of the following is a basic value of agile software development?
- Following a plan over responding to change
 - Working software over comprehensive documentation
 - Processes and tools over individuals and interactions
 - Contract negotiation over customer collaboration

18. The original method used to process input data in a Web based system was by using computer programs in _____.
a. the Java programming language
b. the .NET programming suite
c. the C++ language for the CGI
d. the Javascript programming language
19. Which two models are the primary models in object-oriented detailed design?
a. Design class diagram and component diagram
b. Package diagram and CRC cards
c. Sequence diagram and state machine diagram
d. Sequence diagram and design class diagram
20. Which of the following is correct UML notation for an attribute in a design class?
a. visibility name.type-expression = initial-value{property}
b. visibility class-name.type-expression {property}
c. visibility name initial-value(property)
d. visibility name:type-expression initial-value (property)
21. Which is the correct notation for a message label on a sequence diagram?
a. * [true/false]RetVal . = name (param)
b. [true/false]RetVal == name (param)
c. [true/false]seq# RetVal ' = name (param)
d. * [true/false] seq# Retval := name (param)
22. When a message is sent from an originating object to a destination object it means that _____
a. data is being passed from the origin object to the destination object
b. a transition is occurring between the objects
c. a method is being invoked on the originating object
d. a method is being invoked on the destination object
23. The final step in the object-oriented design (OOD) process consists of developing the _____.
a. attributes of the design classes
b. method names of the design classes
c. interaction diagrams
d. package diagrams
24. A different implementation of a function is required in an existing system. The best way to integrate this function into the system is _____.
a. to write the code in a new class
b. to write the code in an existing class
c. with the factory pattern
d. with the adapter pattern
25. Given the following code, identify the pattern
Class MyBuilder
{ static MyBuilder builder = null;
 { if builder == null {builder = new MyBuilder(),
 return builder,
 }
}
- a. Factory Pattern
b. Singleton Pattern
c. Factory Method Pattern
d. Adapter Pattern
26. Which of the following is normally the most time-consuming and resource-expensive operation?
a. Building prototypes
b. Observing business processes
c. Researching vendor solutions
d. Interview stakeholders

27. One technique for finding “things” that need to be in the new system is done by the analyst starts making lists of “things.” He may do this from information and even without talking to the users extensively. This technique is called the _____.
a. domain analysis technique c. brainstorming technique
b. check list technique d. noun technique
28. The first step in doing software application design is to _____.
a. define the operating environment.
b. identify the approach -- structured or object-oriented
c. define the programming language to be used.
d. identify the various subsystems and their relationship to each other.
29. A key principle of human-computer interaction (HCI), that states that the appearance of any control should suggest its functionality, is called _____.
a. informative feedback c. consistency
b. affordance d. visibility
30. Each dialog within the system should be organized with a clear sequence—a beginning, middle, and end. This describes which of the eight golden rules for designing interactive interfaces?
a. Offer informative feedback
b. Permit easy reversal of actions
c. Support internal locus of control
d. Design dialogs to yield closure.

Question 2 [5]
Provide a description of the open-items list and then explain why it is important

Question 3 [15]
Develop an activity diagram based on the following narrative. Note any ambiguities or questions that you have as you develop the model. If you need to make assumptions, also note them.

The shipping department receives all shipments on outstanding purchase orders. When the clerk in the shipping department receives a shipment, he or she finds the outstanding purchase order for those items. The clerk then sends multiple copies of the shipment packing slip. One copy goes to Purchasing, and the department updates its records to indicate that the purchase order has been fulfilled. Another copy goes to Accounting department so a payment can be made. A third copy goes to the requesting In-house customer so he or she can receive the shipment. After payment is made, the Accounting department sends a notification to Purchasing. After the customer receives and accepts the goods, he or she sends notification to Purchasing. When Purchasing receives these other verifications, it closes the purchase order as fulfilled and paid.

Question 4 [15]
Create a table showing systems down the rows and the four types of data (domain classes) across the columns. Indicate C, R, U, or D for each domain class and each system. Use the narrative below:

The portion of the database used with the ticket-processing system involves driver data, ticket data, officer data, and court data. Driver data, officer data, and court data are read by the system, and the ticket-processing system creates and updates ticket data. In an integrated system like the ticket-processing system, some domain classes are created by and updated by other systems, as described in this case.

Question 4 [10]
Provide a list of the 10 Agile modelling principles

Question 5 [10]
Discuss the purpose of an SSD, and explain symbols that are used in an SSD

Question 6 [15]
There are at least two approaches to the SDLC, two approaches to software construction and modelling, and a long list of techniques and models

Explain the reasons for diversity in the following approaches

- (1) The field is young,
- (2) the technology changes quickly,
- (3) different organizations have different needs;
- (4) there are many types of systems,
- (5) developers have widely different backgrounds