MISAC 4: In-semester examination 2 evaluation scheme
Software Engineering (CSE 3154), 22.10.2022

MCQ

		Marks	CO	BL
01.	**Which of the following are the outcome of the software design process** 1. Data structures of the individual modules 2. Interfaces among different modules **3. Both 1 and 2** 4. None of the above	**0.5**	**3**	**1**
02.	**Chose the right answer related to software design** 1. Preliminary design is module design at the software level 2. Detailed design is at the software level 3. Preliminary design and detailed design are at the software level **4. Preliminary design is high-level design at the software level**	**0.5**	**3**	**1**
03.	**Which of the following characteristics of a good design address the cost optimization issues in a software project?** **1. Efficiency** 2. Maintainability 3. Understandability 4. Correctness	**0.5**	**3**	**1**
04.	**What is desirous in a good software project?** 1. High coupling and high cohesion 2. Low coupling and low cohesion 3. High coupling and low cohesion **4. Low coupling and high cohesion**	**0.5**	**3**	**1**
05.	**Which of the following is not an advantage of a good design?** **1. Error isolation** 2. Error propagation 3. Scope of reuse 4. Understandability	**0.5**	**3**	**1**
06.	**Identify the cohesion occurrence when a set of functions of the module are executed one after the other** 1. Communicational cohesion 2. Temporal cohesion 3. Logical cohesion 4. **Procedural cohesion**	**0.5**	**3**	**3**
07.	**In a layered design, if a module M2 is controlled by a module M1, then**	**0.5**	**3**	**4**

1. **M2 is in the subordinate layer and M1 is in the superordinate layer**
2. M2 is in the superordinate layer and M1 is in the subordinate layer
3. **M1 is in the superordinate layer and M2 is in the subordinate layer**
4. M1 is in the superordinate layer and M2 is in the superordinate layer

08. If the modules M2, M3 and M4 are controlled by M1 in a layered design, then what is the fan-out and fan-in value of M1? **0.5** **3** **1**

1. **3 and 0 respectively**
2. 0 and 3 respectively
3. 3 and 3 respectively
4. 0 and 0 respectively

09. The extent of data interchange between two modules is called **0.5** **3** **1**

1. Union
2. Cohesion
3. **Coupling**
4. None of the above

10. When we represent the DFD bubbles using 0.1, 0.1.1 and 0.1.1.1, in which level these numbers are represented **0.5** **3** **1**

1. Level 0, Level 1 and Level 2 respectively
2. **Level 1, Level 2 and Level 3 respectively**
3. Level 3, Level 2 and Level 1 respectively
4. Level 2, Level 1 and Level 0 respectively

Descriptive

11. Explain the terms depth, width, fanout and fan-in in a layered software design **2** **3** **2**

Depth represents the number of layers in a layered design. Width refers to the span of control. Fan-out is a measure of the number of modules that are directly controlled by a given module. Fan-in indicates the number of modules that directly invoke a given module

12. Write the context diagram and level 1 DFD for a supermarket software solution **2** **3** **2**

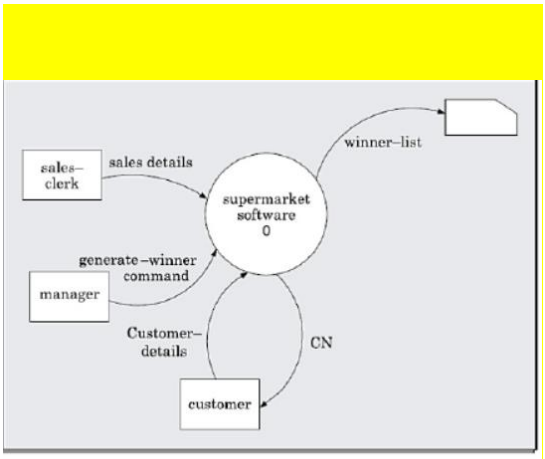

Figure 6.10: Context diagram for Example 6.3.

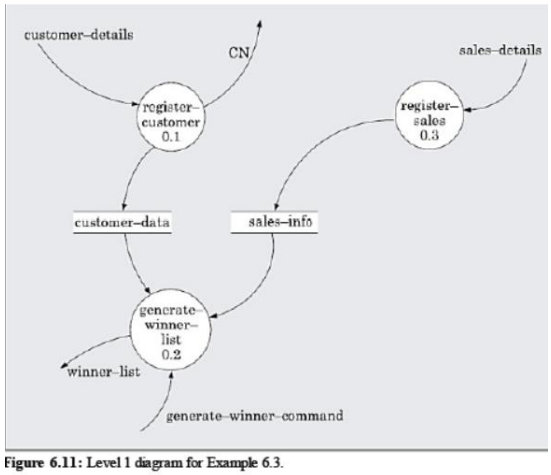

Figure 6.11: Level 1 diagram for Example 6.3.

13. What steps are followed to develop the DFD model of a system more systematically? **3** **3** **1**

Construction of context diagram: Examine the SRS document to determine:
- Different high-level functions that the system needs to perform.
- Data input to every high-level function.
- Data output from every high-level function.
- Interactions (data flow) among the identified high-level functions

Represent these aspects of the high-level functions in a diagrammatic form. This would form the top-level data flow diagram (DFD), usually called the DFD 0.

Construction of level 1 diagram: Examine the high-level functions described in the SRS document. Split if number of bubbles are more than 7 and merge if it is less than 3 (this is the ideal value noticed from the heuristic approach of SD irrespective of the scope and complexity of the project)

Construction of lower-level diagrams: Decompose each high-level function into its constituent sub functions through the set of activities mentioned in point 1: Stop decomposition when further split is not possible.

Carefully number the bubbles as Level 0 – 0, Level 1 – 0.1, Level 2 – 0.1.1, level 4 – 0.1.1.1.

14. List and discuss the commonly made errors while constructing a DFD model **3** **3** **1**

It is useful to understand the different types of mistakes that beginners usually make while constructing the DFD model of systems, so that you can consciously try to avoid them (It is important to realise that a DFD represents only data flow, and it does not represent any control information.)

- Many beginners commit the mistake of drawing more than one bubble in the context diagram. Context diagram should depict the system as a single bubble. A system is always represented with one bubble with input and output.
- Many beginners create DFD models in which external entities appearing at all levels of DFDs. All external entities interacting with the system should be represented only in the context diagram. The external entities should not appear in the DFDs at any other level (E.g.: Director of MIT is the main contact person for other institute heads)
- It is a common oversight to have either too few or too many bubbles in a DFD. Only three to seven bubbles per diagram should be allowed. This also means that each bubble in a DFD should be decomposed three to seven bubbles in the next level.
- Many beginners leave the DFDs at the different levels of a DFD model unbalanced which creates burden to one module where they have to work more on requirements and also this leads to increased number of classes on one module.