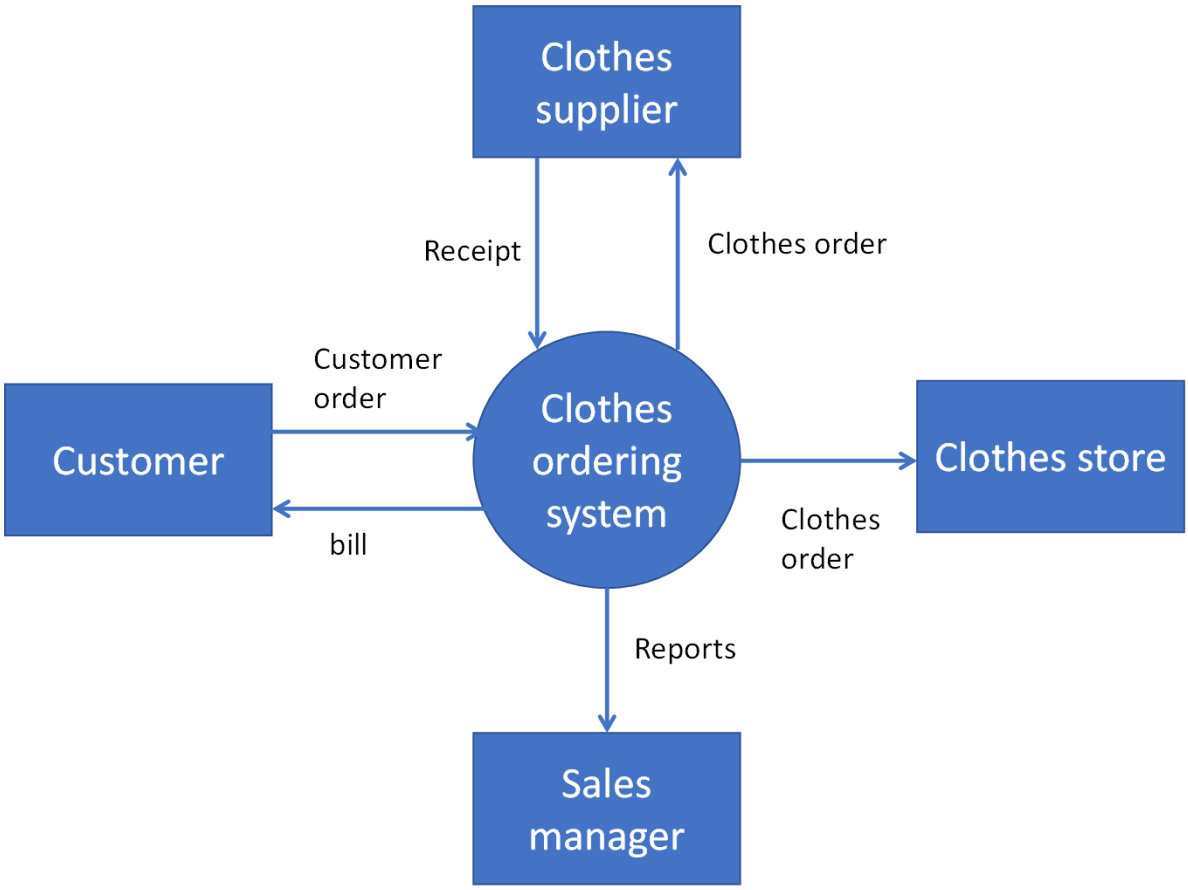
Department of Computer Science and Engineering
Quiz 3 (Set 1), Summer 2023
CSE471: System Analysis and Design

Total Marks: 10 **Time Allowed: 30 minutes**

Name:	**ID:**



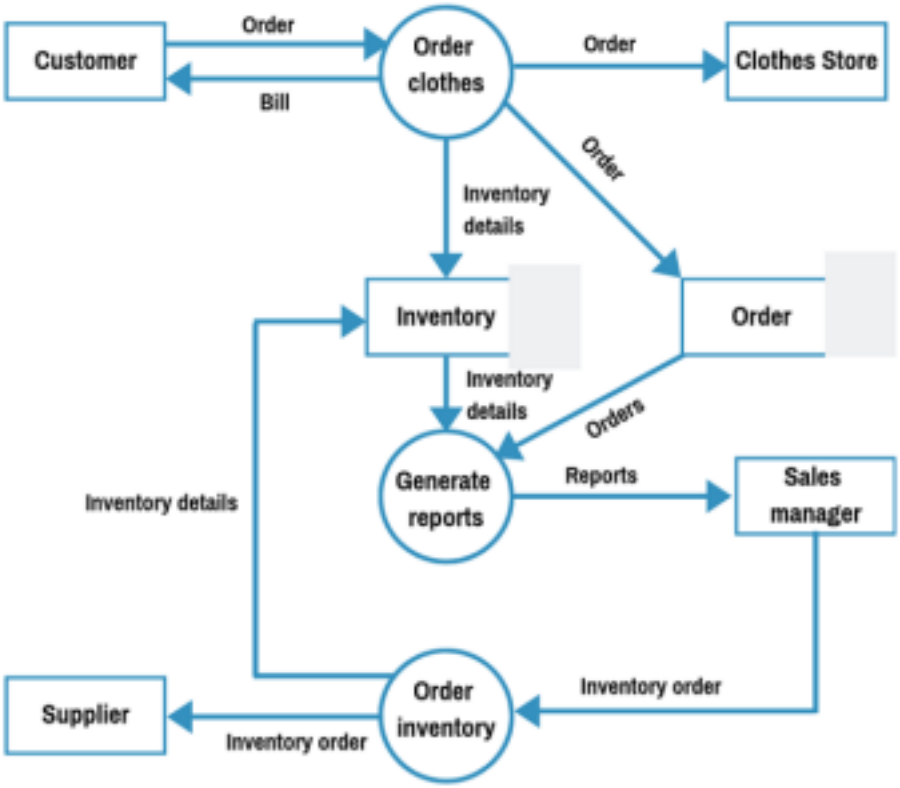
1. The above diagram in the context diagram of a cloth ordering system. Read the following scenario carefully.

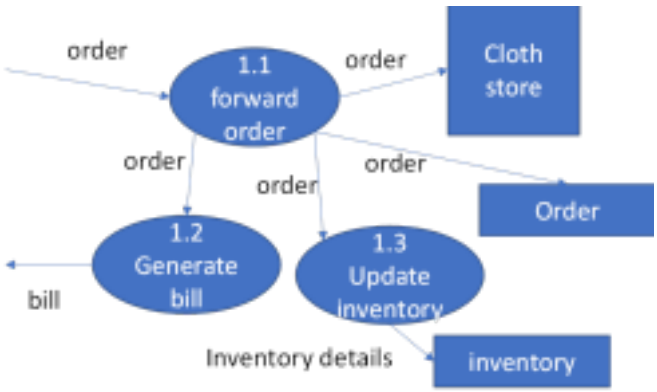
a. Clothes ordering system is decomposed into order cloths, generate reports and order inventory processes. Order clothes process, take customer order and send it to clothes store and order datastore. This process also sends a bill to the customer and updates the inventory datastore. Generate reports receive orders and inventory details and send the report to the sales manager. Sales managers place inventory orders into the inventory process and forward the inventory order to the supplier and update the inventory. **Design level-1 DFD based on above scenario.**

b. Now you need to decompose the Order clothes process only. Forward order takes orders from the customer and sends that information to generate bills and update inventory process. Generate bill process generates bill based on the order and Inventory is updated by update inventory process. **Design level-2 DFD for order cloth process and**

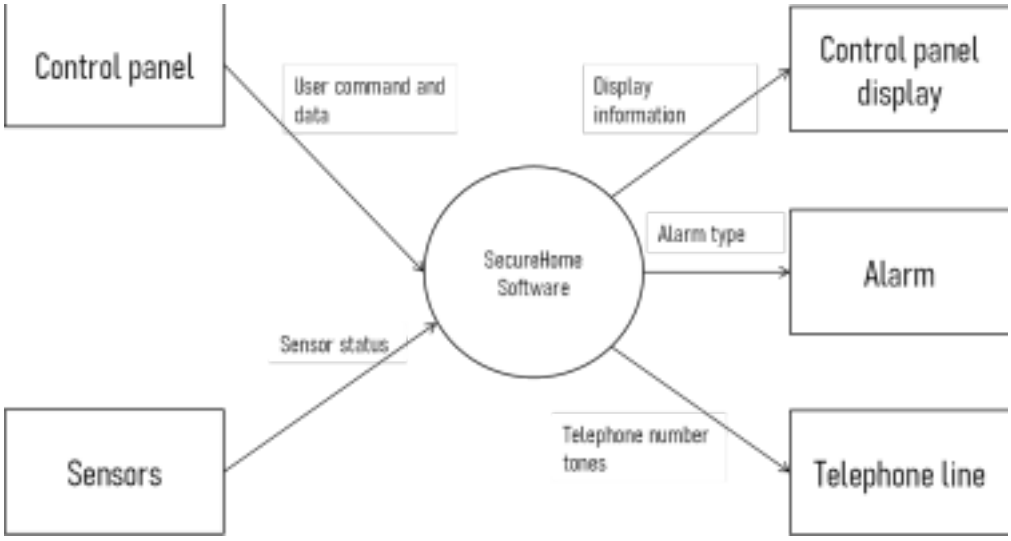
make sure it is Balanced. Also mention if you find any error in the scenario.

SOLUTION





Question 2



2. The SecureHome security framework is illustrative of numerous PC based items and frameworks. The item screens this present reality and responds to changes that it experiences. It additionally connects with a client through a progression of composed sources of info and alphanumeric display.

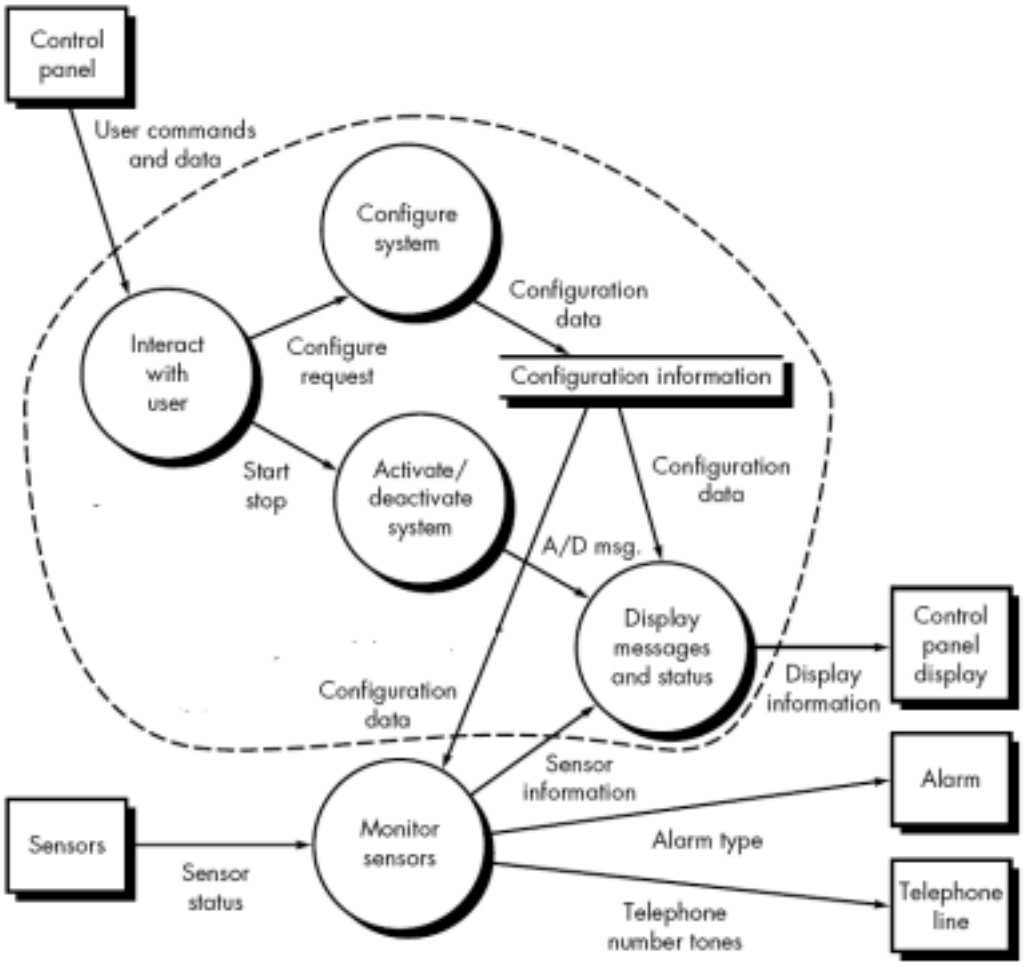
a. Now draw a level 1 diagram using the following scenario.

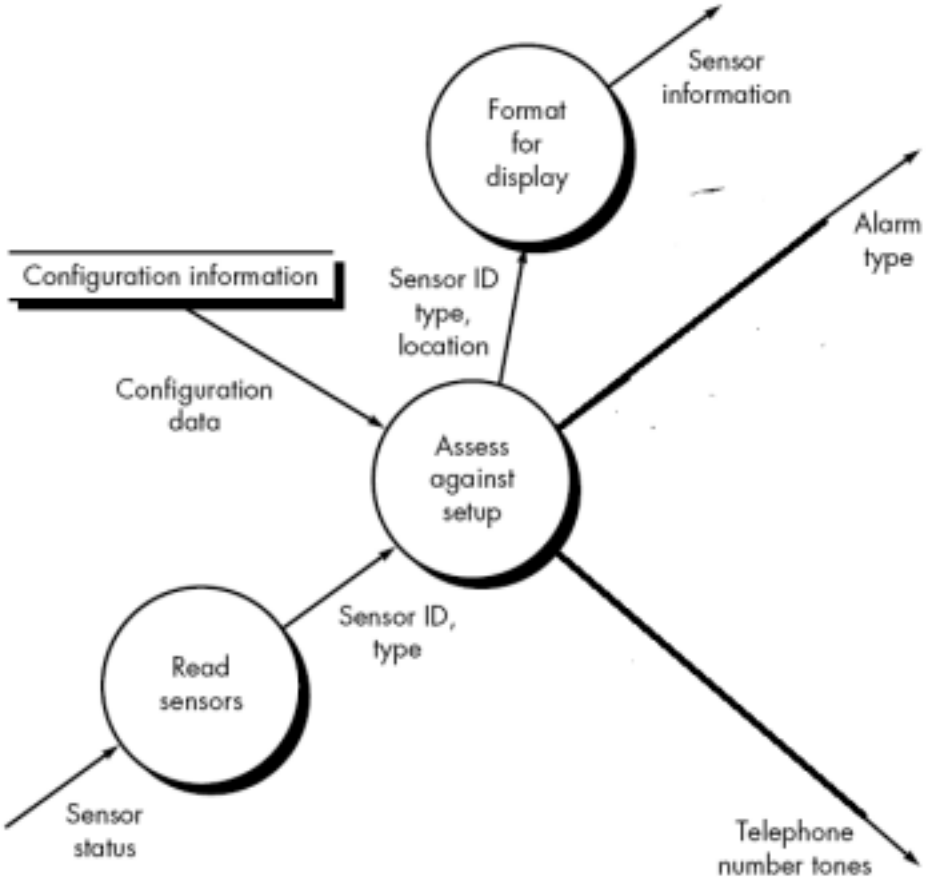
Control panel send user command and data to Interact User process. This process sends a configure request to configure management process and start/stop signal to Activate/Deactivate system process. Configuration information datastore receives configuration data and sends it to the Display messages and status process. Display messages and status process also receive A/D messages and send display information to control panel display. On the other hand Monitor sensor process receives sensor status from sensor and configuration data from Configuration information datastore. It also sends alarm type information to Alarm, sensor information to display messages and status and telephone number tones to telephone lines.

b. Now design a level 2 diagram for the Monitor sensor process based on the following scenario.

Read sensor subprocess receive sensor status and select sensor ID, type to setup assessment process. This process also receives configuration data and generates alarm type and telephone number tones. Finally it sends sensor ID, type, location to Format for display process which ultimately creates sensor information.

Solution:


Control panel
User commands and data
Configure system
Configuration data
Interact with user
Configure request
Configuration information
Start stop
Activate/ deactivate system
Configuration data
A/D msg.
Display messages and status
Control panel display
Display information
Configuration data
Sensor information
Alarm
Sensors
Monitor sensors
Alarm type
Sensor status
Telephone line
Telephone number tones



Question 3

Bracu wants to implement a smart security system for the safety of students and staff in the main entrance of their permanent campus. Xtech, a software development company filed their proposal to the authority as the following:

Every person inputs their unique ID number along with their fingerprint into the system. The unique ID is provided to the verify identity process, which then compares it to data already stored in the student information data store. The fingerprint information from the student information data store is also matched with the new fingerprint that is given by the student. If a staff (i.e. faculty) wants to enter the premises, he or she must provide his PIN number and the system verifies the credentials with the information from the staff information database. The process uses Neural Network technique and sends back the match result. An error message is sent to the student or staff by the verify identity process if the credentials do not match. User feedback is necessary to fulfill the requirements of the students and staff. Therefore, the show rating process collects the list of all the recent reviews posted by previous users from the review data store and displays it to the user along with an input box where the user can also post their review along with a numeric value. The user receives an acknowledgement for successful review and subsequently the show rating process updates the review data store.

An analyst can request for the total rating information to generate reports. It fetches all the rating

information collected from the rating data store, prepares a report and sends it to the analyst. By using natural language processing generate reports also provides the analyst with the most used keywords(i.e. Good, excellent, poor) Lastly, the analyst shares the insights with the project owners. There may be some peak hours when the review process may create long queues and thus hamper the university education process. Therefore, at peak hours a security office can pause the rating process and only verify the credentials. A security office is also responsible for adding new students or staff to the system.
Design a context diagram based on the above scenario. [CO2]
Design a level 1 diagram using the above scenario. Also identify if there is any error in the diagram.

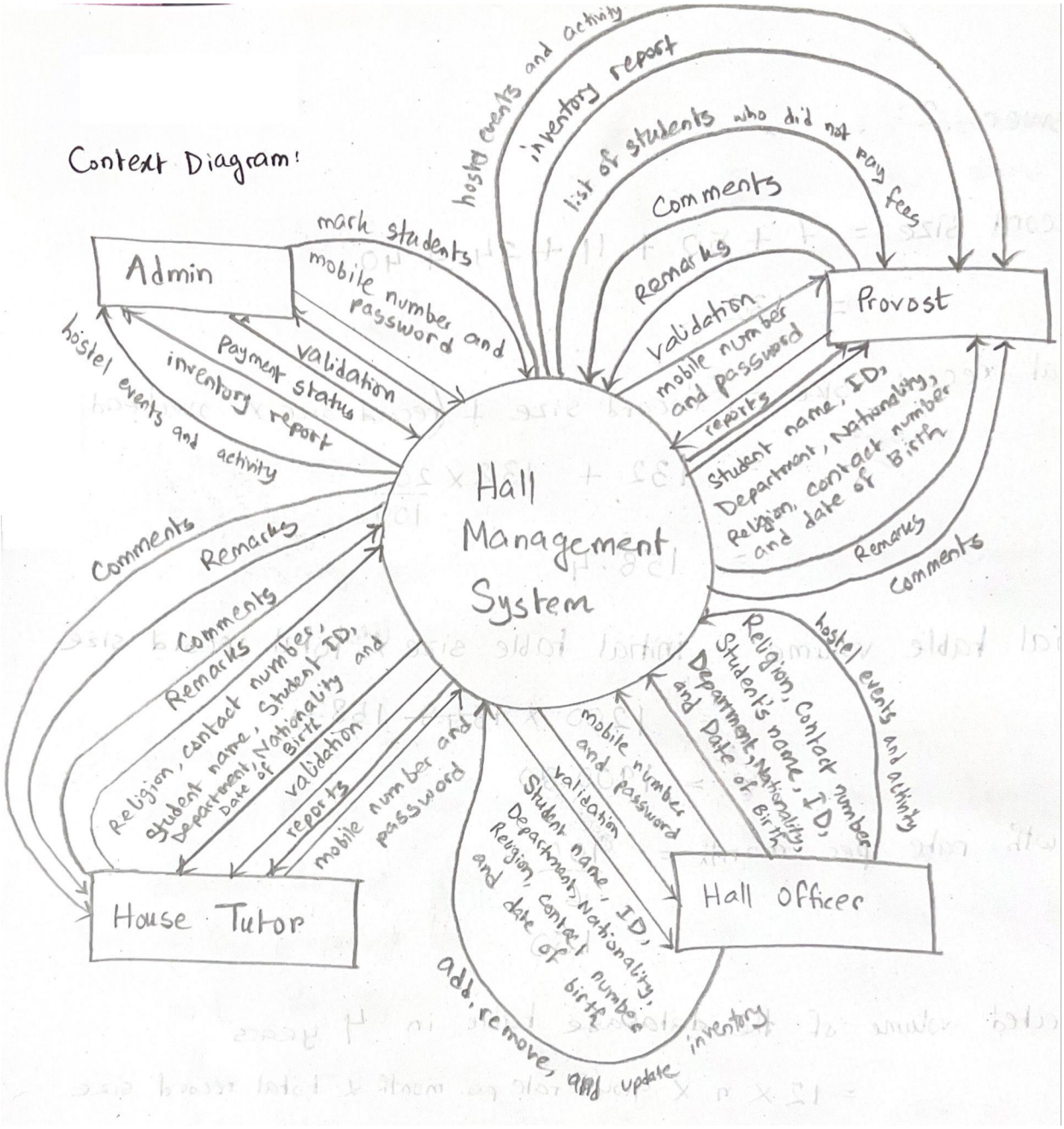
Question 4

BRAC University is planning to develop a 'Hall Management System' for the foreign students. There are four types of users: Admin, Provost, House Tutor and Hall Officer.
Any user needs to login using his mobile number and password. After validation by the system, the user can enter the system according to his/her user role. Hall officers store the following information of each student to the system: Student's name, Student ID, Department, Nationality, Date of Birth, Religion and Contact number. The system displays student information to House Tutors, Provost and Hall Officer. Provost and Hall Officer can sort and search students based on every criterion available. They can generate printable reports about student information generated from search queries. Remarks or comments about students can be stored by house tutors and the provost. Remarks about the student added by House tutor will be visible to House Tutors and Provost only; whereas remarks added by provost will be visible to the provost only. Admin update the payment status of a student after receiving the pay slip to payment datastore and mark the students who have paid their hall admission fees. Provost will be able to see a list of students who have not yet cleared their hall admission and residence fees.
Hall officers can maintain an inventory for maintenance of equipment and supplies. He can add, remove or update the inventory. Every month a report of inventory status will be generated and shared with the provost. Provost can check and forward it to the Admin. Hall officer can add hostel events and activities data, such as orientation programs, social events, and community service projects which will be notified to the Provost and Admin.

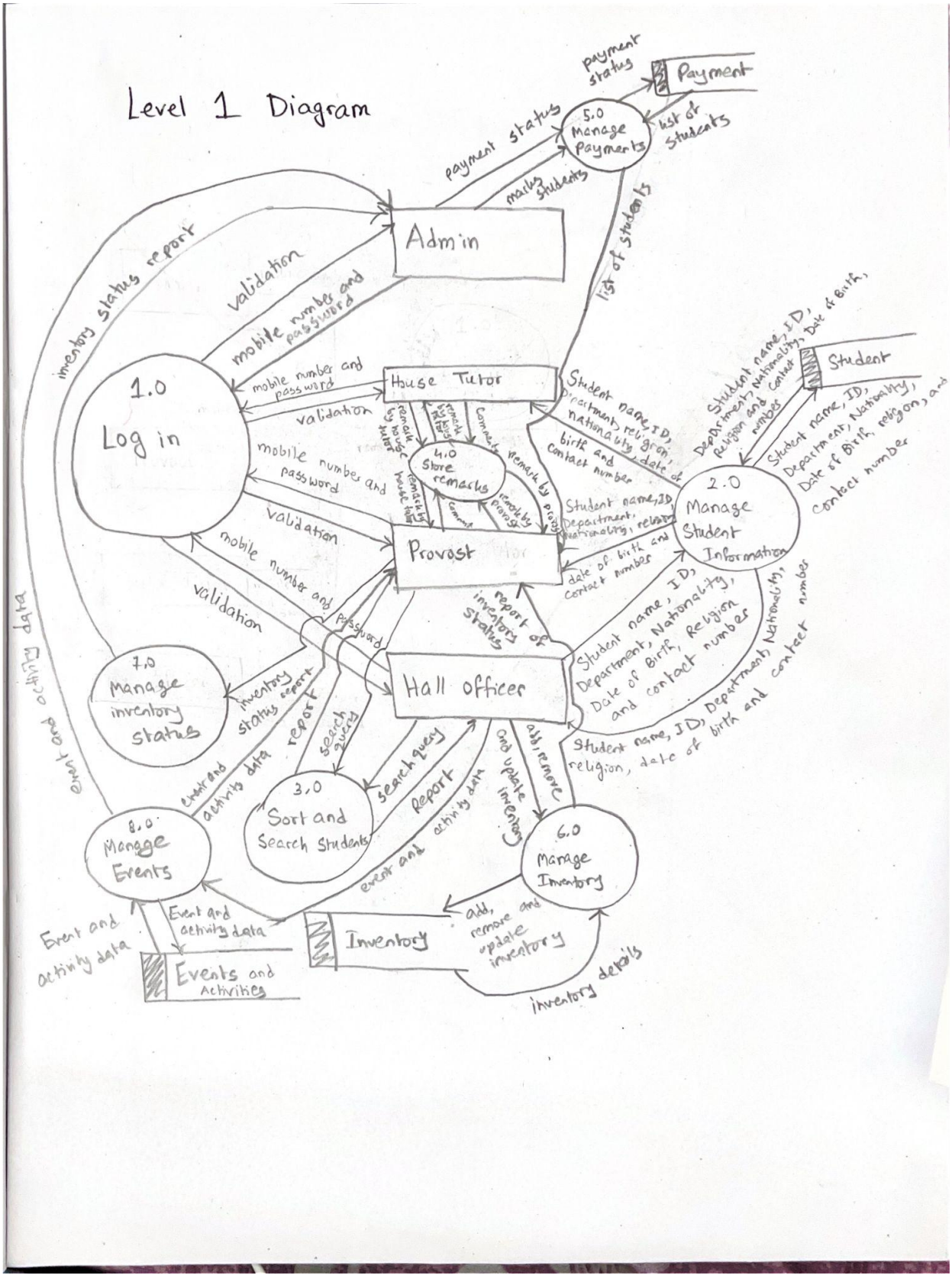
[3 marks] **Design** a context diagram based on the above scenario.
[7 marks] **Design** a level 1 diagram using the above scenario.

SOLUTION

Context Diagram:



Level 1 Diagram

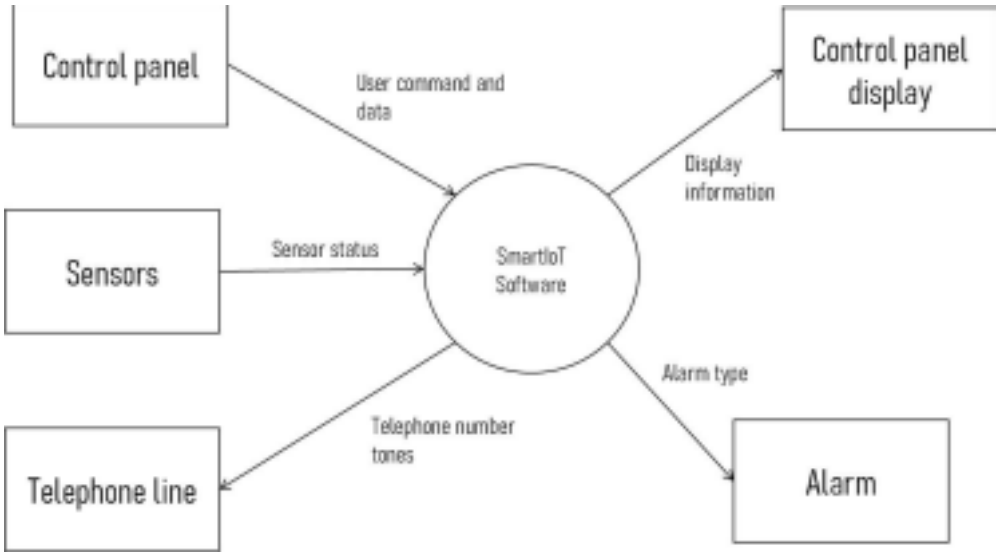


Question 5

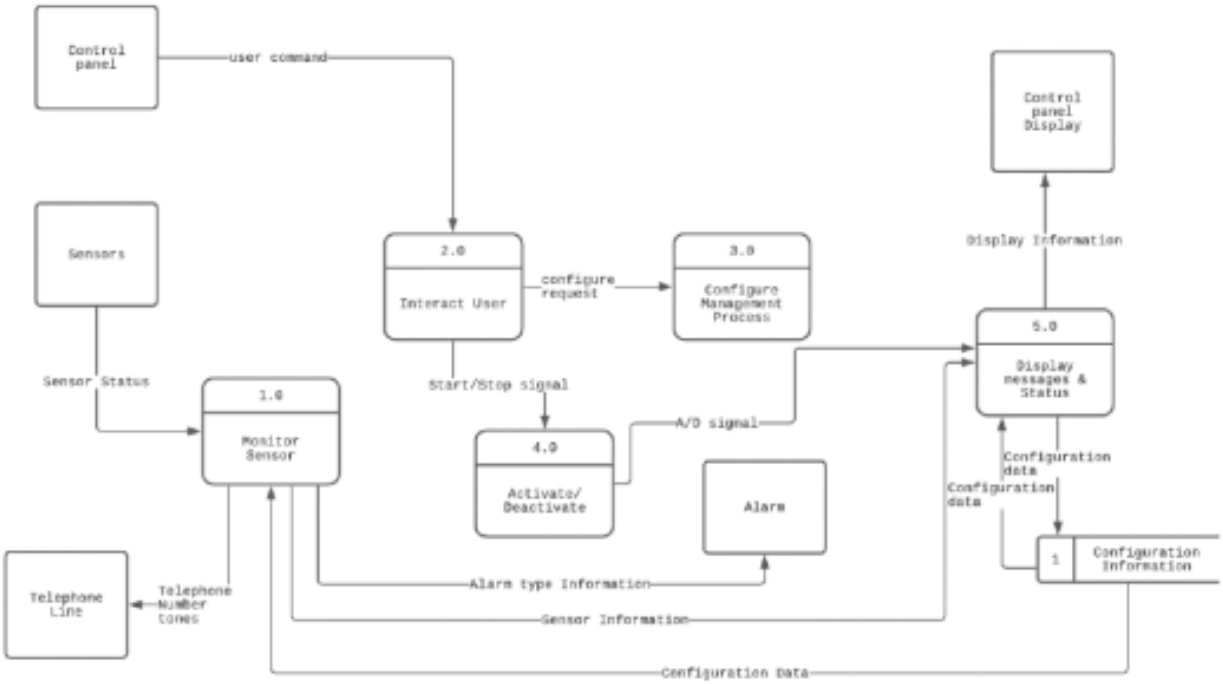
The SmartIoT software is illustrative of numerous PC based items and frameworks. The item screens this present reality and responds to changes that it experiences. It additionally connects with a client through a progression of composed sources of info and alphanumeric display.

Control panel send user command and data to Interact User process. This process sends a configure request to configure management process and start/stop signal to Activate/Deactivate system process. Configuration information datastore receives configuration data and sends it to the Display messages and status process. Display messages and status process also receive A/D messages and send display information to control panel display. On the other hand Monitor sensor process receives sensor status from sensor and configuration data from Configuration information datastore. It also sends alarm type information to Alarm, sensor information to display messages and status and telephone number tones to telephone lines.

1. Draw a context diagram based of the above scenario. (4 marks)



2. Design a level 1 diagram using the above scenario. (6 marks)


Control panel
user command
Control panel Display
Sensors
2.0
Interact User
configure request
3.0
Configure Management Process
Display Information
5.0
Display messages & Status
Sensor Status
1.0
Monitor Sensor
Start/Stop signal
A/D signal
4.0
Activate/ Deactivate
Alarm
Configuration data
Configuration data
1
Configuration Information
Telephone Line
Telephone Number tones
Alarm type Information
Sensor Information
Configuration Data