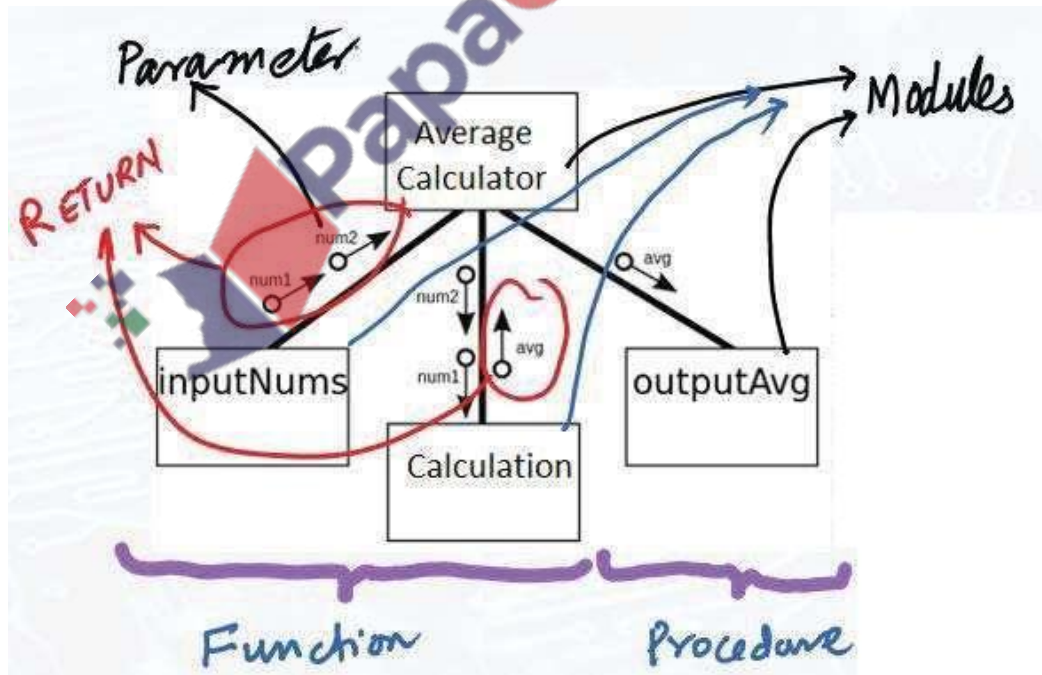


## Structure Chart

A Structure Chart is a chart which shows the breakdown of a system to its lowest manageable parts. They are used in structured programming to arrange program modules into a tree. Each module is represented by a box, which contains the module's name. The tree structure visualizes the relationships between modules, showing data transfer between modules using arrows. Structured Charts are an example of a **top-down** design where a problem (the program) is broken into its components. The tree shows the relationship between modules, showing data transfer between the models.

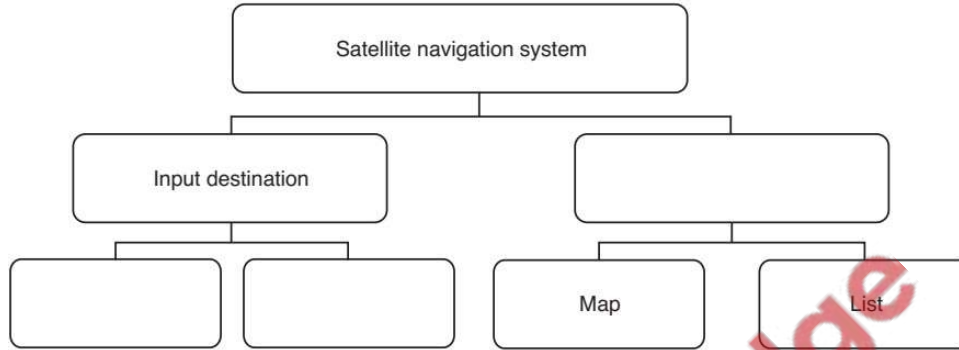
Symbol	Name	Meaning
Module Name	Process	Each Box represents a programming module, this might be something that calculates the average of some figures, or prints out some pay slips
○ →	Data Couple	Data being passed from module to module that needs to be processed.
● →	Flag	Check data sent to process to stop or start processes. For example when the End of a File that is being read is reached, or a flag to say whether data sent was in the correct format

These individual problems can then be solved and combined according to the links that have been used. If the links between the different blocks are used correctly, the result is a solution to the original problem.



**10.1** A satellite navigation system works using destination details entered by the user, either a new destination or chosen from previously saved destinations. The satellite navigation system will then output directions to the destination in the form of either a visual map or a list of directions. A satellite navigation system is an example of a computer system that is made up of sub-systems. This structure diagram shows some of its sub-systems.

Complete the diagram by filling in the empty boxes. [2]



**Q 10.2** A modular program design consists of four modules:

**Module1** has three sub-tasks. Each sub-task is implemented by a single sub-routine (a function or a procedure).

The subroutine headings are defined as follows:

FUNCTION **Module2** (Weight : REAL) RETURNS BOOLEAN

PROCEDURE **Module3** (Weight : REAL, Customer : STRING, Purchased : DATE)

FUNCTION **Module4** (Purchased : DATE, Account : INTEGER) RETURNS INTEGER

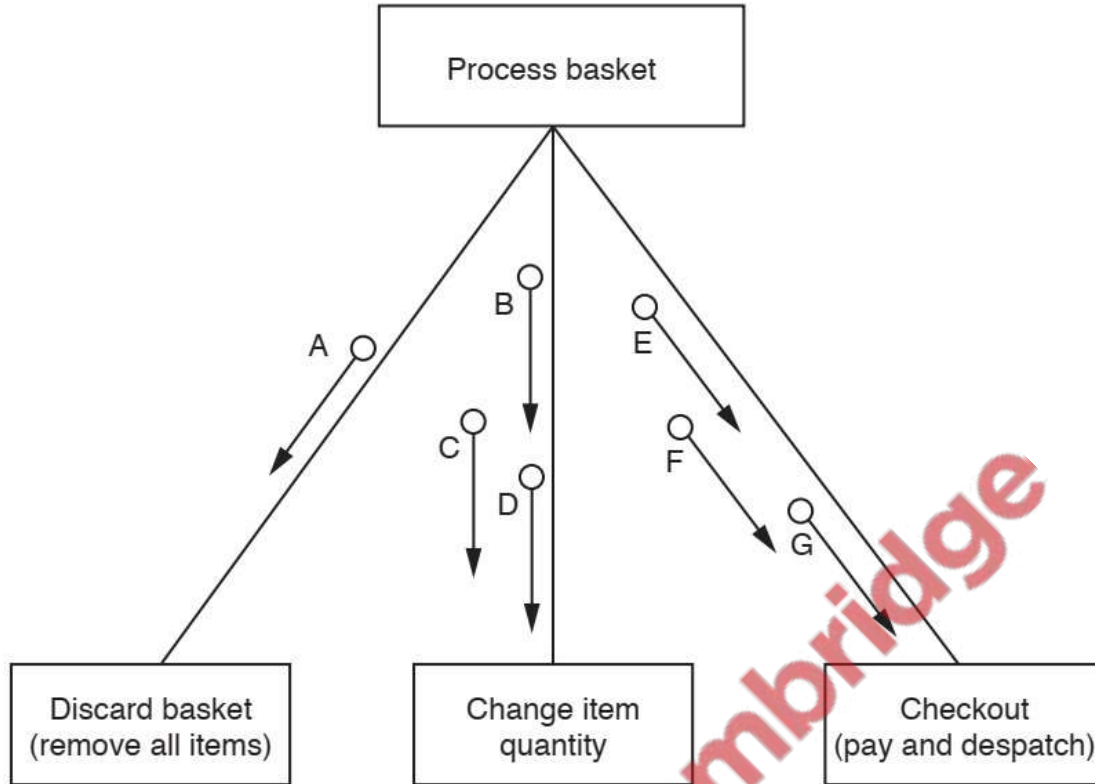
(a) State the term given to values passed between modules.

.....[1]

(b) Draw a structure chart to represent the program design.

Use the letters in the table to label the values passed between modules.

Value	Label
Boolean return value	A
Integer return value	B
Account	C
Customer	D
Purchased	E
Weight	F



(a) (i) Draw on the chart to show the following facts.

- Each of the modules at the lower level returns a Boolean parameter, X. [2]

(ii) The parameters A to G shown on the chart will be used to pass the following information.

*PaymentDetails*

*Quantity*

*BasketID*

*DeliveryAddress*

*ItemID*

Complete the following table to show the parameter and the information it represents. [3]

Parameter	Information
A	
B	
C	
D	
E	
F	
G	