CHAPTER

1

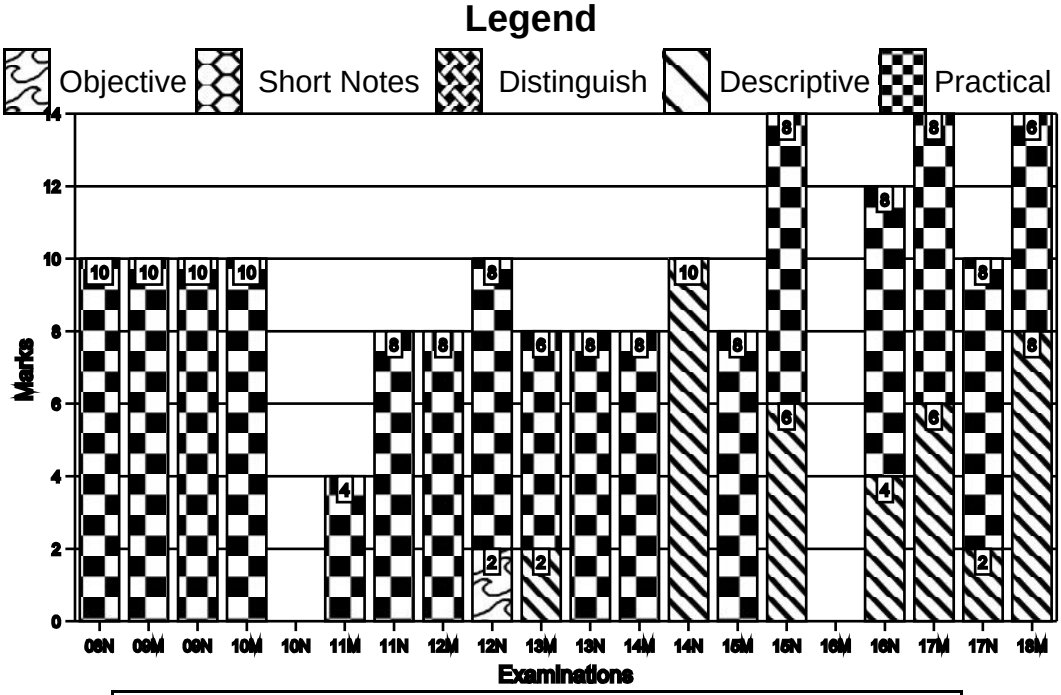
Automated Business Processes

This Chapter Covers: Study's Chapter: 1

Chapter Comprises: *Enterprise Business Processes ☞ Automated Business Processes ☞ Enterprise Risk Management ☞ Risks ☞ Controls ☞ Risks and Controls for specific Business Processes ☞ Regulatory and Compliance Requirements.*

THE GRAPH . . . . . ***Trend Analysis***

Marks of Objective, Short Notes, Distinguish Between, Descriptive & Practical Questions



For detailed analysis Login at *www.scannerclasses.com*
for registration and password see first page of this book.

TIME MANAGER				..... *Plan and Manage your Time*				
Time	***First In-depth learning***	***Instant Revision (in hours)***		***Periodic Revision (in hours)***				
	i.e..... ..... Day 1	Next day i.e.... ..... Day 2	After 7 days i.e. on ..... Day 8	After 30 days i.e. on ..... Day 30	After 60 days i.e. on ..... Day 60	After 90 days i.e. on ..... Day 90	Fix as per your need.	
1. Budgeted	16	4.00	3.12	2.20	1.35	1.35		
2. Actual								
3. Variance (1-2)								

QUICK LOOK	..... *Weightage Analysis*	
Repeatedly Asked Questions	**Common Answered Questions**	**Must Try Question**
	6.1	1.2, 3.6, 6.5

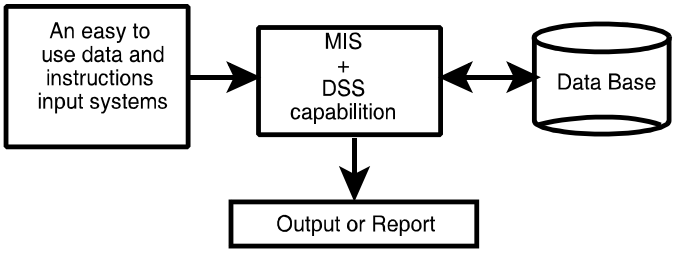
1 *Introduction*

Q.1.1	2007 - Nov [6] (c)	Descriptive

Briefly explain the principles to guide the design of measures and indicators to be included in EIS. (5 marks) *[C.A. Final - I]*

Answer:

Meaning of EIS	• EIS is a tool that is designed to meet the special needs of top-level managers. • EIS provides direct on-line access to relevant information in a useful and navigable format. Relevant information is timely, accurate, and

	actionable about aspects of a business that are of particular interest to the senior manager. • The useful and navigable format of the system means that it is specifically designed to be used by individuals with limited time, limited keyboarding skills, and little direct experience with computers. • An EIS is easy to navigate so that managers can identify broad strategic issues, and then explore the information to find the root causes of those issues. • EIS is mainly an advancement of MIS but it can include the Decision Support System (DSS). 
Principles that guide design of measures	1. An Executive Information System (EIS) is a tool that provides direct on-line access to relevant information in a useful and navigable format. 2. EIS is a computer based information system that serves the information need of top executives. 3. EIS enables users to extract summary data and model complex problems without the need to learn query languages, statistical formulas or high computing skills. 4. EIS is very user friendly, supported by graphics and exception reporting and drill down capabilities. 5. EIS provides rapid access to timely information and direct access to management reports. 6. EIS is capable of accessing both internal data

	and external data. 7. EIS is easily connected to Internet (with online information services and e-mail) 8. EIS provides extensive online analysis tool like trend analysis, market conditions etc. 9. EIS can easily be given a DSS support for decision making. 10. EIS is easy to navigate so that managers can identify broad strategic issues, and then explore the information to find the root causes of those issues.

Q.1.2	RTP	Descriptive
Discuss Executive information systems (EIS) and its components.		

Answer:

Executive Information Systems (EIS):

An Executive Information System (EIS) is the nature of Information System used by executives to access and administer the data they entail to make informed business decisions. In the hierarchical structure of information systems, the EIS is at the pinnacle and is designed to renovate all significant data (from project to process to budget) into aggregated information that makes sense and brings value to the by and large business strategy. EIS is able to link data from various sources both internal and external to provide the amount and kind of information executives find useful. These systems are designed for top management; easy to use present information in condensed view; access organisation's databases and data external to the organisation.

Components of an EIS

Components	Description
Hardware	Includes Input data- entry devices, CPU, Data Storage files and Output Devices.
Software	Includes Text base software, Database and Graphic types such as time series charts, scatter diagrams, maps, motion graphics, sequence charts and comparison- oriented graphs (i.e., bar charts) Model base.
User Interface	Includes hardware (physical) and software (logical) components by which people (users) interact with a machine. Several types of interfaces can be available to the EIS structure, such as scheduled reports, questions/answers, menu driven, command language, natural language and input/output.
Tele-communication	Involves transmitting data from one place to another in a reliable networked system.

2 *Enterprise Business Processes*

Q.2.1	2014 - Nov [2] (a)	Descriptive
What are the various key factors to be considered in implementing Business Process Management (BPM) in an enterprise? (4 marks)		

Answer:

Various key factors to be considered in implementing Business Process Management (BPM) in an enterprise are as follows:

Factors	Key Considerations
Scope	A single process, a department, the entire company.

Goals	Process understanding, Process Improvement, Process Automation/ Optimization and Process re-engineering.
Methods to be used	Six Sigma, BPM Life Cycle Method, TQM, Informal methods.
Skills Required	Consultants, Train Employees, Formal Certification, Basic Education, Existing Skill sets.
Tools to be used	White-Boards, Sticky Notes, Software for Mapping, Documenting, Software for Simulation, Comprehensive BPMS.
Investments to Make	Training, Tools, Time.
Sponsorship/Buy-in Needed	Executive Level, Department Level, Process Owner Level, Employee Level.

Q.2.2	**2014 - Nov [2] (b)**	**Descriptive**
What are the major reasons for failure of Business Process Management System (BPMS)? (4 marks)		

Answer:

Reason for Failure of BPMS:

1. The consumer is often confronted with poor customer service due to broken processes, inefficient processes and manual processes- that is the customer is often confronted (challenged) with the silos of the organisation.
2. The same consumer is becoming more and more demanding with respect to delivery time and also demanding higher quality of the products or services.
3. The product or service is becoming more and more personalized supported by increased customer services.

4. Inadequate investment in ongoing training for involved personnel and deficient executive involvement.

5. Breakdown in gap analysis due to deficient project management.
6. Inefficient corporate policy protecting the integrity of data in BPMS.

Q.2.3	2017 - May [1] {C} (a)	Descriptive
Write any two principles of Business Process Management. (2 marks)		

Answer:

Principles of Business Process Management:		
1.	**Principle of Context Awareness**	BPM should fit to the organisational context. It should be tailor made and should not follow cook book approach.
2.	**Principle of Continuity**	BPM should be a continuous and permanent practice. It should not be a one-off project.

Q.2.4	RTP	Descriptive
Define Business Process		

Answer:

Business Process:

A Business Process Consists of a set of activities that are performed in coordination in an organizational and technical environment. These activities jointly realize a business goal. Each business process is enacted by a single organization, but it may interact with business processes performed by other organizations. To manage a process, the first task is to define it that involves defining the steps/ tasks in the process and mapping the tasks to the roles involved in the process. Once the process is mapped and implemented, performance measures are established. The last piece of the process management definition describes the organizational setup that enables the standardization of and adherence to the process throughout the organization.

3 *Automated Business Processes*

Q.3.1	2014 - Nov [1] {C} (e)	Descriptive
What are the objectives of business process automation? (2 marks)		

Answer:

The success of any business process automation shall only be achieved when BPA ensures	
Confidentiality	To ensure that data is only available to persons who have right to see the same;
Integrity	To ensure that only authorized amendments can be made in the data;
Availability	To ensure that data is available when asked for; and
Timelines	To ensure that data is made available at the right time. To ensure that all the above parameters are met, BPA needs to have appropriate internal controls put in place.

Q.3.2	2015 - Nov [1] {C} (a)	Descriptive
Mention the challenges in implementing 'Business Process Automation'. (2 marks)		

Answer:

Challenges in implementing Business Process Automation		
1.	**Planning**	It requires determining the goals, of the information system function and the means of achieving these goals.
2.	**Organizing**	It involves gathering, allocating and coordinating the resources needed to accomplish the goals.

3.	**Leading**	It involves motivating, guiding and communicating with personnel.
4.	**Controlling**	Comparing actual performance with planned performance as a basis for taking any corrective actions that are needed.
5.	**Increase in Number of interface with Customers**	Since the number of interface with customers is growing for e.g. phone, e-mail, SMS, Whatsapp etc. it becomes difficult to handle.
6.	**High Cost**	It plays heavily on the budget of the company.

Q.3.3	**2015 - Nov [6] (b)**	**Descriptive**

What is meant by 'controls' in BPA? What are their major objectives? (4 marks)

Answer:

Business Process Automation Controls	
Meaning of Business Process Automation	• BPA is the basic component of an enterprise-wide automation and management scheme for both business and IT workflow. It refers to removing the human element from existing business processes by automating the repetitive or standardized process components. It ranges from automating a simple data-entry-manipulation task to building complex, automated financial management processes using existing applications.
Meaning of Control	• Control is defined as policies, procedures, practices and organization structure that are designed to provide reasonable assurance that business objectives are achieved and undesired events are prevented or detected are corrected.

Major Objectives of Controls in BPA:		
1.	**Authorization**	It ensures that all transactions are approved by responsible personnel in accordance with their specific or general authority before the transaction is recorded.
2.	**Completeness**	In ensures that no valid transactions have been omitted from the accounting records.
3.	**Validity**	It ensures that all valid transactions fairly represent the economic events that actually occurred, are lawful in nature and have been executed in accordance with management's general authorization.
4.	**Accuracy**	It ensures that all valid transactions are accurate, consistent with the originating transaction data, and information is recorded in a timely manner.
5.	**Physical Safeguards and Security**	Ensures that access to physical assets and information systems are controlled and properly restricted to authorized personnel.
6.	**Error Handling**	It ensures that errors detected at any stage of processing receive prompt corrective action and are reported to the appropriate level of management.
7.	**Segregation of Duties**	It ensures that duties are assigned to individuals in a manner that ensures that no one individual can control both the recording function and procedures relative to processing a transaction.

Q.3.4	**2017 - May [6] (b)**	**Descriptive**
What are the generic reasons for going for Business Process Automation? (4 marks)		

Answer:

Business Process Automation		
Meaning	BPA is the basic component of an enterprise-wide automation and management scheme for both business and IT workflow. It refers to removing the human element from existing business processes by automating the repetitive or standardized process components. It ranges from automating a simple data-entry-manipulation task to building complex, automated financial management processes using existing applications.	
Need of BPA		
1.	**Fast service to customers**	This was not the initial reason for adaption of BPA but gradually business managers realized that automation could help them to serve their customers faster and better.
2.	**To remain competitive and enhancing goodwill**	To provide the level of products and services as offered by competition and thus enhancing goodwill.
3.	**Cost Saving**	Automation leads to saving in time and labour costs.
4.	**Error free**	To provide error free services to the customer.
5.	**Focus on key areas**	Freeing people from routine and volume, and allow management to do what they are best at make decisions, analyze data implications and trends and focus on providing better customer service.

Q.3.5	RTP	Descriptive
Briefly discuss the benefits of Business Process Automation.		

Answer:

Benefits of Business Process Automation (BPA) are:

- **Saving on Costs:** Automation leads to saving in time and labour costs.
- **Staying ahead in Competition:** Today to survive, businesses need to adopt automation.
- **Fast service to Customers:** Nowadays, business managers realize that automation help them to serve their customers faster and better.

Q.3.6	RTP	Descriptive
Discuss the steps in implementing Business Process Automation.		

Answer:

The steps in implementing Business Process Automation are:

(i) Step 1: Define why we plan to implement a BPA?

The primary purpose for which an enterprise implements automation may vary from enterprise to enterprise . A list of generic reasons for going for BPA may include any or combination of the following:

- Errors in manual processes leading to higher costs.
- Payment processes not streamlined, due to duplicate or late payments, missing early pay discounts and losing revenue.
- Paying for goods and services not received.
- Poor debtor management leading to high invoice aging and poor cash flow.
- Not being able to find documents quickly during an audit or lawsuit or not being able to find all documents.
- Lengthy or incomplete new employee or new account on boarding.
- Unable to recruit and train new employees, but where employees are urgently required.
- Lack of management understanding of business processes.
- Poor customer service.

(ii) Step 2: Understand the rules/ regulation under which enterprise needs to comply with?

One of the most important steps in automating any business process is to understand the rules of engagement, which include following the rules, adhering to regulations and following document retention requirements. This governance is established by a combination of internal corporate policies, external industry regulations and local, state and central laws. Regardless of the source, it is important to be aware of their existence and how they affect the documents that drive the processes. It is important to understand that laws may require documents to be retained for specified number of years and in a specified format. Entity needs to ensure that any BPA adheres to the requirements of law.

(iii) Step 3: Document the Process, we wish to automate

At this step, all the documents that are currently being used need to be documented. The following aspects need to be kept in mind while documenting the present process:

- What documents need to be captured?
- Where do they come from?
- What format are they in Paper, Fax, email, PDF etc.?
- Who is involved in processing of the documents?
- What is the impact of regulations on processing of these documents?
- Can there be a better way to do the same job?
- How are exceptions in the process handled?

The benefit of the above process for user and entity being that it provides clarity on the process, helps to determine the sources of inefficiency, bottlenecks and problems and allows tore- design the process to focus on the desired result with workflow automation.

(iv) Step 4: Define the objectives/ goals to be achieved by implementing BPA

Once the above steps have been completed, entity needs to determine the key objectives of the process improvement activities - SMART (Specific: Clearly defined, Measurable: Easily quantifiable in

monetary terms, Attainable: Achievable through best efforts, Relevant: Entity must be in need of these and Timely: Achieved within a given time frame.)

(v) Step 5: Engage the business process consultant

This is again a critical step to achieve BPA. To decide as to which company/ consultant to partner with depends upon the following:

- Objectivity of consultant in understanding/ evaluating entity situation.
- Does the consultant have experience with entity business process?
- Is the consultant experienced in resolving critical business issues?
- Whether the consultant is capable of recommending and implementing a combination of hardware, software and services as appropriate to meeting enterprise BPA requirements?
- Does the consultant have the required expertise to clearly articulate the business value of every aspect of the proposed solution?

(vi) Step 6: Calculate the Return on Investment (ROI) for project

The right stakeholders need to be engaged and involved to ensure that the benefits of BPA are clearly communicated and implementation becomes successful. Hence, the required business process owners have to be convinced so as to justify the benefits of BPA and get approval from senior management. Some of the methods for justification of a BPA proposal may include cost savings in terms of eliminating fines to be paid by entity due to delays, cost of audits and lawsuits and reduced cost of space regained from paper, file cabinets; reduction in required manpower leading to no new recruits; ensuring complete documentation for all new accounts; taking advantage of early payment discounts and eliminating duplicate payments; ensuring complete documentation for all new discounts; ensuring complete documentation for all new accounts; building business by providing superior levels of customer service and charging for instant access to records etc.

(vii) Step 7: Developing the BPA

Once the requirements have been document, ROI has been computed and top management approval to go ahead has been received the consultant develops the requisite BPA. The developed BPA needs to meet the objectives for which the same is being developed.

(viii) Step 8: Testing the BPA

Once developed, it is important to test the new process to determine how well it works and identify where additional "exception processing" steps need to be included. The process of testing is an iterative process, the objective being to remove all problems during this phase. Testing allows room for improvements prior to the official launch of the new process, increases user adoption and deceases resistance to change. Documenting the final version of the process will help to capture all of this hard work, thinking and experience which can be used to train new people.

4 *Risks*

Q.4.1	2017 - Nov [1] {C} (a)	Descriptive
Risks involved in implementing Business Process Automation. (2 marks)		

Answer:

Risks involved in implementing Business Process Automation		
1.	**Risk to Jobs**	Jobs that were earlier performed manually by several employees would post-automation would be mechanized, thereby posing a threat to jobs.
2.	**False Sense of Security**	Automating poor processes will not gain better business practices.

5 *Controls*

Q.5.1	2018 - May [1] {C} (e)	Descriptive
Explain the following in brief: Risk Assessment		(2 marks)

6 *Diagrammatic Representation of Business Processes*

Q.6.1	2010 - Nov [7] (c)	Descriptive
What is Program debugging ? Explain it briefly.		(2 marks)
OR	**2013 - May [7] (ii)**	**Descriptive**
Write short note on Program Debugging		(2 marks)

Answer :

Program Debugging :

It is a process of finding errors in program and rectifying them by using diagnostic routine before putting the program into use. There is a real necessity to debug a program, i.e. to cleanse it from errors. For this purpose, the programmers device a set of test data transactions to test the various alternative branches in the program. The results got from the computer are compared with one derived manually prior to computer processing. When the results do not match for any reason, the programmer then verifies the flowchart and coding sheet to hunt for the bugs. This process is called program debugging.

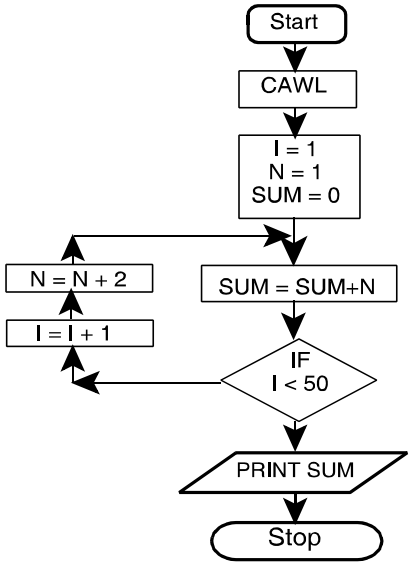
Q.6.2	2010 - Nov [5]	Descriptive

What do you mean by term flow chart? Draw a program flow chart to find the sum of first 50 odd numbers. (2 + 6 = 8 marks)

Answer :

- Flowchart is a diagram that shows sequence of steps required to solve a particular problem.
- It is a logical flow of steps which shows sequence of operations of a program by using symbols and inter-connectivity lines. It is like a blueprint that shows the general plan and essential details of the proposed structure.
- It allows the programmer to compare different approaches and alternatives on paper and often shows inter-relationships that are not immediately apparent.

The required flowchart to find the sum of first 50 odd numbers is drawn below :



Where CAWL means Clear All Working Locations

Q.6.3	2012 - Nov [7] (iii)	Objective
Describe briefly System Flow Chart		(2 marks)

Answer:

System Flowchart:

- System flowchart depicts the electronic flow of data and processing steps in Information systems.
- It is used by System Analysts to describe the data flow and operations for a data processing cycle.
- It defines the broad processing in the organizations.
- It shows the origin of data, filing structure, processing to be performed, output that is to be generated and necessity of any offline operation.

Q.6.4	2016 - Nov [6] (a)	Descriptive
What is a Data Flow Diagram. Explain the four major components of a Data Flow Diagram.		(4 marks)

Answer:

Types of Data Flow Diagrams (DFDs)		
There are two types of Data Flow Diagrams: 1. Logical Data Flow Diagram. 2. Physical Data Flow Diagram.		
1.	**Logical Data Flow Diagram**	A logical DFD focuses on the business and how the business operates. It describes the business events that take place and the data required and produced by each event. The logical model reflects the business.
2.	**Physical Data Flow Diagram**	A physical DFD shows how the system will be implemented. The physical model depicts the system.

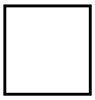
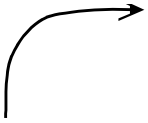
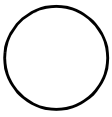
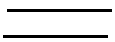
Major Component of DFD

Data Flow Diagrams

1. Concept of Data Flow Diagram (DFD):

- A Data flow diagram graphically describes the flow of data within an organisation. It is used to document existing system and to plan and design new ones. There is no ideal way to develop a DFD; different problems call for different methods. A DFD is composed of four basic elements : data sources and destinations, data flows, transformation processes, and data stores. Each is represented on a DFD by one of the symbols shown in figure given below.

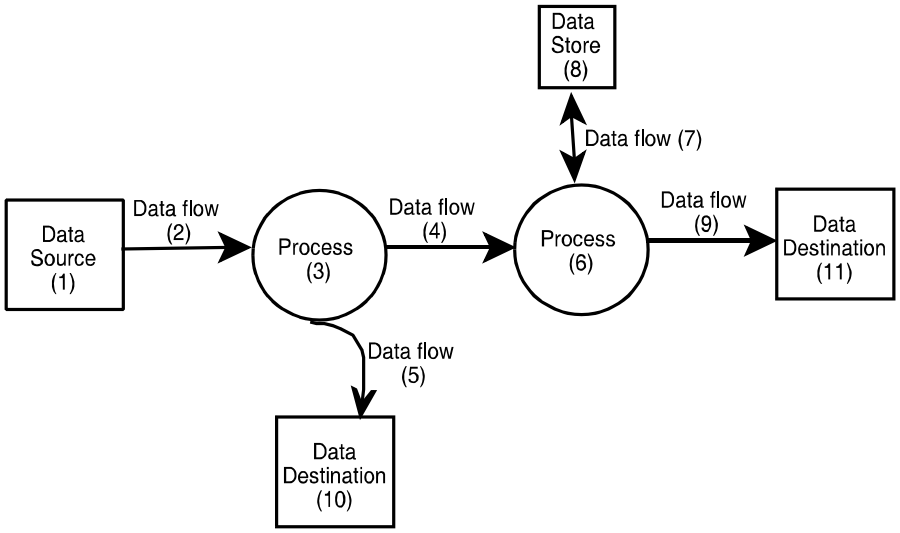
Data Flow Diagram Symbols

Symbol		Explanation
	Represent Data Sources and destinations	The people and organizations that send data to and receive data from the system are represented by square boxes. Data destinations are also referred to as data sinks.
	Represent Data flows	The flow of data into or out of a process is represented by curved or straight lines with arrows :
	Represent Transformation process	The processes that transform data from inputs to outputs are represented by circles. They are often referred to as bubbles.
	Represent Data stores	The storage of data is represented by two horizontal lines.

These four symbols are combined to show how data are processed

For Example :

In data flow



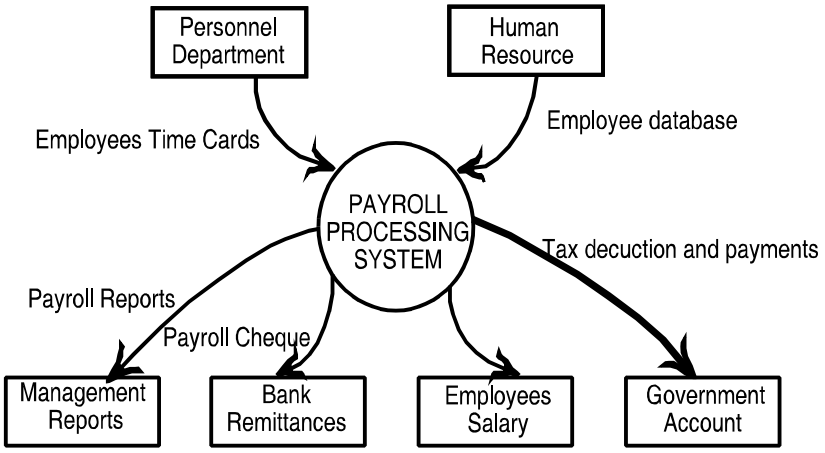
- Input to process (3) is data flow, (4) which comes from data source (1). The outputs of process (3) are data flows (4) and (5) Data flow (5) is sent to data destination (10). Process (6) uses data flow (4) and (7) as input and produces data flow (9) and (7) as output. Data flow (7) comes from and returns to data store (8). Data flow is sent to data destination (11).
- Above figure assigns specific titles to each of the processes depicted in symbols.
- These figures will be used to examine the four basic elements of a DFD in more detail.

2. Components of Data Flow Diagram :

(i)	**Data Flows**	• It represents the flow of data between processes, data stores, data source and destinations. • Data flow arrows are labelled to indicate the type of data being passed.

		• Data that pass between data stores and a data source/destination must go through some form of data processing, i.e. through a transformation process.
(ii)	**Data Source and Destinations**	• An entity can be both a Source and a Destination. • A source or destination symbol on the DFD represents an organisation or individual that sends or receives data used or produced by the system. • A Data Flow can consist of one or more pieces of datum. As data flow may be composed of more than one data element, it must be determined whether to show one or more lines. The determining factor is whether the data elements always flow together.
(iii)	**Processes**	• Process represent the transformation of data into information. • The output is sent to Data Stores or Data Destinations.
(iv)	**Data Stores**	• A Data Store is a temporary or permanent repository of data. • DFDs do not show the physical storage medium (disks, paper, etc.) used to store the data. • Like other DFD elements, Data Store names should be descriptive. • As in above figure, item (8) data store are represented by horizontal lines, with the data store's name recorded inside.

3. Sub-division of Data Flow Diagrams



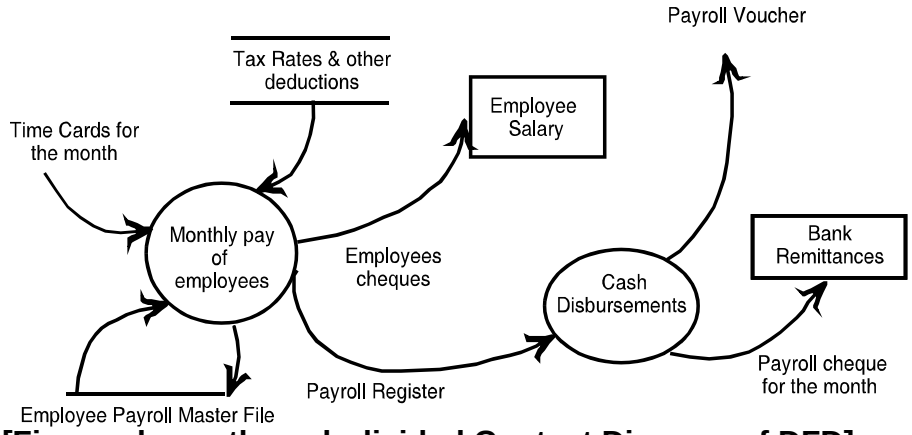
(i)	**Need for Sub-Division**	Data flow Diagrams are sub-divided into successively lower levels in order to provide increasing amount of detail. This is because only few systems can be fully diagramed on one sheet of paper. Moreover, different Users have different needs, and hence, various DFD levels covering each user area can only satisfy their requirements.
(ii)	**Context Diagram**	The highest-level DFD is referred to as a **Context Diagram**. A context diagram provides the reader with a summary level view of a system. It depicts a data processing system and the external entities that are the sources and destinations of the system's inputs and outputs.
(iii)	**An example Context Diagram**	is shown below. Example shows the payroll processing procedures. On an inference, it is understood that the Payroll Processing System receives time cards from the Personnel Department and employee data from the Human Resources Department.

		When these data are processed, the system produces: (a) Tax reports for payments into Government Account, (b) Employee pay cheques, (c) A cheque for the entire salary amount to be deposited in the Bank Account, and (d) Payroll Reports for submission to Management for review.

4. Sub-division of DFD: Sub-dividing the Context Diagram leads to modules of lesser levels.

In the aforesaid example, if preparation of employee pay cheques is taken as a lower level, the activities concerned with it will be represented by a separate sub-divided DFD. The sub-divided DFD for preparation of pay cheques will involve activities like computation of monthly pay, tax deductions, other deductions, recovery of advances, drawing up cheques in the employees name, preparation of payroll voucher and updation of the payroll Master File.

The process of sub - divided Data is represented below :



[Figure shows the sub-divided Context Diagram of DFD]

Q.6.5	RTP	Distinguish Between
Distinguish Between Data flow of DFD and Data store of DFD.		

Answer:

Data Flow of DFD: Data flow is the movement of data between the entity, the process and the data store. Data flow portrays the interface between the components of the DFD. The flow of data in a DFD is named to reflect the nature of the data used (these names should also be unique within a specific DFD). Data flow is represented by an arrow, where the arrow is annotated with the data name.

Data Store of DFD: A data store is where a process stores data between processes for later retrieval by that same process or another one. Files and tables are considered data stores. Data store names (plural) are simple but meaningful, such as “customers”, “orders” and “products”. Data stores are usually drawn as a rectangle with the right hand side missing and labeled by the name of the data storage area it represents, though different notations do exist.

Q.6.6	RTP	Descriptive
Discuss advantages and limitations of using Data Flow Diagram.		

Answer:

Advantages of using Data Flow Diagram (DFD)

1. It aids in describing the boundaries of the system.
2. It is beneficial for communicating existing system knowledge to the users.
3. A straightforward graphical tecnique which is easy to recognize.
4. DFDs can provide a detailed representation of system components.
5. It is used as the part of system documentation file.
6. DFDs are easier to understand by technical and nontechnical audiences
7. It supports the logic behind the data flow within the system.

Limitations of using Data Flow Diagram

1. It makes the programmers little confusing concerning the system
2. The biggest drawback of the DFD is that it simply takes a long time to create, so long that the analyst may not receive support from management to complete it.
3. Physical considerations are left out.

Q.6.7	2007 - Nov [4]	Practical

An electric supply company charges the following rates from its consumers :

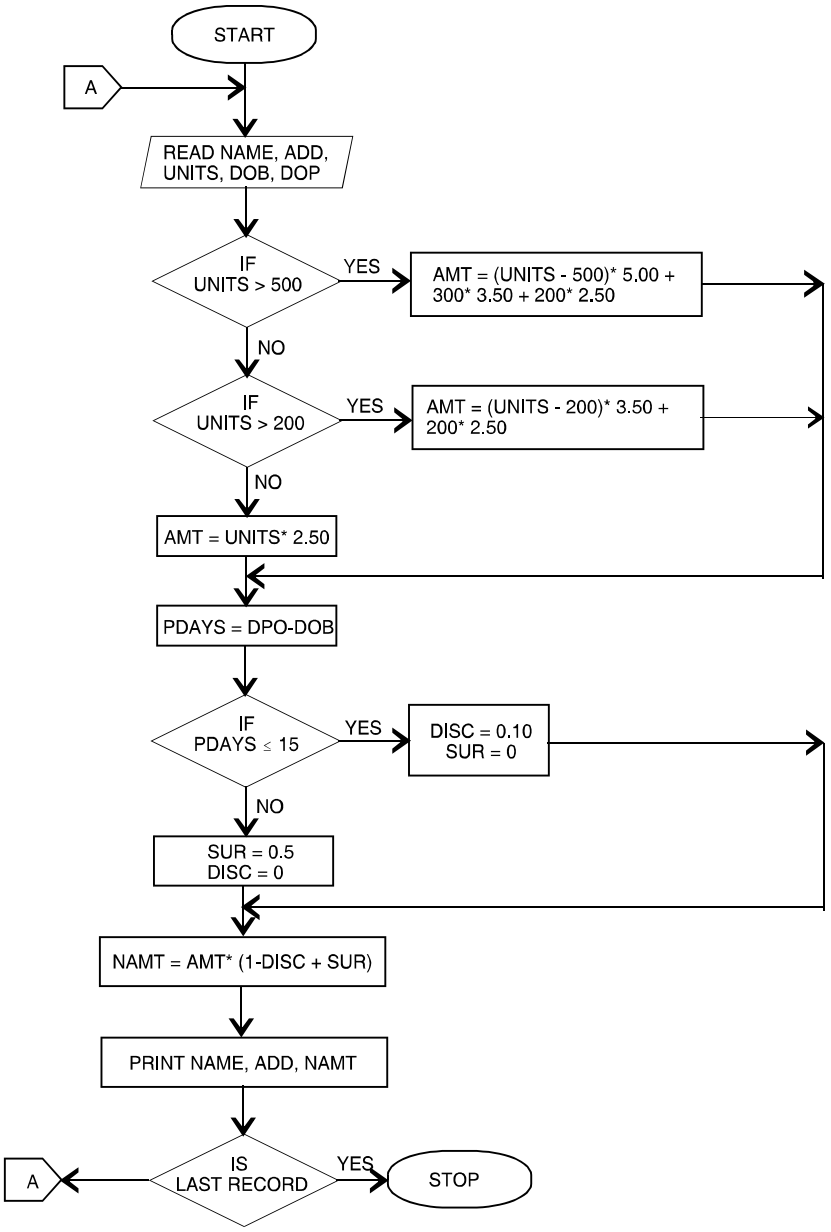
No. of unit consumed	Charges/unit (₹)
For the first 200 units	2.50
For the next 300 units	3.50
Over 500 units	5.00

Computer database of the company has the following information :

- Consumer Name
- Address
- Unit consumed
- Bill date
- Payment date

If the consumer pay his bill within 15 days from the bill date, 10% discount is given. If he makes the payment after 15 days from the bill date, 5% surcharge is levied. Draw a Flow chart to calculate the net amount of the bill for each consumer and print it. (10 marks)

Answer:


START
A
READ NAME, ADD, UNITS, DOB, DOP
IF UNITS > 500
YES
AMT = (UNITS - 500)* 5.00 + 300* 3.50 + 200* 2.50
NO
IF UNITS > 200
YES
AMT = (UNITS - 200)* 3.50 + 200* 2.50
NO
AMT = UNITS* 2.50
PDAYS = DPO-DOB
IF PDAYS ≤ 15
YES
DISC = 0.10 SUR = 0
NO
SUR = 0.5 DISC = 0
NAMT = AMT* (1-DISC + SUR)
PRINT NAME, ADD, NAMT
IS LAST RECORD
YES
STOP
A

Q.6.8	2008 - May [4]	Practical

A bicycle shop in a city hires bicycles by the day at different rates for different models as given below :

Model No.	Hire rate per day (₹)
Model No. 1	14.00
Model No. 2	12.00
Model No. 3	10.00

In order to attract customers, the shopkeeper gives a discount on the number of days a bicycle is hired for. The policy of discount is as given below :

No. of days	Discount rate (%)
1-5	0.00
6-10	8
11 and over	15

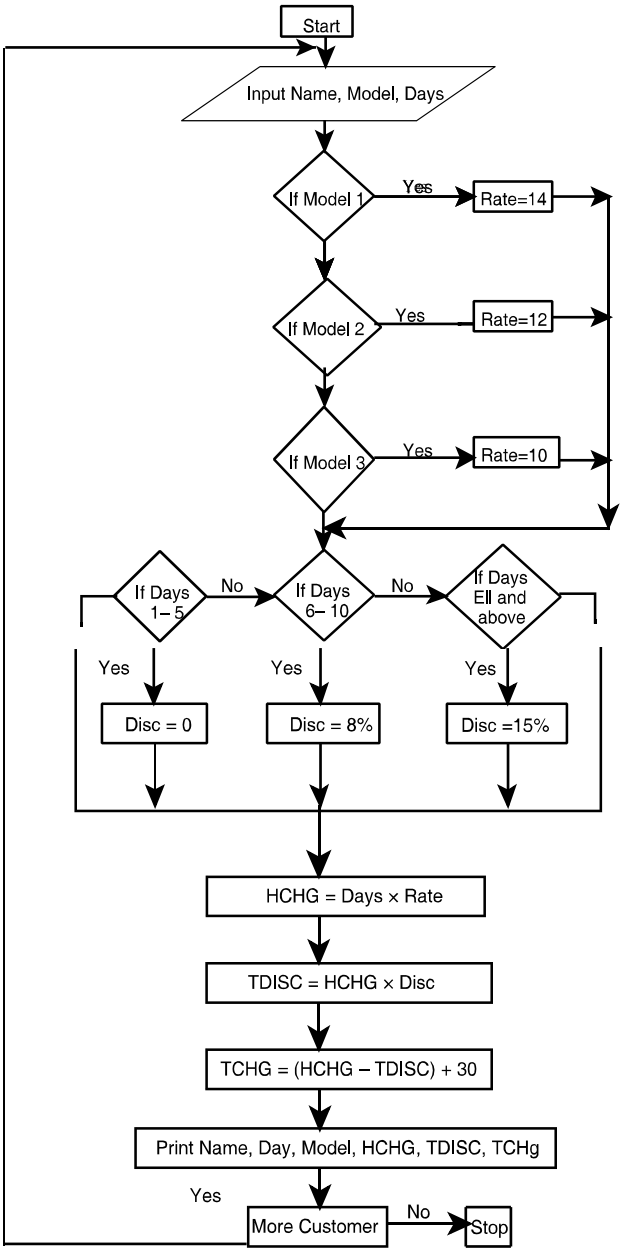
For every bicycle hired, a deposit of ₹ 30.00 must be paid.

Develop a flow chart to print out the details for each customer such as name of the customer, bicycle model number, number of days a bicycle is hired for, hire charges, discount and total charges including deposits.

(10 marks)

Answer:

Please see answer on next page


Start
Input Name, Model, Days
If Model 1
Yes
Rate=14
If Model 2
Yes
Rate=12
If Model 3
Yes
Rate=10
If Days 1– 5
No
If Days 6– 10
No
If Days Ell and above
Yes
Disc = 0
Yes
Disc = 8%
Yes
Disc =15%
HCHG = Days × Rate
TDISC = HCHG × Disc
TCHG = (HCHG – TDISC) + 30
Print Name, Day, Model, HCHG, TDISC, TCHg
Yes
More Customer
No
Stop

Q.6.9	2008 - Nov [4]	Practical

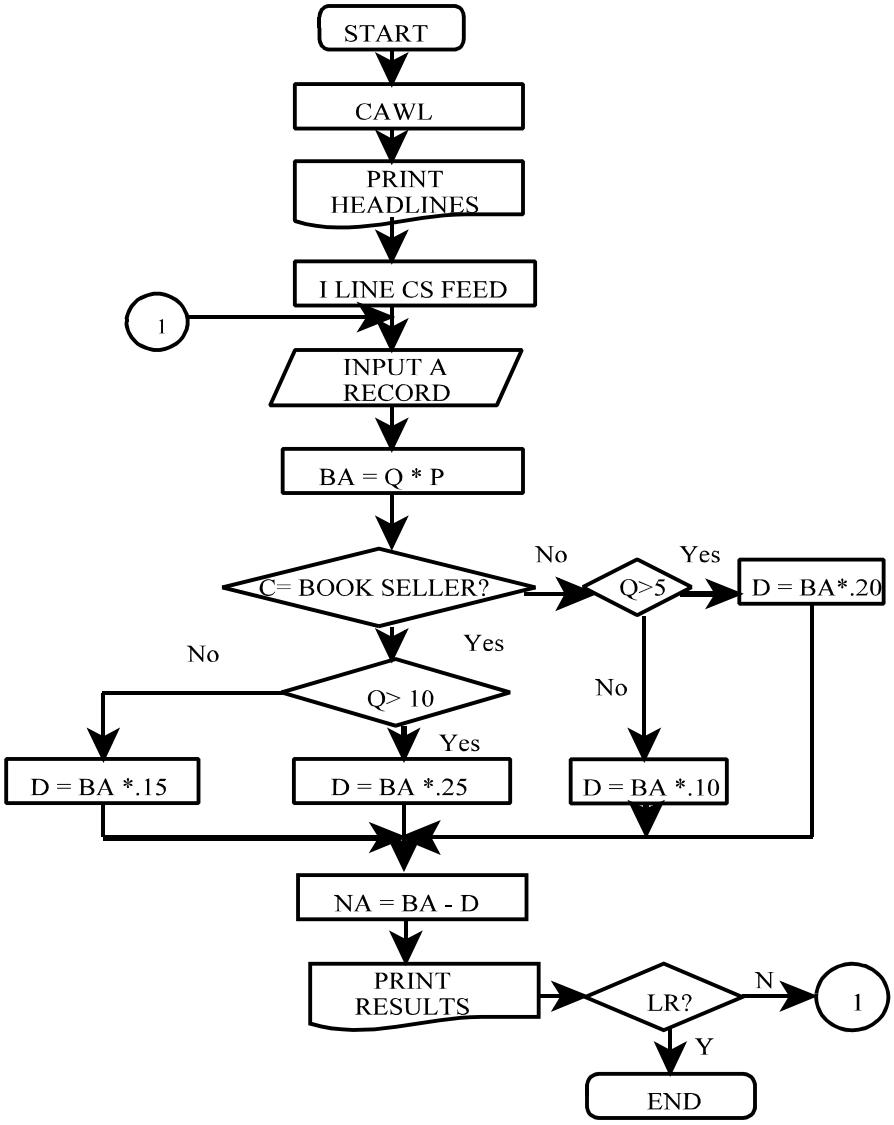
A Book publisher offers discount to customers on the basis of customer type and number of copies ordered as shown below:

Customer type	Number of Copies Ordered	% of Discount
Book Seller	More than 10	25
	Less than or equal to 10	15
	More than 5	20
Library	Less than or equal to 5	10

Customer number, name , type, book number, number of copies ordered and unit price are given as input. Draw a flow chart to calculate the net amount of the bill for each customer and print it.
The above is to be carried out for 50 customers. (10 marks)

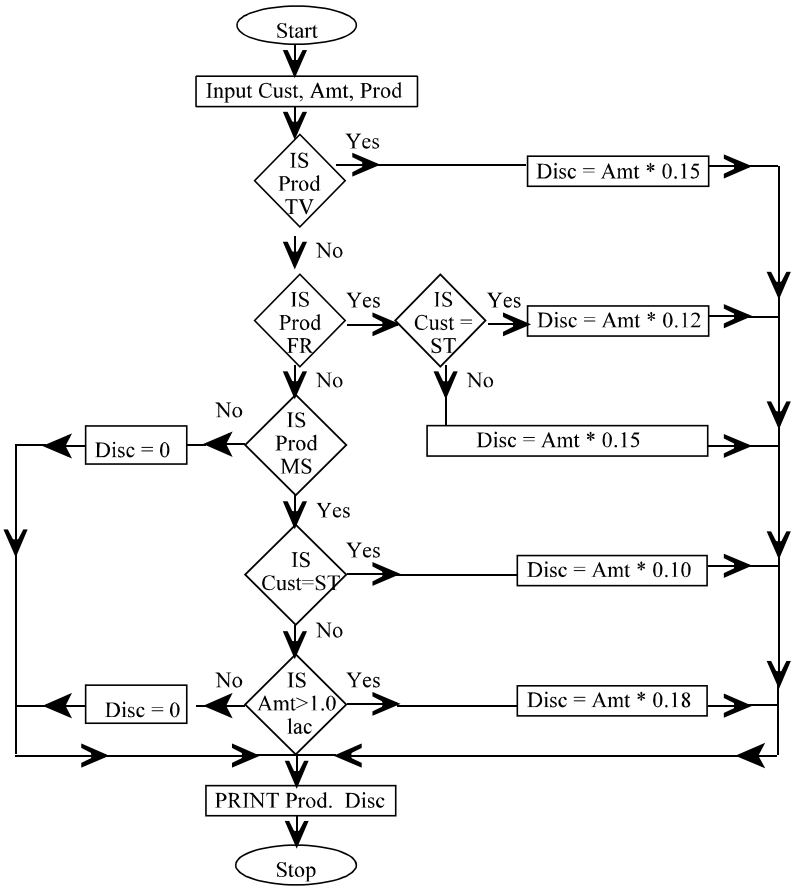
Answer:

Please see answer on next page


START
CAWL
PRINT HEADLINES
I LINE CS FEED
1
INPUT A RECORD
BA = Q * P
C= BOOK SELLER?
No
Q>5
Yes
D = BA*.20
No
Yes
Q> 10
No
Yes
D = BA *.15
D = BA *.25
D = BA *.10
NA = BA - D
PRINT RESULTS
LR?
N
1
Y
END

Q.6.10	2009 - May [4]	Practical

Frame the problem for which the given Flowchart has been drawn. See the Abbreviations defined below :



Cust. : Customer, **Prod :** Product, **Amt :** Amount, **Disc :** Discount, **TV :** Television, **FR :** Fridge, **MS :** Music System, **ST :** Student (10 marks)

Answer:

The problem relates to 'Discount Policy' of a company engaged in selling electronic items.

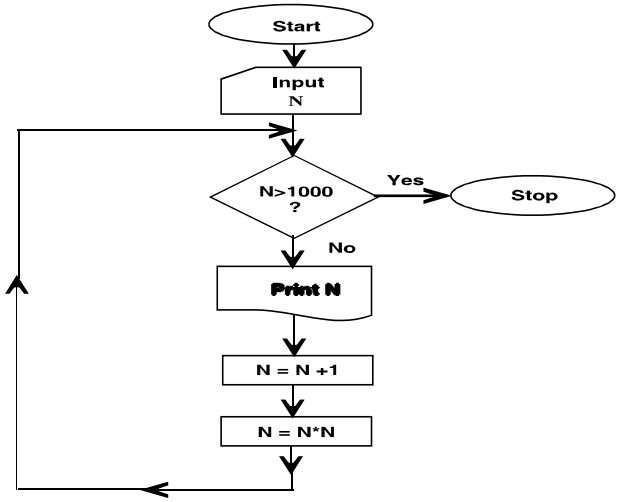
Item	Category of customer	Discount
TV	All	15%
Fridge	Student	12%*
	Others	15%*
Music System	Student	10%*
	Others	18%**

* irrespective of order value

* * subject to order value being more than ₹ 1 lakh.

Q.6.11	2009 - Nov [4] (a)	Practical

Write the output sequence (at least first five numbers) for the given flowchart, if N = 0 is selected as the value for N as input.



(5 marks)

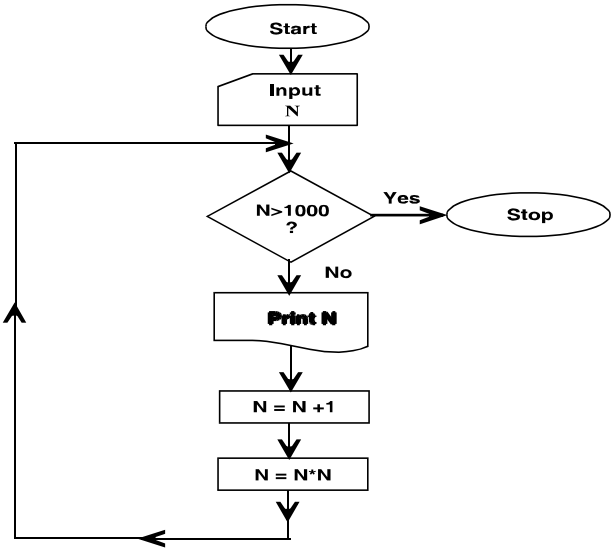
Answer :

If N = 0 then the output sequence will be :

0 1 4 25 676

Q.6.12	2009 - Nov [4] (b)	Practical

If the statement "N. = N * N" in the computation box of the flowchart is modified as "N = N * (N – 1)". Write the output sequence (at least first five numbers) for the flowchart with N = 0 as the input value for N.



(5 marks)

Answer:

If "N = N* N" is modified as "N = N* (–1)" with N = 0 as output, then the output sequence will be:

0 0 0 0 0

Q.6.13	2010 - May [4]	Practical

The Income-tax for the employees of an organization is calculated on the basis of their Gross Income and the Investments made by them, under Section 80CCC. The taxable income is calculated according to the following rules :

Taxable Income = Gross Income – Investments provided investments are less than 1 lac. Otherwise

Taxable Income = Gross Income – 1,00,000

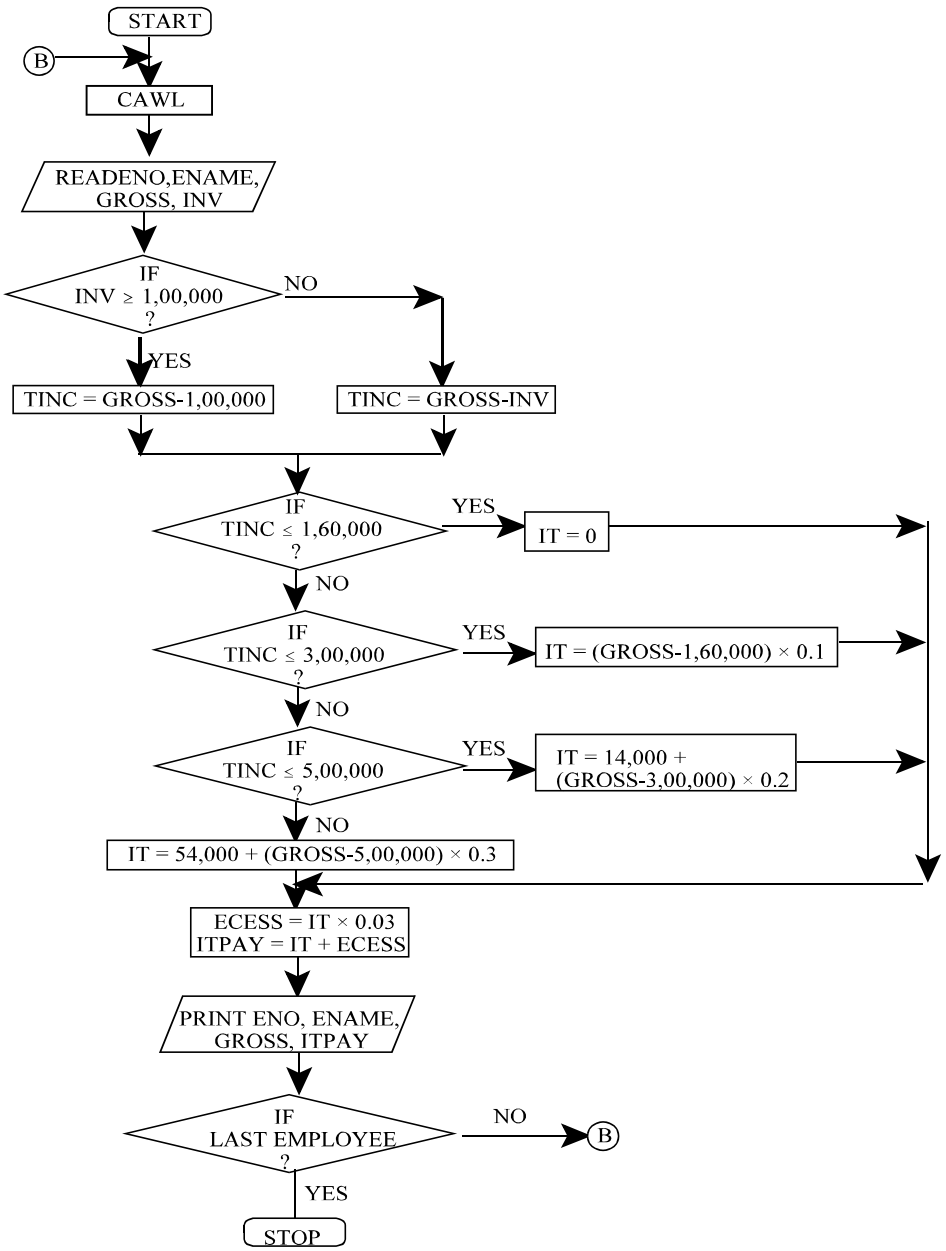
Following rules are applied to calculate the Income-tax, on the Taxable Income :

	Taxable Income	Income-tax
(i)	0 – 1,60,000	Nil
(ii)	1,60,001 – 3,00,000	10%, on the excess of 1,60,000
(iii)	3,00,001 – 5,00,000	14,000 + 20% on the excess of 3,00,000
(iv)	5,00,001 – and above	54,000 + 30% on the excess of 5,00,000

Also an educational cess of 3% of Income-tax is levied on all the employees, irrespective of the income.

Employee number, Name, Gross Income, Investment amount is given as input. Draw a flow chart to calculate the Income-tax payable by each employee. (10 marks)

Answer :


START
B
CAWL
READENO,ENAME, GROSS, INV
IF INV ≥ 1,00,000 ?
NO
YES
TINC = GROSS-1,00,000
TINC = GROSS-INV
IF TINC ≤ 1,60,000 ?
YES
IT = 0
NO
IF TINC ≤ 3,00,000 ?
YES
IT = (GROSS-1,60,000) × 0.1
NO
IF TINC ≤ 5,00,000 ?
YES
IT = 14,000 + (GROSS-3,00,000) × 0.2
NO
IT = 54,000 + (GROSS-5,00,000) × 0.3
ECESS = IT × 0.03
ITPAY = IT + ECESS
PRINT ENO, ENAME, GROSS, ITPAY
IF LAST EMPLOYEE ?
NO
B
YES
STOP

Terms used :
ENO = Employee Number
ENAME = Employee Name
GROSS = Gross Income
INV = Investment made
TINC = Taxable Income
IT = Income Tax
ECESS = Education Cess
ITPAY = Total Income Tax payable
CAWL = Clear All Working Locations

Q.6.14	2011 - May [5] (a)	Practical

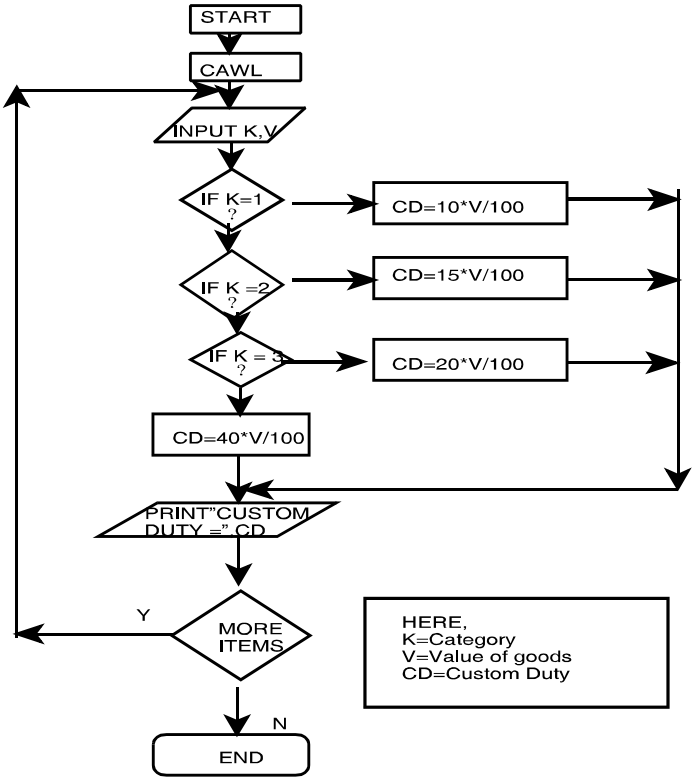
For computing custom duty, the imported items are classified into 4 categories. The rate of duty to be levied on each category of items is given below :

Category	Class of goods	% custom duty on the (K)value of goods (V)
1	Food and beverages	10
2	Textile and leather goods	15
3	Heavy machinery	20
4	Luxury items	40

Draw a flowchart to compute the custom duty. (4 marks)

Answer :

Please see answer on next page



Q.6.15	2011 - Nov [6], RTP	Practical

A housing society having 400 members pay electricity bills at the following rates :

No. of units consumed	Charges/unit (₹)
For the first 200 units	2.65
For the next 300 units	3.90
Over 500 units	4.75

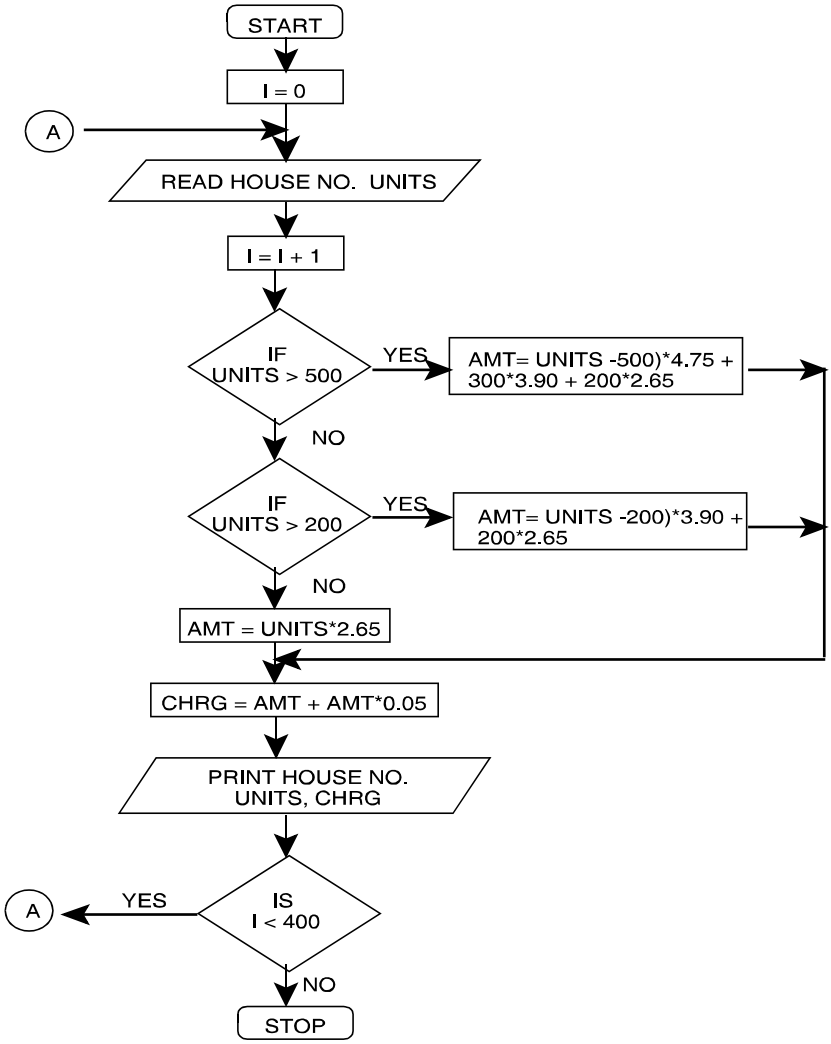
Surcharge @ 5% of the bill is to be added to the charges.

Draw a flow chart which will read the house number and the number of units consumed. Print the total charges with the house number and the units consumed. (8 marks)

Answer:

Abbreviations used :

House No. - House Number
Units - No. of units consumed
Amt - Amount
Chrg - Charges



Q.6.16	2012 - May [6]	Practical

For the flow chart given below:

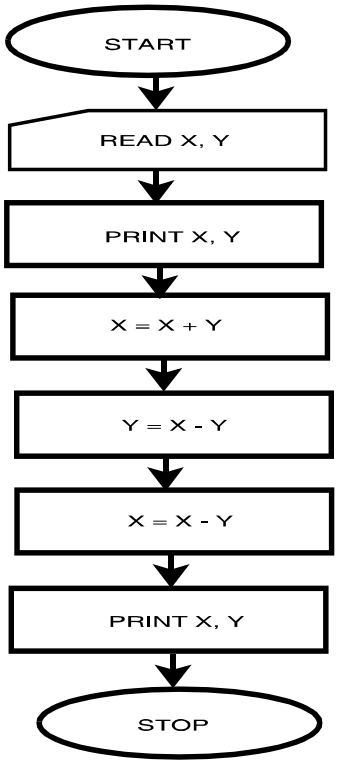
(a) Print the output displayed for using the given two sets of data:

		X	Y
1st Set	:	15	20
2nd Set	:	35	30

(4 marks)

(b) What interpretation do you make from the instructions given in the flow chart? (3 marks)

(c) Comment about the storage of the variables used in the instructions of the flow chart. (1 mark)



Answer:

(a) For first set, X=15, Y=20

Instruction	**Output**	
Read X, Y	15, 20	
Print X, Y	15, 20	.....1st Print
X = X + Y	X = 15 + 20 = 35	
Y = X - Y	Y = 35 - 20 = 15	
X = X - Y	X = 35 - 15 = 20	
Print X, Y	20, 15	.....2nd Print

1st Print 15 20
2nd Print 20 15

For second set, X = 35, Y = 30

Instruction	Output	
Read X, Y	35, 30	
Print X, Y	35, 30	.....1st Print
X = X + Y	X = 35 + 30 = 65	
Y = X - Y	Y = 65 - 30 = 35	
X = X - Y	X = 65 - 35 = 30	
Print X, Y	30, 35	.....2nd Print

1st Print 35 30
2nd Print 30 35

(b) The given set of instructions in the flow chart is the steps for swapping/interchanging the values of two variable without involving the third variable. As clearly interpreted from the output, the values of X and Y in the both the value sets have got interchanged.

Note: The interpretation involves two important factors:

(i) Interchange of values of two variables X and Y.

(ii) Without involving the third or temporary storage/variable.

(c) The comments about the storage of the variables used in the instructions of the flow chart are as follows

X = X + Y // The value of X has been assigned the value of (X+Y)...(i)

Y = X - Y // The value of Y has been assigned the value of (X-Y)..(ii)

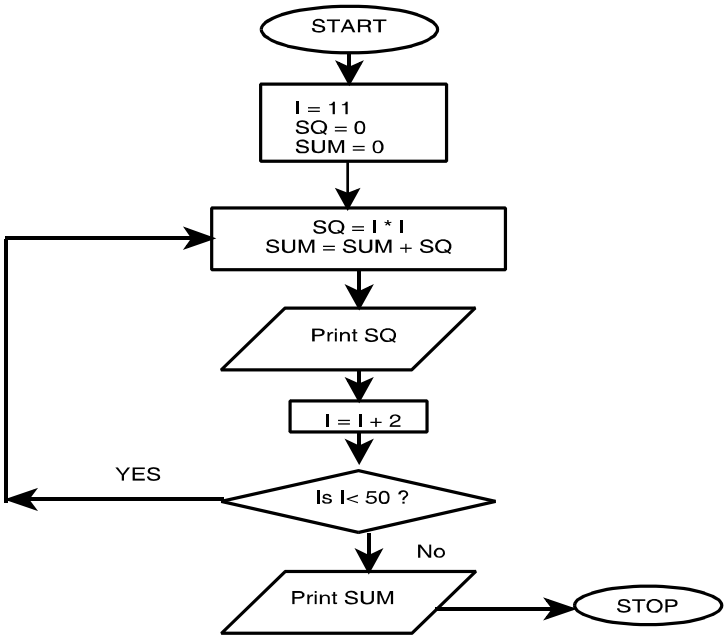
X = X - Y // The value of X has again been assigned the value of (X-Y), where the value of X and Y are calculated from the statement (i) and (ii)

Q.6.17	2012 - Nov [6]	Practical

Draw a flow chart to print the square of odd numbers between 10 to 50 and also print the sum of their square. (8 marks)

Answer:

The required flowchart is as follows:



I: Stores the value of odd number between 10 to 50 at each step.
SQ : Stores the calculated value of square of each odd number at each step.
SUM : Stores the sum of the squares of all the odd numbers till that step.

Q.6.18	2013 - May [6] (b)	Practical

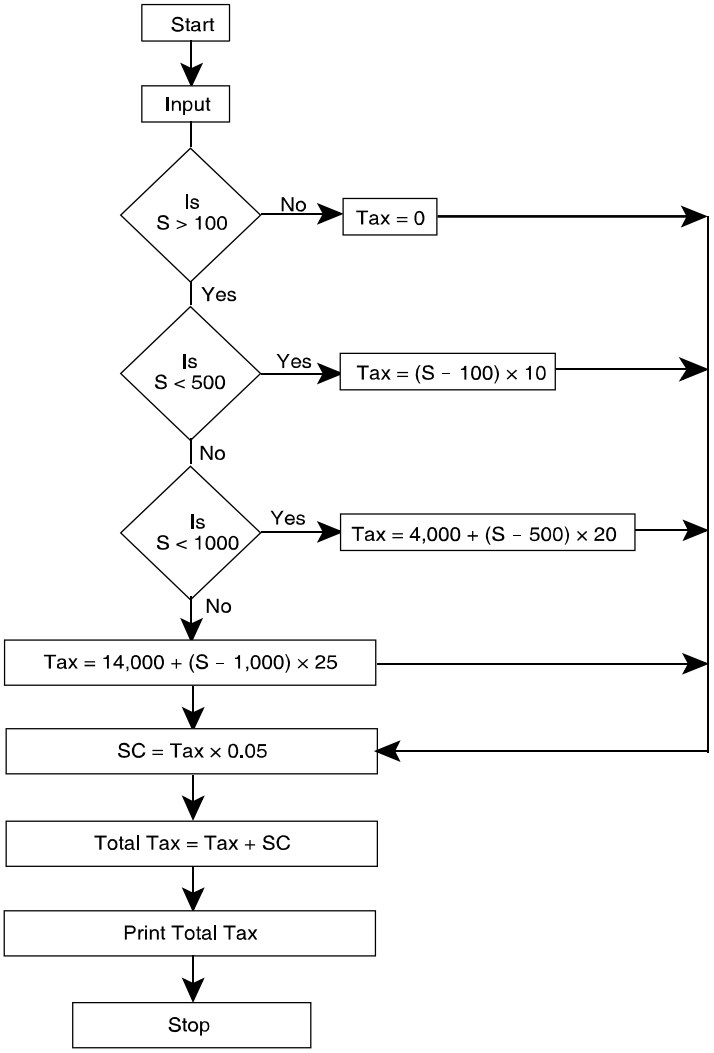
Top town Municipality, is levying annual House Tax, as per following rules:

Size of House in Sq. Metre	House tax rate per Square Metre
Less than 100	Nil
Upto Next 400	₹ 10

Upto Next 500	₹ 20
More than 1000	₹ 25

There is a surcharge of 5% of the value of House Tax. Taking into account the above factors, draw a flow chart to compute appropriate total House Tax including surcharge for any one house. (6 marks)

Answer:



Q.6.19	2013 - Nov [6]	Practical

A book publisher of Information Technology offers discount to its customers on the basis of customer type as detailed below:

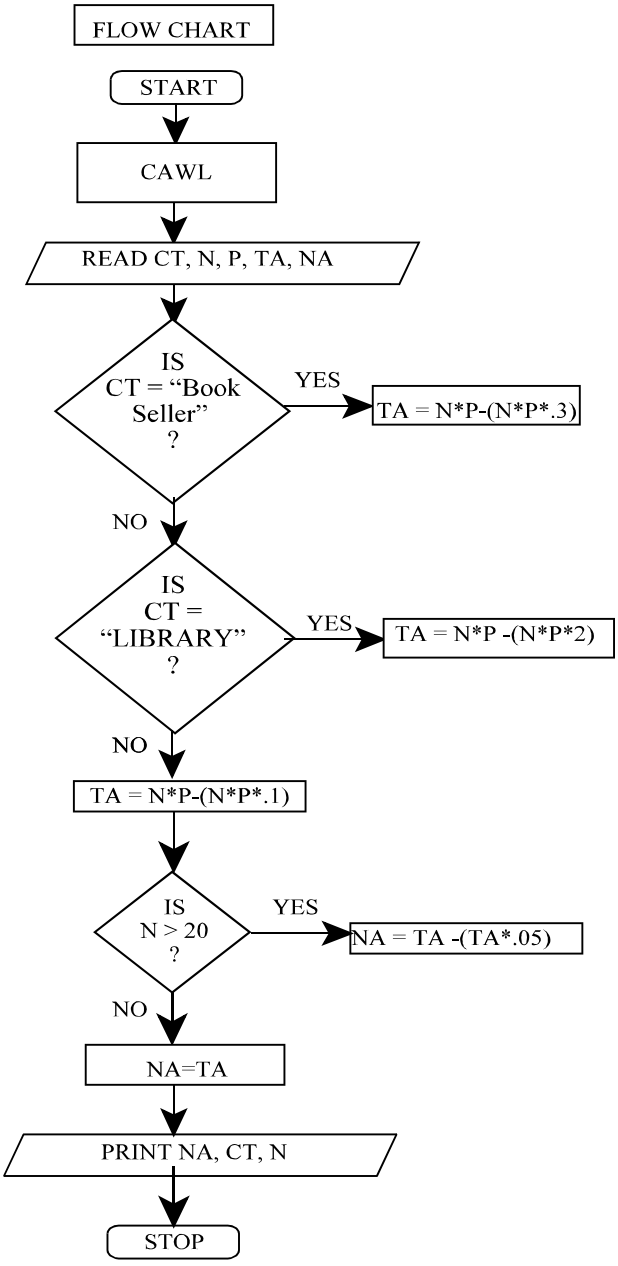
Customer Type	Discount
Book Seller	30%
Library	20%
Student	10%

Further if number of copies purchased is more than 20, then additional discount of 5% is allowed irrespective of customer type. Number of books, unit price of each book and customer type are given as input.

Draw a flow chart to calculate the net amount after all discount and print customer type, number of copies and net amount. (8 marks)

Answer:

Please see answer on next page


FLOW CHART
START
CAWL
READ CT, N, P, TA, NA
IS CT = "Book Seller" ?
YES
TA = N*P-(N*P*.3)
NO
IS CT = "LIBRARY" ?
YES
TA = N*P -(N*P*2)
NO
TA = N*P-(N*P*.1)
IS N > 20 ?
YES
NA = TA -(TA*.05)
NO
NA=TA
PRINT NA, CT, N
STOP

Q.6.20	2014 - May [6]	Practical

A Housing Society in a newly developed Smart City has provided several advanced security systems to each house in that city. Based on the value of these advanced security systems installed in each house, the Society has divided all the houses in four categories and fixed the criteria for annual maintenance charges as under:

House Category	Maintenance charges as % of value of advanced security systems installed at house
A	8%
B	6%
C	4%
D	3%

In addition to above there is a service tax @ 14.50% on the amount of maintenance charges. Considering house number and value of advanced security system installed, as input, draw a flow chart to have printed output as house number, maintenance charges, service tax and the total amount to be paid by each house owner. (8 marks)

Answer:

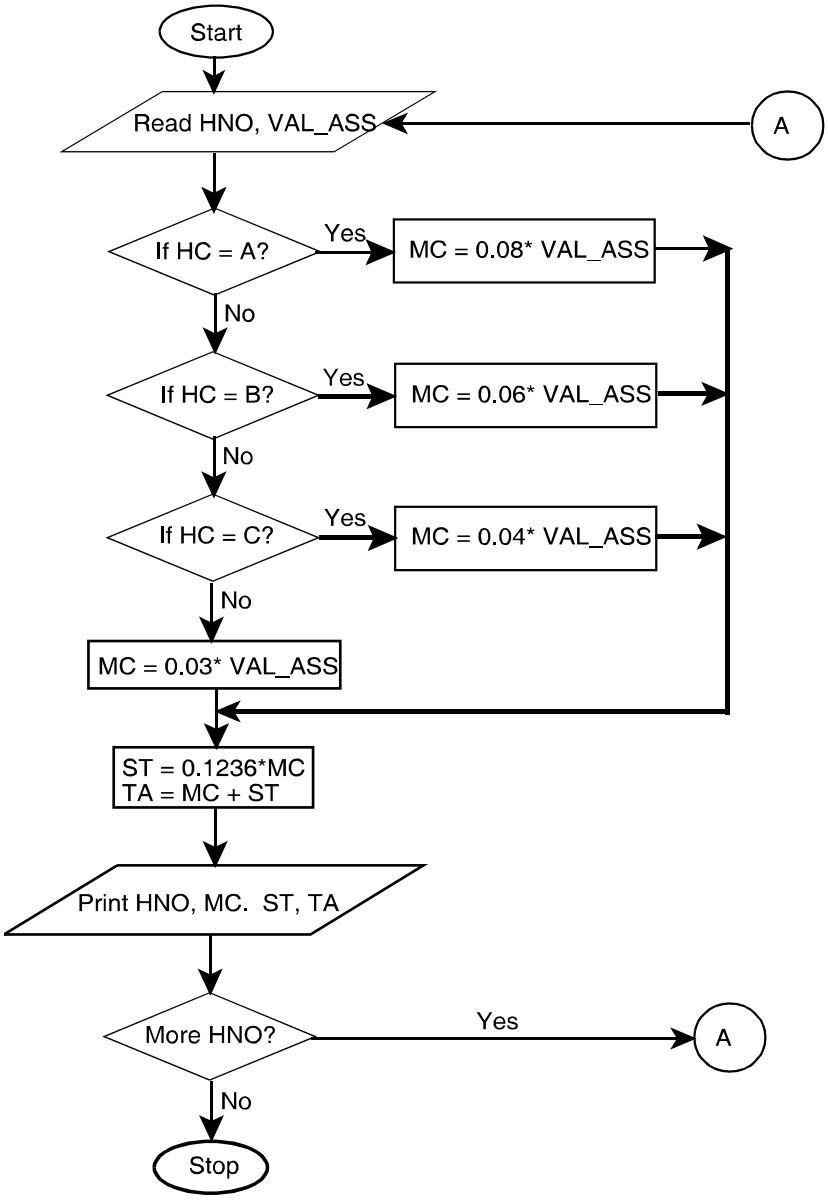
Let us define the variables first:

HNO: House Number HC: House Category

VAL ASS: Value of Advanced Security Systems

ST: Service Tax MC: Maintenance Charges

The desired flowchart is given as follows: TA: Total Amount


Start
Read HNO, VAL_ASS
A
If HC = A?
Yes
MC = 0.08* VAL_ASS
No
If HC = B?
Yes
MC = 0.06* VAL_ASS
No
If HC = C?
Yes
MC = 0.04* VAL_ASS
No
MC = 0.03* VAL_ASS
ST = 0.1236*MC
TA = MC + ST
Print HNO, MC. ST, TA
More HNO?
Yes
A
No
Stop

Q.6.21	2015 - May [2]	Practical

ABC Limited is a software development company, which appointed 50 software engineers in August' 2014 at a monthly salary of ₹ 30,000. All these engineers shall be entitled for an increment in their monthly salary after six months. The increment on present monthly salary shall be based on their performance to be evaluated on a 100 marks scale as per details given below:

– Performance Marks < 70, then increment shall be 10% of present salary.
– 70 ≤ Performance marks < 80, then increment shall be 20% of present salary.
– Performance Marks ≥ 80, then increment shall be 30% of present salary.

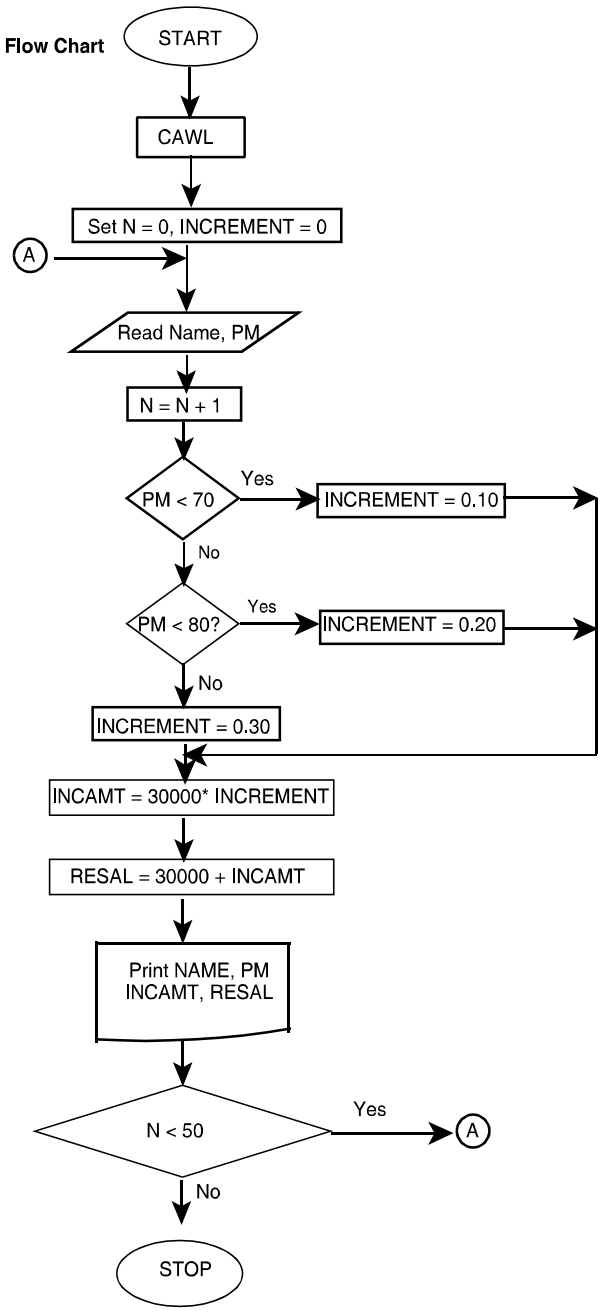
Draw a Flow-Chart to enable to print the details like name of the engineer, performance marks, monthly increment amount and revised monthly salary for each of these 50 engineers. (8 marks)

Answer:

Let us define the variables first:

PM: Performance Marks
RESAL: Revised Monthly Salary,
INCAMT: Increment Amount,
NAME: Name of Engineer,
N: Pointer to track number of Engineers,
INCREMENT = 0

Flow Chart


START
CAWL
Set N = 0, INCREMENT = 0
A
Read Name, PM
N = N + 1
PM < 70
Yes
INCREMENT = 0.10
No
PM < 80?
Yes
INCREMENT = 0.20
No
INCREMENT = 0.30
INCAMT = 30000* INCREMENT
RESAL = 30000 + INCAMT
Print NAME, PM
INCAMT, RESAL
N < 50
Yes
A
No
STOP

Q.6.22	2015 - Nov [2]	Practical

An E-Commerce site has the following cash back offers.

(i) If the purchase mode is via website, an initial discount of 10% is given on the bill amount.

(ii) If the purchase mode is via phone app, an initial discount of 20% is given on the bill amount.

(iii) If done via any other purchase mode, the customer is not eligible for any discount.

Every purchase eligible to discount is given 10 reward points.

(a) If the reward points are between 100 and 200 points, the customer is eligible for a further 30% discount on the bill amount after initial discount.

(b) If the reward points exceed 200 points, the customer is eligible for a further 40% discount on the bill amount after initial discount.

Taking purchase mode, bill amount and number of purchases as input, draw a flowchart to calculate and display the total reward points and total bill amount payable by the customer after all the discount calculation. (8 marks)

Answer:

Let us define the variables first:

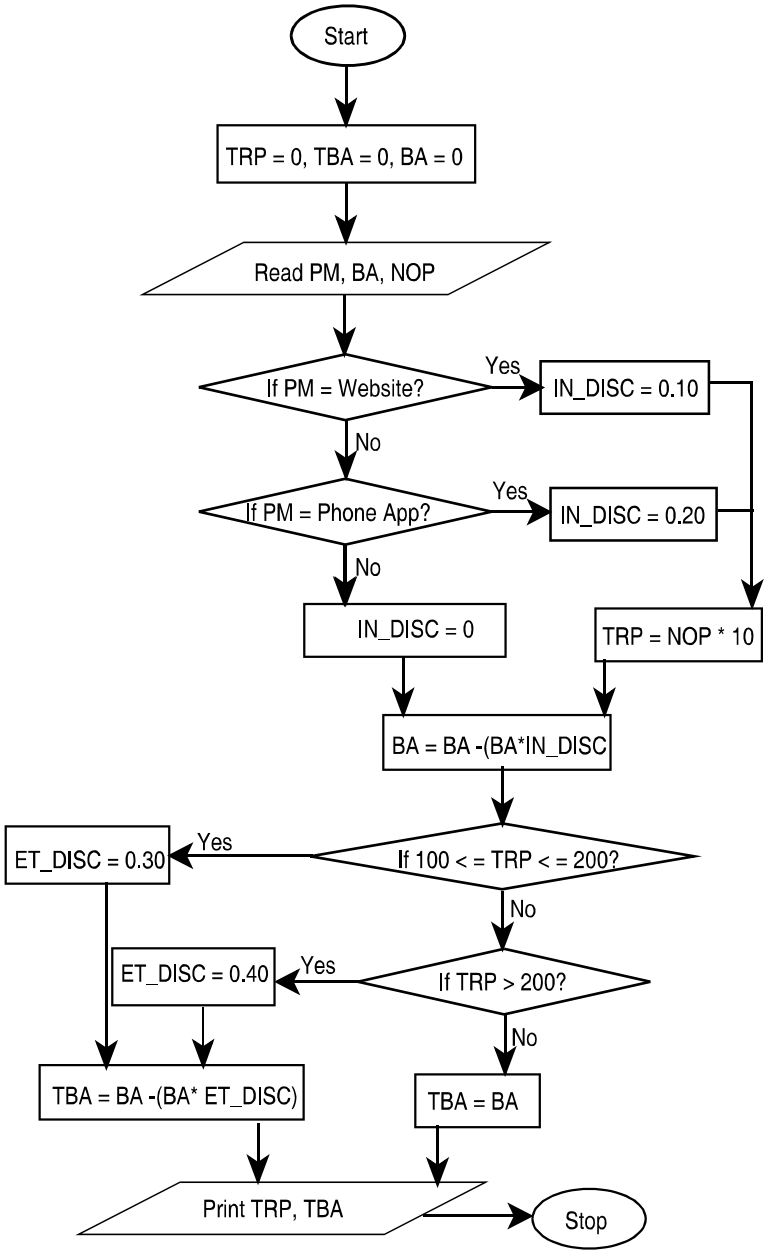
PM: Purchase Mode BA: Bill Amount TBA : Total Bill Amount

NOP: Number of Purchases TRP: Total Reward Points

IN_DISC: Initial Discount

ET_DISC: Extra Discount on purchases eligible to Initial Discount

N: Counter (to track the number of purchases)


Start
TRP = 0, TBA = 0, BA = 0
Read PM, BA, NOP
If PM = Website?
Yes
IN_DISC = 0.10
No
If PM = Phone App?
Yes
IN_DISC = 0.20
No
IN_DISC = 0
TRP = NOP * 10
BA = BA -(BA*IN_DISC
If 100 < = TRP < = 200?
Yes
ET_DISC = 0.30
No
If TRP > 200?
Yes
ET_DISC = 0.40
No
TBA = BA -(BA* ET_DISC)
TBA = BA
Print TRP, TBA
Stop

Q.6.23	2016 - Nov [5]	Practical

Draw a Flowchart for the following process:

Leebay is a new e-commerce website that is setting up business in India. Leebay and their partner bank Paxis have come up with a joint promotion plan for which the following offers are proposed.

Customers can either log in through a mobile app or directly from the website:

(1) If the payment mode chosen is 'Paxis Credit', then a 20% discount is given to the user.

(2) If the payment mode chosen is 'Paxis Debit', then a 10% discount is given to the user.

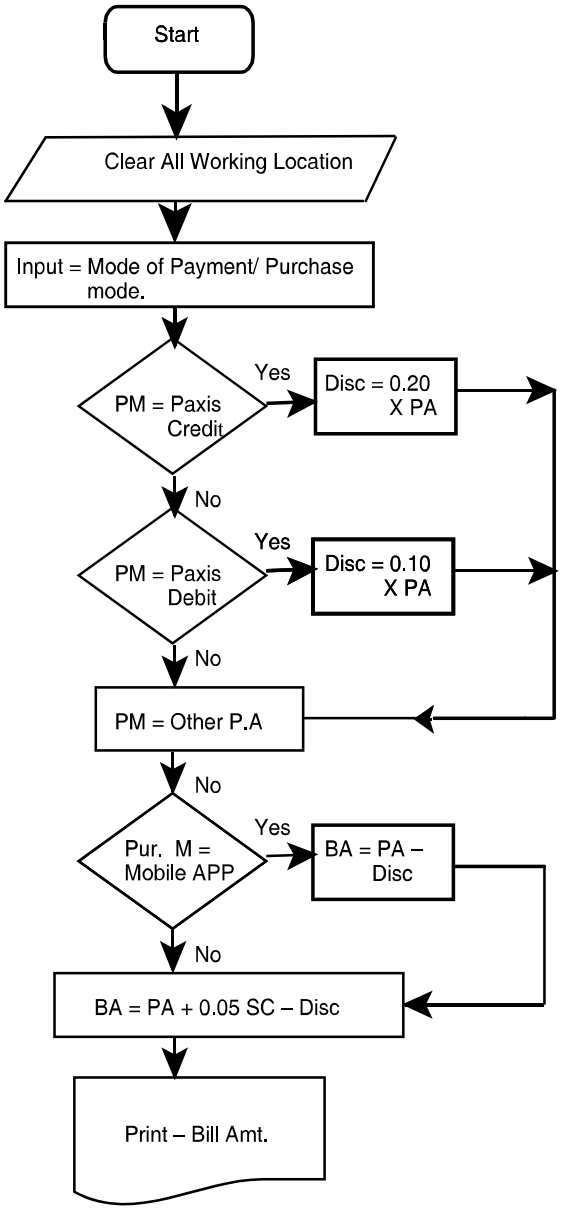
(3) If other payment modes are used, then no discount is given.

Also, to promote the downloads of its new smartphone app, the company has decided to give the following offer:

1. If the purchase mode is 'Mobile App', then no surcharge is levied on the user.
2. If any other purchase mode is used, then additional 5% surcharge is levied on the user. This surcharge is applied on the bill after all necessary discounts have been applied.

With bill amount, payment mode and purchase mode as inputs, draw a flowchart for the billing procedure for Leebay. (1 × 8 = 8 marks)

Answer:


Start
Clear All Working Location
Input = Mode of Payment/ Purchase mode.
PM = Paxis Credit
Yes
Disc = 0.20 X PA
No
PM = Paxis Debit
Yes
Disc = 0.10 X PA
No
PM = Other P.A
No
Pur. M = Mobile APP
Yes
BA = PA – Disc
No
BA = PA + 0.05 SC – Disc
Print – Bill Amt.

Q.6.24	2017 - May [2]	Practical

A company is selling three types of products, namely, A, B and C to two different types of customers viz. dealers and retailers. To promote the sales, the company is offering the following discounts:

(i) 10% discount is allowed on Product A, irrespective of the category of customers and the value of order.

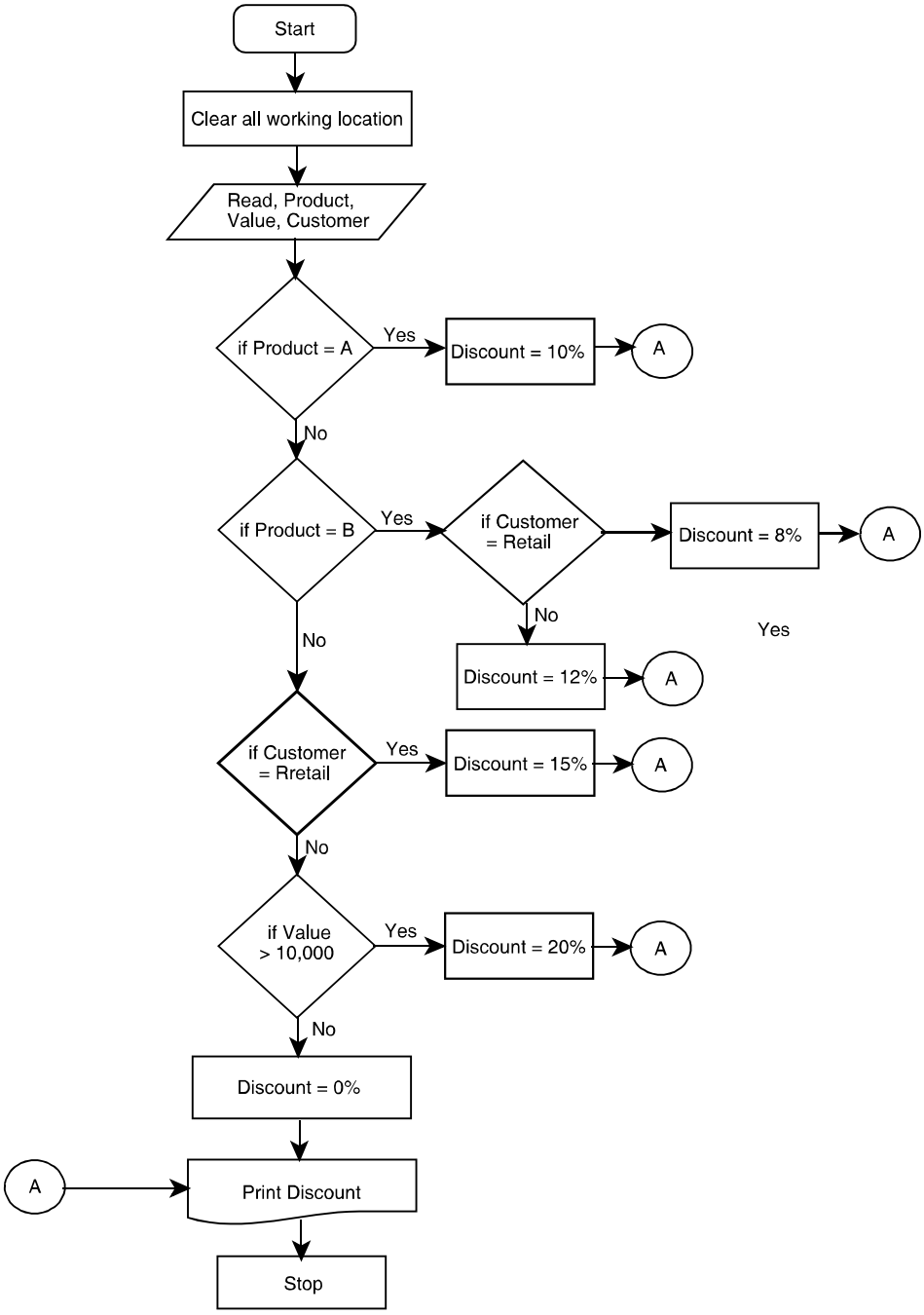
(ii) On product B, 8% discount is allowed to retailers and 12% discount to dealers, irrespective of the value of order.

(iii) On product C, 15% discount is allowed to retailers irrespective of the value of order and 20% discount to dealers if the value of order is minimum of ₹ 10,000.

Draw a flowchart to calculate the discount for the above policy.(8 marks)

Answer:

Please see answer on next page


Start
Clear all working location
Read, Product, Value, Customer
if Product = A
Yes
Discount = 10%
A
No
if Product = B
Yes
if Customer = Retail
Discount = 8%
A
No
Yes
No
Discount = 12%
A
if Customer = Rretail
Yes
Discount = 15%
A
No
if Value > 10,000
Yes
Discount = 20%
A
No
Discount = 0%
A
Print Discount
Stop

Q.6.25	2017 - Nov [6] (a) (b) (c)	Practical

(a) Draw a flow chart to incorporate for the following steps:

L1 N = 1
L2 PRINT N
L3 N = N × (N + 1)
L4 STOP when N exceeds 100
L5 GOTO L2

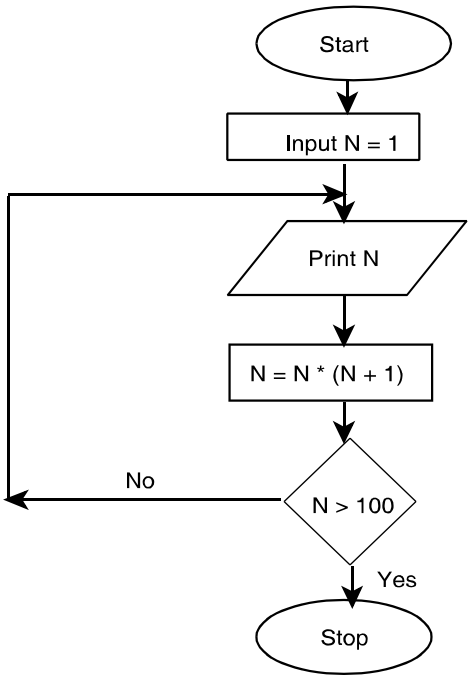
Note that in step L3, '×' denotes multiplication sign. (4 marks)

(b) List the output for the above program. (2 marks)

(c) List the output if the above program is modified in the step L1 as N= 0. (2 marks)

Answer:

(a)



(b) Output = 1, 2, 6, 42

(c) Output = O (it will continue as the loop doesn't end)

Q.6.26	2018 - May [5] (a)	Practical

An e-commerce website is offering following discounts:

- If the purchase mode is via website, a discount of 5% is given on the bill amount.
- If the purchase mode is via phone app, a discount of 10% is given on bill amount.
- If purchase is done via any other mode, customer is not eligible for any discount.

Draw a Flowchart to calculate and display the bill amount payable by the customer. (6 marks)

7 *Regulatory and Compliance Requirements: Information Technology Act (IT Act)*

Q.7.1	2007 - Nov [7] (a)	Short Notes

Write short note on the following :
Objectives of Information Technology Act, 2000. (5 marks) *[CA Final - II]*

Answer :

Objectives of Information Technology Act. (Amended Vide ITAA, 2008):	
To grant legal recognition to	• Transaction carried out through e-commerce. • Electronic Signature as a method of authentication of electronic documents/ transactions. • Book keeping in electronic form banks by amending Bankers' Book Evidence Act, 1891.
To facilitate	• Electronic filing of documents with government departments. • Electronic storage of data.

To facilitate and give legal recognition to	• Electronic funds transfer between banks and financial institutions by amending RBI Act, 1934.
To enable	• Electronic governance
To empower	• State/Central Government to intercept/monitor any information transmitted through any computer resource for investigation of any offence.
To provide for	• Protection of data security and privacy.
To deal with	• Electronic offences by amending Indian Panel Code, 1860 and Indian Evidence Act, 1872.

Q.7.2	**2018 - May [1] {C} (d)**	**Descriptive**
Explain the following in brief: Cyber Crime (2 marks)		

Q.7.3	**2018 - May [2] (b)**	**Descriptive**
Explain the positive aspects contained in the IT Act 2000 and its provisions, from the perspective of e-commerce in India. (4 marks)		