

Bandaranayake College- Gampaha
Information and Technology – Competency 7
(Past papers 2011 - 2020)
No - 06

2011 A/L

1. Which of the following best describes the order of the testing conducted in the software development process?
 - 1) Acceptance testing, integrated testing, unit testing.
 - 2) Integrated testing, acceptance testing, unit testing.
 - 3) Integrated testing, unit testing, acceptance testing.
 - 4) unit testing, acceptance testing, integrated testing.
 - 5) unit testing, integrated testing, acceptance testing.

2. Which of the following is a classification of systems?
 - 1) Close and hybrid
 - 2) Natural and structured
 - 3) Open and close
 - 4) Open and structured
 - 5) Structured and hybrid

3. A banking system could be best considered as a/an
 - 1) Embedded system.
 - 2) Enterprise resource planning system.
 - 3) Expert system.
 - 4) Knowledge management system.
 - 5) Transaction processing system.

Bandaranayake College- Gampaha
Information and Technology – Competency 7
(Past papers 2011 - 2020)
No - 06

4. Consider the following items:
- A. Object oriented
 - B. Rapid Application Development
 - C. Spiral
 - D. Structured
 - E. Waterfall

“....., and are system development methodologies”. Which of the above are most appropriate respectively to fill the blanks in the above statement?

- 1) A, B and C only
- 2) A, C and D only
- 3) B, C and D only
- 4) B, C and E only
- 5) B, D and E only

2012 A/L

5. Human blood circulatory system can be classified as a
- 1) Natural and closed system.
 - 2) Artificial and closed system.
 - 3) Artificial and open system.
 - 4) Natural and open system.
 - 5) Natural and artificial system.
6. Which of the following best describes a non-functional requirement of a mobile phone?
- 1) Sending a short message
 - 2) Receiving a telephone call
 - 3) Selecting a number from the contact list
 - 4) Making a telephone call
 - 5) Having one year warranty for the battery

Bandaranayake College- Gampaha
Information and Technology – Competency 7
(Past papers 2011 - 2020)
No - 06

7. An electronic washing machine can be best considered as a/an
- 1) Information system.
 - 2) Automated system.
 - 3) Expert system.
 - 4) Management support system.
 - 5) Transaction processing system.

2013 A/L

8. Which of the following can be considered as an expert system?
- 1) A bank teller machine
 - 2) A fully automated washing machine
 - 3) A microwave oven
 - 4) A diagnosis system of a health care facility
 - 5) An electronic blood pressure meter
9. Which of the following is a testing strategy which considers the internal implementation of a program into account?
- 1) Black box testing
 - 2) White box testing
 - 3) Integration Testing
 - 4) Acceptance testing
 - 5) Unit testing
10. Which of the following information system development models has an extremely short and linear development process?
- 1) Waterfall model
 - 2) Object – Oriented model
 - 3) Spiral model
 - 4) Incremental Development model
 - 5) Rapid Application Development model

Bandaranayake College- Gampaha
Information and Technology – Competency 7
(Past papers 2011 - 2020)
No - 06

11. Consider the following systems in a human body:

- A. Respiratory system
- B. Digestive system
- C. Nervous system
- D. Blood circulatory system

Which of the above are closed system?

- 1) A and B only
- 2) A and C only
- 3) B and C only
- 4) A and D only
- 5) C and D only

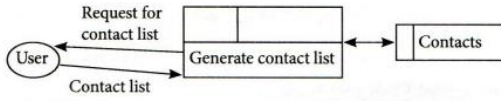
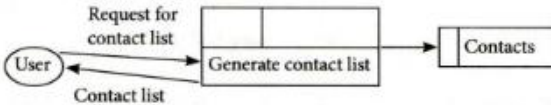
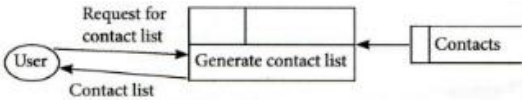
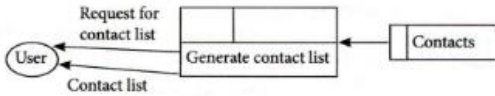
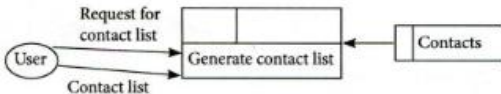
12. Which of the following statements best describes a non-functional requirement of a system?

- 1) A user shall be able to measure the blood pressure using an electronic blood pressure meter.
- 2) A microwave oven should not exceed its temperature above 400C°.
- 3) An electronic calculator should be able to compute square root of a given positive integer.
- 4) An Automatic Teller Machine of a bank shall be able to check the validity of an ATM card.
- 5) An internet banking system shall provide balance inquiry facility to its customers.

Bandaranayake College- Gampaha
Information and Technology – Competency 7
(Past papers 2011 - 2020)
No - 06

2014 A/L

13. The Pilot, Phase, Direct and Parallel are four different kind of system strategies.
Which of the following is most appropriate to fill the blank in the above statement?
- 1) Analysis
 - 2) Design
 - 3) Testing
 - 4) Implementation
 - 5) Maintenance
14. Which of the following segment of a Data Flow Diagram best represents the process of getting the contact list of a mobile phone?

- 1) 
- 2) 
- 3) 
- 4) 
- 5) 

Bandaranayake College- Gampaha
Information and Technology – Competency 7
(Past papers 2011 - 2020)
No - 06

15. Consider the following systems:

- A. Human blood circulatory system
- B. Human digestive system
- C. Human nervous system

The system(s) that can be considered as open system(s) is/are

- 1) A only
- 2) B only
- 3) C only
- 4) A and B only
- 5) A and C only

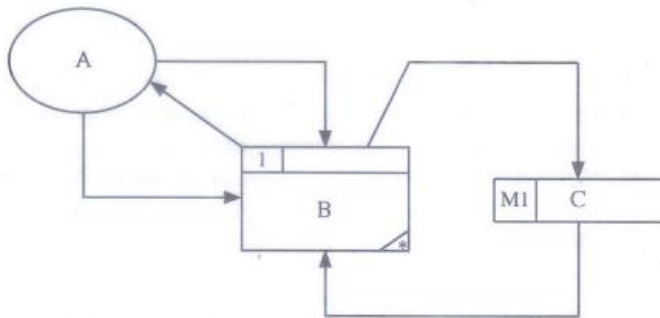
2015 A/L

16. Consider the following statement regarding an Automatic Teller Machine (ATM) of a bank: “System shall dispense cash in less than 10 seconds.” Which of the following is correct with respect to the above statement?

- 1) This is an essential non-functional requirement.
- 2) This is a nice to have non-functional requirement.
- 3) This is an essential functional requirement.
- 4) This is a nice to have functional requirement.
- 5) This is not a requirement of a system.

Bandaranayake College- Gampaha
Information and Technology – Competency 7
(Past papers 2011 - 2020)
No - 06

17. Consider the following Data Flow Diagram:



According to the Structured System Analysis and Design Methodology (SSADM), the components A, B and C in the above diagram represent respectively.

- 1) An external entity, a process and a data flow
 - 2) A process, an entity and a data store
 - 3) A user, a process and a table in an electronic database
 - 4) A user, a function and a table in an electronic database
 - 5) An external entity, a process and a data store
18. Which of the following statements is correct with respect to openness and closeness of a system?
- 1) An automatic Teller Machine of a bank should be a close system.
 - 2) A general-purpose computer can be considered as an open system.
 - 3) Human blood circulatory system is an open system.
 - 4) A mobile phone is a close system.
 - 5) A solar power generation system is a close system.

Bandaranayake College- Gampaha
Information and Technology – Competency 7
(Past papers 2011 - 2020)
No - 06

2016 A/L

19. Consider the following system implementation methods:

- A. Direct
- B. Phase
- C. Parallel

Which of the above methods can be recommended to implement an emergency call handling system?

- 1) A only
- 2) B only
- 3) C only
- 4) A and B only
- 5) A and C only

20. Which of the following statements is an example for an essential non-functional requirement of an Internet banking system?

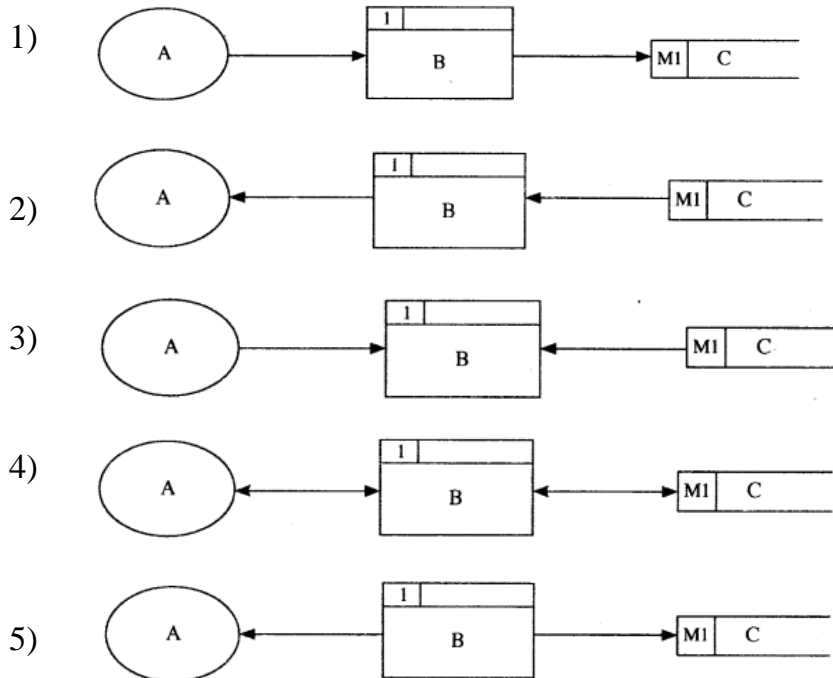
- 1) System shall facilitate its users to open accounts.
- 2) System shall facilitate its users to check account balance.
- 3) System shall use a 256-bit encryption for all communications.
- 4) System should facilitate its users to order cheque books.
- 5) System should be able to render information on all popular web browsers.

21. Which of the following is the most appropriate example for a **manual temporary** data store?

- 1) A file tray
- 2) A cardboard file
- 3) A file cabinet
- 4) A data file in a hard disk
- 5) A temporary data file in a hard disk

Bandaranayake College- Gampaha
Information and Technology – Competency 7
(Past papers 2011 - 2020)
No - 06

22. Which of the following **high-level** data flow diagrams is correct with respect to the rules on data flow modelling?



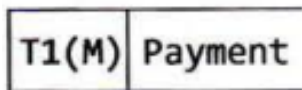
23. Which of the following is correct about open system?

- 1) All inputs required for an open system is available within the system itself.
- 2) Open systems cannot interact with other systems.
- 3) Open systems do not need other systems for its operations.
- 4) Humans can make open systems.
- 5) All the natural systems are open systems.

Bandaranayake College- Gampaha
Information and Technology – Competency 7
(Past papers 2011 - 2020)
No - 06

2017 A/L

24. Which of the following statements best describes a nice to have non-functional requirement of an Automated Teller Machine (ATM)?
- 1) System shall facilitate users to withdraw money.
 - 2) System should let users to deposit money.
 - 3) System shall use 256 -bit encryption for all communications.
 - 4) System should provide users a touch screen interface.
 - 5) System shall dispense money within 5 seconds.
25. The following symbol, appeared in a Data Flow Diagram (DFD) of a Sales Information System, represents a Containing payment details.

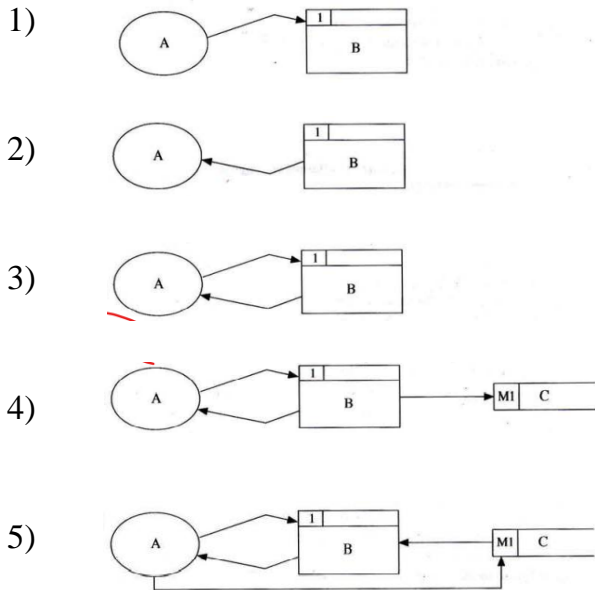


Which of the followings is most appropriate to fill in the blank in the above statement?

- 1) File tray
- 2) Cardboard file
- 3) File cabinet
- 4) Data file in a hard disk
- 5) Temporary data file in a hard disk

Bandaranayake College- Gampaha
Information and Technology – Competency 7
(Past papers 2011 - 2020)
No - 06

26. Which of the following dataflow diagrams is correct with respect to the rules of dataflow modelling?



27. Requirements of a system can be classified as Mandatory (Essential), desirable (Optional), Functional and Non-functional.

“ATM of a bank shall not allow more than three attempts to enter a user’s secret number incorrectly”

Which of the followings correctly classifies the above requirement?

- 1) Mandatory, Functional
- 2) Mandatory, Non-functional
- 3) Desirable, Functional
- 4) Desirable, Non-functional
- 5) Mandatory or Desirable, Functional

Bandaranayake College- Gampaha
Information and Technology – Competency 7
(Past papers 2011 - 2020)
No - 06

28. Which of the following organs is a part of a closed system of the human body?

- 1) Eye
- 2) Ear
- 3) Heart
- 4) Kidney
- 5) Lung

29. Consider the following system implementation methods:

- A. Direct
- B. Pilot
- C. Parallel

Which of the above method(s) is/are generally used to implement a home security system?

- 1) A only
- 2) B only
- 3) C only
- 4) A and B only
- 5) A and C only

Bandaranayake College- Gampaha
Information and Technology – Competency 7
(Past papers 2011 - 2020)
No - 06

2018 A/L

30. Consider the following tasks

- A. Identifying the problems in the existing system
- B. Suggesting alternative solutions
- C. Prioritizing of the information system's requirements

Which of the above tasks is /are carried out during the preliminary investigations of systems development life cycle?

- 1) A only
- 2) A and B only
- 3) A and C only
- 4) B and C only
- 5) All A, B and C

31. Which of the following feasibility types is generally not carried out during the development of a system to be used only in-house?

- 1) Economic feasibility
- 2) Market feasibility
- 3) Operational feasibility
- 4) Organizational feasibility
- 5) Technical feasibility

Bandaranayake College- Gampaha
Information and Technology – Competency 7
(Past papers 2011 - 2020)
No - 06

32. Consider the following statements regarding functional and non-functional requirements of a sales system.

- I. Reads barcodes of items purchased and produces the invoice
- II. Accepts user's request and responds in less than 1 second
- III. Processes a minimum of 1000 transactions per second

Which of the following is the correct classification of requirements?

- 1) I, II and III all functional
- 2) I-functional, II and III – non-functional
- 3) II – functional, I and III – non – functional
- 4) I and III-functional, II-non-functional
- 5) I, II and III all non-functional

33. Consider the following software development lifecycle models.

- A. Spiral
- B. Waterfall
- C. Rapid Application Development (RDA)

Which of the above requires defining and finalizing requirements in the early phases of the lifecycle?

- 1) A only
- 2) B only
- 3) A and B only
- 4) A and C only
- 5) B and C only

Bandaranayake College- Gampaha
Information and Technology – Competency 7
(Past papers 2011 - 2020)
No - 06

34. Consider the following statements regarding Structured and Object-Oriented software development methodologies.

- A. Structured analysis and design represent systems as a hierarchy of functions.
- B. Structured design is a system of interacting objects.
- C. Object oriented methodology combines data and processes into individual entities.

Which of the above statements is/are correct?

- 1) A only
- 2) A and B only
- 3) A and C only
- 4) B and C only
- 5) All A, B and C

2019 A/L

35. Which of the following shows the correct order of software testing?

- 1) Acceptance testing → System testing → Integration testing → Unit testing
- 2) Unit testing → Acceptance testing → System testing → Integration testing
- 3) Unit testing → Integration testing → Acceptance testing → System testing
- 4) Unit testing → Integration testing → System testing → Acceptance testing
- 5) White-box testing → black-box testing → System testing → Acceptance testing
- 6) White-box testing → black-box testing → System testing → Unit testing

36. A software development company identifies that their new system development project has complex requirements and has a medium to high risk level. Further, an evaluation is needed to clear the requirements and significant changes are expected during system development. What is the most suitable software development process model for this project?

- 1) Agile
- 2) Prototyping
- 3) Rapid application development
- 4) Spiral
- 5) Waterfall

Bandaranayake College- Gampaha
Information and Technology – Competency 7
(Past papers 2011 - 2020)
No - 06

37. Which of the following indicates a non-functional requirement?

- A. A user shall be allowed to upload an image to the system to be used as his/her profile picture.
- B. The correct invoice values should be calculated including applicable tax rates at the check-out.
- C. The system must satisfy 99.9% availability of service.

- 1) A only
- 2) B only
- 3) C only
- 4) A and B only
- 5) All A , B and C

38. What is the correct statement related to system deployment?

- 1) Direct deployment is the most complex and the slowest form of deployment.
- 2) In pilot deployment, all the users have the ability to use the system at the beginning.
- 3) In parallel deployment old and new systems are used at the same time.
- 4) Phased deployment does not allow users to develop skills required for new system gradually.
- 5) Phased deployment means the entire system is used in one location.

2020 A/L

39. Which of the following statement/s regarding the testing of a system are correct?

- A. Black-box testing involves detailed checking of each line in the code.
- B. Unit-testing helps to uncover errors in the codes.
- C. System testing should not be performed prior to unit-testing.

- 1) A only
- 2) B only
- 3) C only
- 4) A and C only
- 5) B and C only

Bandaranayake College- Gampaha
Information and Technology – Competency 7
(Past papers 2011 - 2020)
No - 06

40. Which of the following indicate functional requirements?

- A. The users should be allowed to update their contact addresses and phone numbers.
- B. Any user request must be responded within 2ms.
- C. The system must be easy to change.

- 1) A only
- 2) B only
- 3) C only
- 4) A and C only
- 5) All A, B and C

41. The following details are given about a software project:

- A. Requirements are fixed (not allowed to change throughout the complete project)
- B. Must deliver the complete software product at once
- C. Detailed descriptions and specifications must be prepared for each activity within the project

What is the most suitable software process model for this project?

- 1) Agile
- 2) Prototype
- 3) Rapid Application Development
- 4) Spiral
- 5) Waterfall

42. Which of the following statements on Data Flow Diagrams (DFD) is incorrect?

- 1) Context diagram is a DFD with the highest level of abstraction.
- 2) All data stores in a system must be represented in the context diagram.
- 3) Data flows are used to link the other components in DFDs.
- 4) Elementary processes are not decomposed further.
- 5) External entities in DFDs act as sources or recipients of data.

Bandaranayake College- Gampaha
Information and Technology – Competency 7
(Past papers 2011 - 2020)
No - 06

2011 A/L

4. (a) Identify and describe the phases of the waterfall model in software development.
(b) Describe functional and non functional requirements of a system. Identify **two functional** and **three non functional** requirements for a mobile phone.
(c) Describe the purpose of unit, integrated and acceptance testing. Who are the people responsible for each testing process?
(d) Suppose you are planning to buy a new mobile phone and would like to test its functionality. Describe how Black Box testing can be used in this process.

2012 A/L

2.

- (a) Provide a suitable definition for a system.
(b) Using the definition suggested in (a) above, show that a mobile phone is a system.
(c) State whether a mobile phone is a close system or an open system. Justify your answer.
(d) State whether the following requirements of a mobile phone are functional or non-functional. Justify your answers.
(i) A user shall be able to make a call using the mobile phone.
(ii) It shall not harm the user by emitting radiations.

Bandaranayake College- Gampaha
Information and Technology – Competency 7
(Past papers 2011 - 2020)
No - 06

2013 A/L

6. A delivery service company established in Sri Lanka receives over 1 million parcels per day for distribution. In order to send them to different parts of Sri Lanka, these parcels should be sorted and put into appropriate delivery vans. At present, 5 people at the sorting department do this process manually. This process has a drawback of putting parcels into wrong delivery van. Taking at least 3 days to distribute parcels received within a day is also a weakness in this process. Therefore, the general manager has decided to automate the sorting process by using a bar code system. The bar code pasted on parcel consists of the receiver's postal code. The proposed computer based system will read these bar codes, sort the parcels automatically and put them into the correct delivery van through a conveyor belt without human intervention. The general manager strongly believes that computerization will help them to overcome the current problems in the sorting process.
- (a) Identify **two** functional requirements of the proposed computer based system. Justify your answer.
 - (b) State **two** non functional requirements of the system with justifications.
 - (c) Discuss, giving **two** reasons, whether the general manager's decision to computerize the sorting process is correct or not.

2014 A/L

6. A university in Sri Lanka has around 8000 students. It has only one library. Currently, three library assistants provide all the library services such as lending, returns and answering the queries from the students. It is observed that about 90% of the students use the library facilities from 7:00 a.m. to 9:00 a.m., 12 noon to 1:00 p.m. and 6:00 p.m. to 7:00 p.m. Long queues of students can be seen in front of the three counters manned by the three library assistants during those hours. This situation has led to students' unrest since they have to waste their time in long queues. Library assistants are also not happy due to heavy work load and sometimes this has lead them to make mistakes.
- (a) Identify and state **three** functional requirements associated with the above university library system.
 - (b) Identify and state **two** non-functional requirements related to the above system with justifications.
 - (c) Propose **two** different computerized solutions and **one** non computer-based solution to solve the problems in the university library system.

Bandaranayake College- Gampaha
Information and Technology – Competency 7
(Past papers 2011 - 2020)
No - 06

2015 A/L

6. Draw a context diagram to show the overview of the library system described below. Clearly indicate external entities and data flows of your diagram and state any acceptable assumptions that you have made.

The National Information Technology Library (NITL) provides e-books to its users through an online system named "Library Information Processing System (LIPS)".

A person should submit an application to NITL to become a member of the LIPS. The NITL evaluates the application and enters it to the LIPS, if it is approved. After entering the application data, LIPS issues an activation code to NITL which in turn passes it to the relevant person. Once the activation code is received the person becomes a member of LIPS. A member can obtain his/her username and password by providing the activation code to the LIPS. A member can subsequently access e-books by entering his/her username and the password to the LIPS.

2016 A/L

- 3.(c) Assuming that the human brain is a system, compare and contrast a human brain and a computer based information system.

6. Draw a context diagram to show the operations of the online assignment management system described below adhering to the standards of the Structured System Analysis and Design Methodology (SSADM). Clearly indicate external entities and data flows of your diagram. State any assumptions that you have made.

The National University of ICT (NUICT) conducts distance learning programs. The students of NUICT are continuously assessed through online assignments. The students of NUICT use an online assignment management system called NetAssign to download assignments and upload answer scripts. The examiners use NetAssign to upload assignments and to download answer scripts. Once the answer scripts are marked, the examiners enter marks into NetAssign. The students can view only the grades determined by NetAssign. To use NetAssign, both examiners and students must provide authentication details to the system. These authentication details are provided by NUICT to its students and examiners.

Bandaranayake College- Gampaha
Information and Technology – Competency 7
(Past papers 2011 - 2020)
No - 06

2017 A/L

Bandaranayake College- Gampaha
Information and Technology – Competency 7
(Past papers 2011 - 2020)
No - 06

1. Fill in the blanks in the following Data Flow Diagram (Figure 1.1) of the sales information system of a company called Bookland, only by using the words in **Boldface** in the description given below.

Bookland is a book store that specializes in selling rare books, which are usually not available from other sources. As a practice, Bookland maintains just a one copy of any book at a time due to the higher price of rare books.

Typically, a customer makes a **book enquiry** over the phone from the **Sales Assistant** at Bookland. She then goes through **book details** in the **Inventory** file to check whether such a book is in their stock. If the details of the book is found in the Inventory file, the Sales Assistant then refers to the **Hold-on Requests** tray to make sure that the **book status** is 'available' and makes a **reply to the enquiry**. If the book status is 'available' and the **customer** wishes to reserve the book, she then takes customer's **personal details** and places a **hold-on request** against that book in the Hold-on Requests tray making the book no longer available.

When the customer comes to make the payment and collect the book, the **Cashier** at Bookland refers to the Hold-on Requests tray and finds the relevant hold-on request made by the customer. If there is a valid hold-on request, she then accepts the **payment** from the customer, issues a **payment receipt** to the customer and finalizes the sale. The customer is then allowed to take away the book. The Cashier also files the **copy of the payment receipt** in the Sales file, uses it at the end of the day to compile a **sales report** and sends it to the **Owner** of the Bookland. After every sale, the Cashier updates the book details in the Inventory file and keeps the stock up to date. When the Owner supplies books to Bookland, he sends **details of books** to Cashier and the Cashier adds them one by one to the Inventory file.

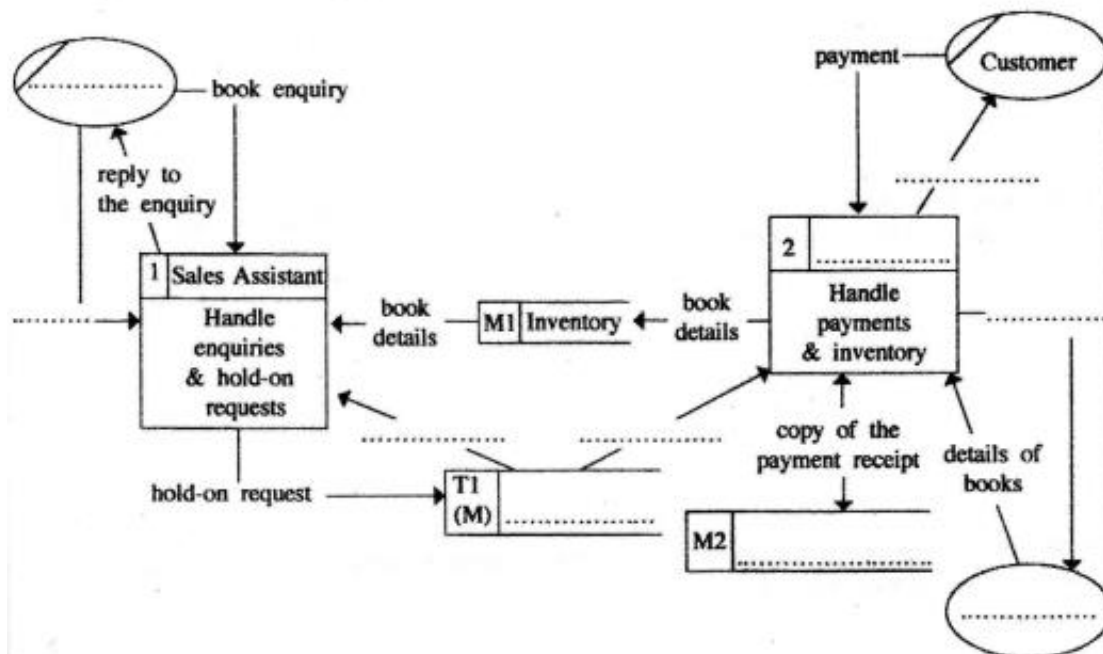
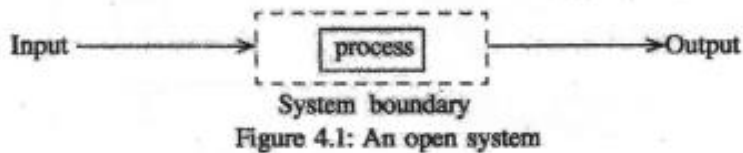


Figure 1.1: Level 1 Data Flow Diagram of Sales Information System of Bookland

Bandaranayake College- Gampaha
Information and Technology – Competency 7
(Past papers 2011 - 2020)
No - 06

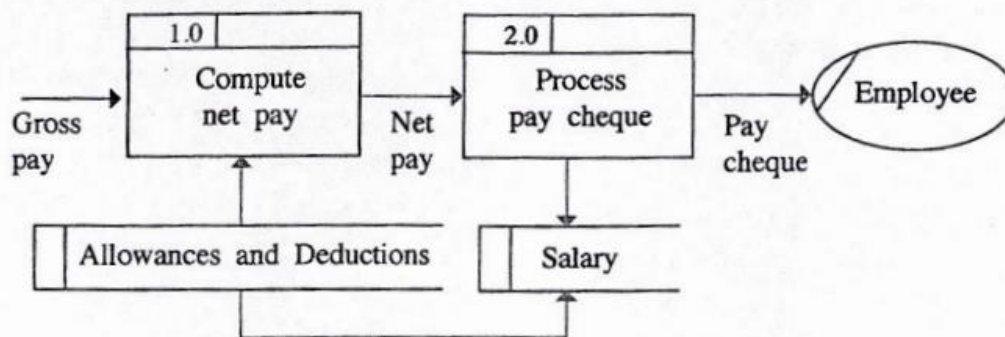
4. (a) (i) The Figure 4.1 represents an open system. Using the basic components: input, process, output and system boundary as given in the figure, draw a diagram to represent a closed system.



- (ii) Explain the reason for drawing the diagram which you drew for (i) above.

2018 A/L

- (b) (i) Identify and explain the fundamental error in the following Data Flow Diagram (DFD).



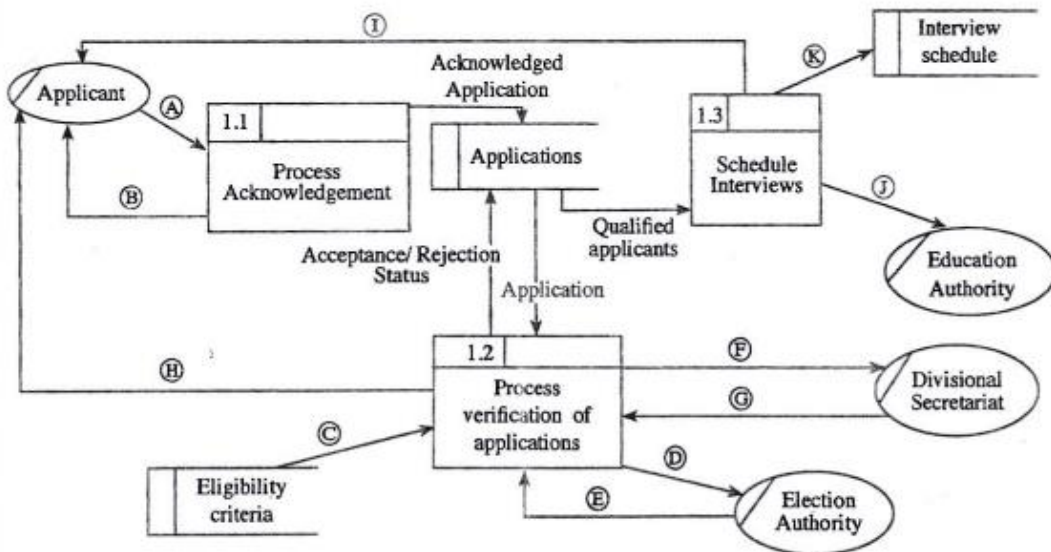
Bandaranayake College- Gampaha
Information and Technology – Competency 7
(Past papers 2011 - 2020)
No - 06

6. (a) The school admission process of a certain country is explained using the description and the data flow diagram given below.

The applicant sends the application to the respective school. The school sends an acknowledgement to the applicant. The school then verifies the information in the application by checking the following.

- Eligibility of applicant : by using the eligibility criteria taken from the data store 'Eligibility Criteria'
- Registration in the electorate : by requesting the electoral list from the Election Authority (Election Authority sends the Electoral list to the school)
- Residential status : by requesting the confirmation of residence from the Divisional Secretariat (Divisional Secretariat sends the confirmation of residence to the school)

After verification of information, the applicant is informed whether the application has been accepted or rejected which is noted in the application and stored in the data store "Applications". The school obtains the valid applications from the data store "Applications" and schedules the qualified applicants for interviews. Then it calls the applicants for interviews and sends the interview schedule to the Education Authority. The interview schedule is stored in the data store "Interview Schedule".



Level 1 DFD

The Level 1 Data Flow Diagram for the above scenario with some data flows labelled as A - K is given in figure. Identify and write down the relevant data flows against the labels A - K.

Bandaranayake College- Gampaha
Information and Technology – Competency 7
(Past papers 2011 - 2020)
No - 06

- (b) (i) Briefly explain the key difference between functional and non-functional requirements as used in the system development life cycle.
- (ii) The following list includes some functional and non-functional requirements of a proposed e-commerce web portal that plans to sell products on a catalogue:
- A – Enable user to find products based on a variety of item characteristics
 - B – The system should work on any web browser
 - C – The system should be easy to use
 - D – Enable user to submit his/her comments on products and read other users' comments on items
 - E – Data in the system should be preserved even in the case of a system failure
 - F – Enable user to create and maintain a wish list of desired products
 - G – Enable user to browse through products on catalogue
 - H – The system should be available for use 24 hours a day, 7 days a week and 365 days an year
 - I – The system should authenticate users through usernames and passwords
 - J – The system should have versions customized for global users, e.g., French, Japanese, German, etc.

Identify and write down the labels of the **non-functional** requirements in Ⓐ - Ⓙ.

Bandaranayake College- Gampaha
Information and Technology – Competency 7
(Past papers 2011 - 2020)
No - 06

2019 A/L

6. (a) A blood testing centre has the following activities:

The patient hands over the test request slip to the receiving counter. Receiving counter issues an invoice to the patient and sends a copy to the cashier. The patient checks the invoice, approves it and hands it over to the cashier with the payment. Cashier issues a receipt to the patient and also sends a copy of the receipt to the laboratory. Patient hands over the receipt to the laboratory. The laboratory verifies the patient and conducts the blood test and returns the updated receipt marked as 'done' to the patient. The laboratory sends the report to the receiving counter. Later, the patient hands over the updated receipt to the receiving counter and the receiving counter hands over the report to the patient with the re-updated receipt marked as 'issued'.

(i) The context diagram for the above activities, with missing data flows \textcircled{P} , \textcircled{Q} , \textcircled{R} , \textcircled{S} and \textcircled{T} , is given in Figure 1 below.

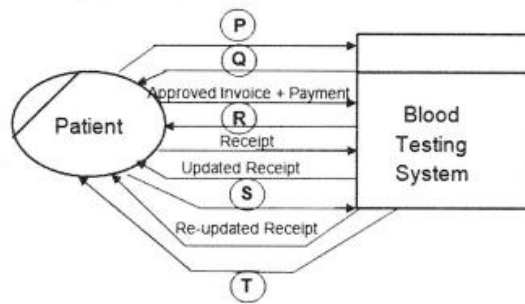


Figure 1

Identify the **five** missing data flows from the description given above and write them down.

(ii) Level 1 of the DFD for the above context diagram is shown in Figure 2.

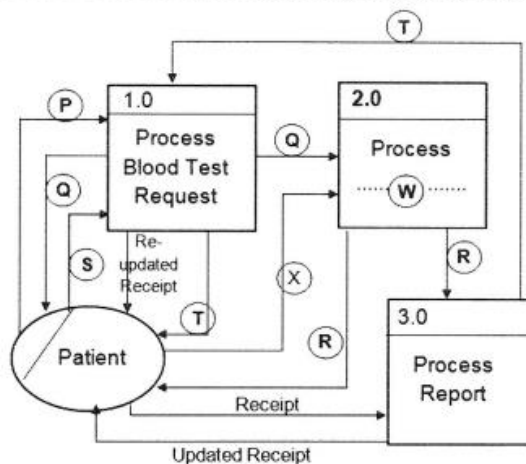


Figure 2

(A) Write a suitable term to replace the label \textcircled{W} in Process 2.0.

(B) Identify and write down the missing data flow labelled \textcircled{X} .

Bandaranayake College- Gampaha
Information and Technology – Competency 7
(Past papers 2011 - 2020)
No - 06

- (b) (i) What is *requirement analysis*?
- (ii) List **two** advantages of requirement analysis.
- (iii) Give **one** method that can be used to verify whether a functional requirement is satisfied in a system.
- (iv) The following list consists of some *functional*, *non-functional* and other requirements of a proposed school library management system where users can borrow and return books in addition to other usual tasks.
- (A) The system should authenticate users through username and password.
- (B) The system should enable users to search for books based on the *title, type, ISBN No. or publisher name*.
- (C) The total cost for the library system should be less than Rs. 500 000.00.
- (D) The system should be available 99% of the total time.
- (E) The system development should be completed within 9 months.
- (F) Book lending details should be preserved even if the system crashes during operation.
- (G) The book database of the school library management system must be secured by preventing unauthorized access.
- (H) Since the Past Pupils Association has indicated its willingness to develop the system, preference will be given to them.
- From A to H, identify and write down the labels of **two functional** requirements and **two non-functional** requirements respectively.

Bandaranayake College- Gampaha
Information and Technology – Competency 7
(Past papers 2011 - 2020)
No - 06

2020 A/L

10. (a) The 3-stage procedure for handing over a letter for registered post to a post office is as follows:

- **Determining Postage**
The customer hands over the letter to the **Registration Counter**. The letter is weighed and the postage for the relevant weight is read from a table. The postage is written on the letter by the counter and it is given to the customer.
- **Issuing Stamps**
The customer hands over the letter with the postage written on it to the **Stamps Counter** with the amount of postage. Stamps for the postage and the letter are issued to the customer with any balance due by the **Stamps Counter**.
- **Registering Letter**
The customer sticks the stamps on the letter and hands it over to the **Registration Counter**. The **Registration Counter** accepts the letter, sticks the 'Registered Post' label with a unique identification code to the letter, keeps the letter and issues a receipt with sender and recipient information with the date and the amount paid, to the customer.

Using standard symbols, draw the following:

- (i) Context Diagram
 - (ii) Level 1 Data Flow Diagram (DFD)
- (b) Your school plans to use an online system to provide extended learner support to A/L and O/L students during school holidays, weekends and other times that the school is not open. It is decided to use a suitable Commercial-Off-The-Shelf (COTS) software system for this need. Your team has been requested to help with this project.
- (i) Some of your project team members argue that since COTS software are to be used there is no need of requirement analysis. List **three** most significant reasons to explain why you must complete requirement analysis even in this project. **Note:** Your answer must be specific to a project with COTS software use. Generic answers will not be accepted.
 - (ii) Following are part of the requirements identified for the above project. Identify and write down the labels (A–G) of all the *functional requirement* statements within the list.
 - (A) Teaching material and learning content upload to the system shall only be allowed to the teachers assigned to that particular learning session.
 - (B) The system shall be available for user access at least 99.9% of the time.
 - (C) The access history for each student's learning activity participation or content use within a course must be maintained as a report to be accessed by the subject teacher.
 - (D) The system should be easy to work with after 1 hour of training.
 - (E) At the end of each learning session, the students must be provided with an option to ask questions from the teacher.
 - (F) The system should respond to any user request within 2000ms.
 - (G) The system should be able to serve a minimum of 200 concurrent users at a given time.
 - (iii) What is the most appropriate testing strategy for your team to evaluate the selected COTS software system for the identified requirements?