



education

Department:
Education

PROVINCE OF KWAZULU-NATAL

GREENBURY SECONDARY SCHOOL

INFORMATION TECHNOLOGY

THIRD QUARTERLY TEST

GRADE 11

28 SEPTEMBER 2016

MARKS: 60

EXAMINER :M PADAYACHEE

TIME: 1 ½ Hours

MODERATOR :S NAIDOO

INSTRUCTIONS AND INFORMATION

1. This question paper consists of **FOUR** questions and **7** pages including this cover page.
2. Answer **ALL** the questions.
3. Read **ALL** the questions carefully.
4. Start **EACH** question on a **NEW** page.
5. Leave a line after each answer.
6. The mark allocation generally gives an indication of the number of facts required in your answer.
7. Number the answers correctly according to the numbering system used in this question paper.
8. Write neatly and legibly.

QUESTION ONE [MATCHING]

Match the description provided in column A with the term from column B that best suits the description given. Write only the letter of the term next to the question number of the description.

COLUMN A	COLUMN B
1.1. Connects devices in a small area using Infra-Red, Bluetooth and WiFi.	A EMI
1.2. Signals travelling along wires may be intercepted by outsiders.	B Backbone
1.3. A device used to join two cables. It may also amplify or boost the signal.	C WLAN
1.4. When several LAN segments hang of one fibre optic cable it is called...	D Wiki
1.5. The layout of computers in a network is called a	E Proxy Server
1.6. Set of rules that governs the way information travels from one point to the next in a network e.g. Internet.	F RSS Feed
1.7. A unique website where users may contribute or edit articles.	G Content Aggregator
1.8. Signals from machinery may corrupt signals travelling in wires.	H WPAN
1.9. A website or software that collects specific information from other websites.	I Eavesdropping
1.10. A server maintained by an ISP or business through which all web content passes.	J Weblog
	K Router
	L Web Server
	M Repeater
	N Protocol
[10]	O Topology

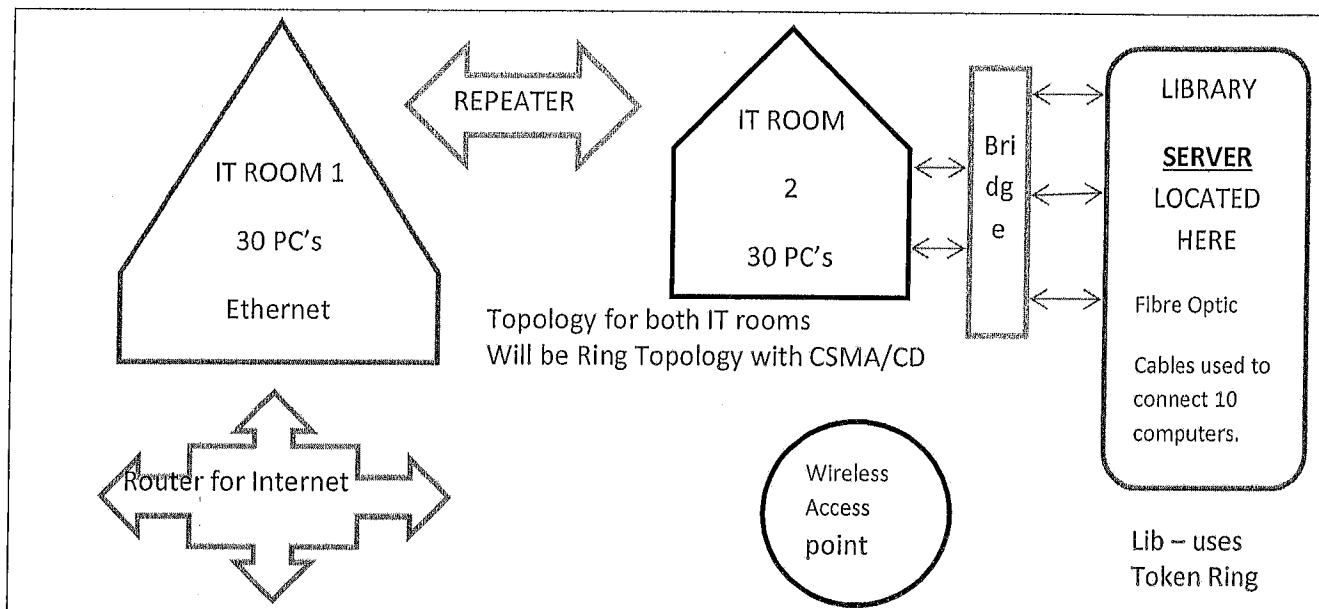
SCENARIO

Your school is deciding to upgrade its current setup of computers to keep up with modern trends. At present the school has only 3 office computers for Administration work, and 30 computers each in the IT rooms.

They have also decided that the entire school should be connected to the internet by making it a HOT SPOT.

The school governing body approached a company to provide a quotation showing possible costing.

Study the diagram of the Company's recommendations and help the school to streamline the features so that they purchase the best setup at the most reasonable price.



QUESTION TWO [NETWORK AND COMMUNICATIONS TECHNOLOGIES]

Due to the high cost of upgrading for the future, the Principal and the governing body have many questions. Your knowledge of computers is required to assist them to make a final decision.

- 2.1. Coaxial and STP cables used in the IT rooms pose three major problems due to the copper that is used in the cabling. Name and briefly describe each problem. (6)
- 2.2. Explain why the cabling in the library is not the best chosen. Give 2 reasons. (2)
- 2.3. Give two disadvantages of using the topology suggested for the IT rooms. (2)
- 2.4. Explain the purpose of using a switch in the IT rooms. (2)
- 2.5. Discuss the difference between a Repeater and a Bridge. (2)
- 2.6. Why is it necessary to have a router present on the premises? (2)
- 2.7. Do you think that the LAN technologies chosen for the IT rooms is appropriate for the suggested topologies included. Motivate why you think so. (2)
- 2.8. Describe how the two media access methods, mentioned in the quotation, works. (4)
- 2.9. What does it mean to say that the school is a HOT SPOT? (1)
- 2.10. Learners in the school will be allowed to use their tablets or smartphones to access the Internet, with obvious restrictions. Discuss the different technologies that may be used by the different devices under the following headings:

- a) EDGE (1)
- b) 4G LTE (1)
- c) WiMax (1)

[26]

QUESTION THREE [INTEGRATED SCENARIO]

The principal of your school is not very keen on the whole school being on the internet. Answer the questions below based on some of his fears.

3.1. Give two dangers of social networking in school. (2)

3.2. During transfer of files between learners and downloading from the internet, one has to be very careful of the content received and sent. List two security measures that one can employ to keep their computer protected from unwanted content. (2)

3.3. Define the terms related to Internet usage:

3.3.1. Spam (1)

3.3.2. Adware (1)

3.3.3. Bandwidth (1)

3.4. What do the following acronyms stand for:

3.4.1. HTTP (2)

3.4.3. TCP/IP (2)

[11]

QUESTION FOUR [PROGRAMMING AND ALGORITHM DESIGN]

The school requires software to manage the different departments of the school. You, as an IT learner, are required to assist in developing software to run the school.

4.1. The Sports department wants your assistance to develop an algorithm that uses the full name (Surname Firstname/s) of a participating athlete, to generate a Registration Number.

This number is used to identify the athlete by making tags with the number printed on it. This registration number contains alphanumeric characters. Your task is to examine the already written code and give input by answering the questions:

```

1. procedure TForm1.Button1Click(Sender: TObject);
2. Var fName, cde : String;
3. len , mid , f ,s : Integer;
4. begin
5. fName := InputBox('Enter Name','Surname then firstname','');
6. len := Length(fName);
7. mid := len div 2;
8. if odd(len) then
9.   begin
10.    mid := mid + 1;
11.    cde := copy(fName,1,1) + copy(fName,mid,1) + copy(fName,len-2);
12.  end
13. else
14.  cde := copy(fName,mid,1) + copy(fName,mid+1,1) + copy(fName,len-1);
15.  f := len div 10;
16.  s := len mod 10;
17.  cde := IntToStr(f) + cde + IntToStr(s);
18. RichEdit1.Lines.Add(cde);
19. end;

```

4.1.1. Trace the code to determine the registration number formed when the input is:
(N.B. *No trace table is required as marks will only be awarded for output*)

- | | |
|---------------------|-----|
| a) Jonathan Francis | (2) |
| b) Hlakanipho Duma | (2) |
| c) Tony Cho | (2) |

4.1.2. Describe in not more than SEVEN steps exactly what is being done with the input to obtain the desired registration code. (7)

4.1.3. You need to modify the program so that it removes spaces found in the reg no. formed. Write the Delphi statements to solve this problem. At which line would you insert the new statements. (6)

- 4.2. The Library needs to create a database in order to store the details of all members. Software developers have agreed on the details necessary to construct the respective record. Your task is to continue with the completion of the a software as specified by the questions that may follow:

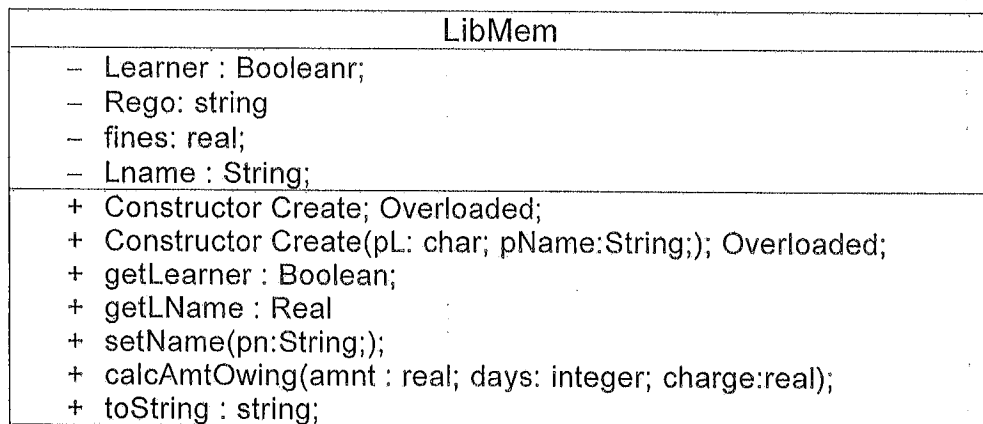
THE RECORD STRUCTURE

Here is a list of fields that constitutes the record. The record represents the details of all library members.

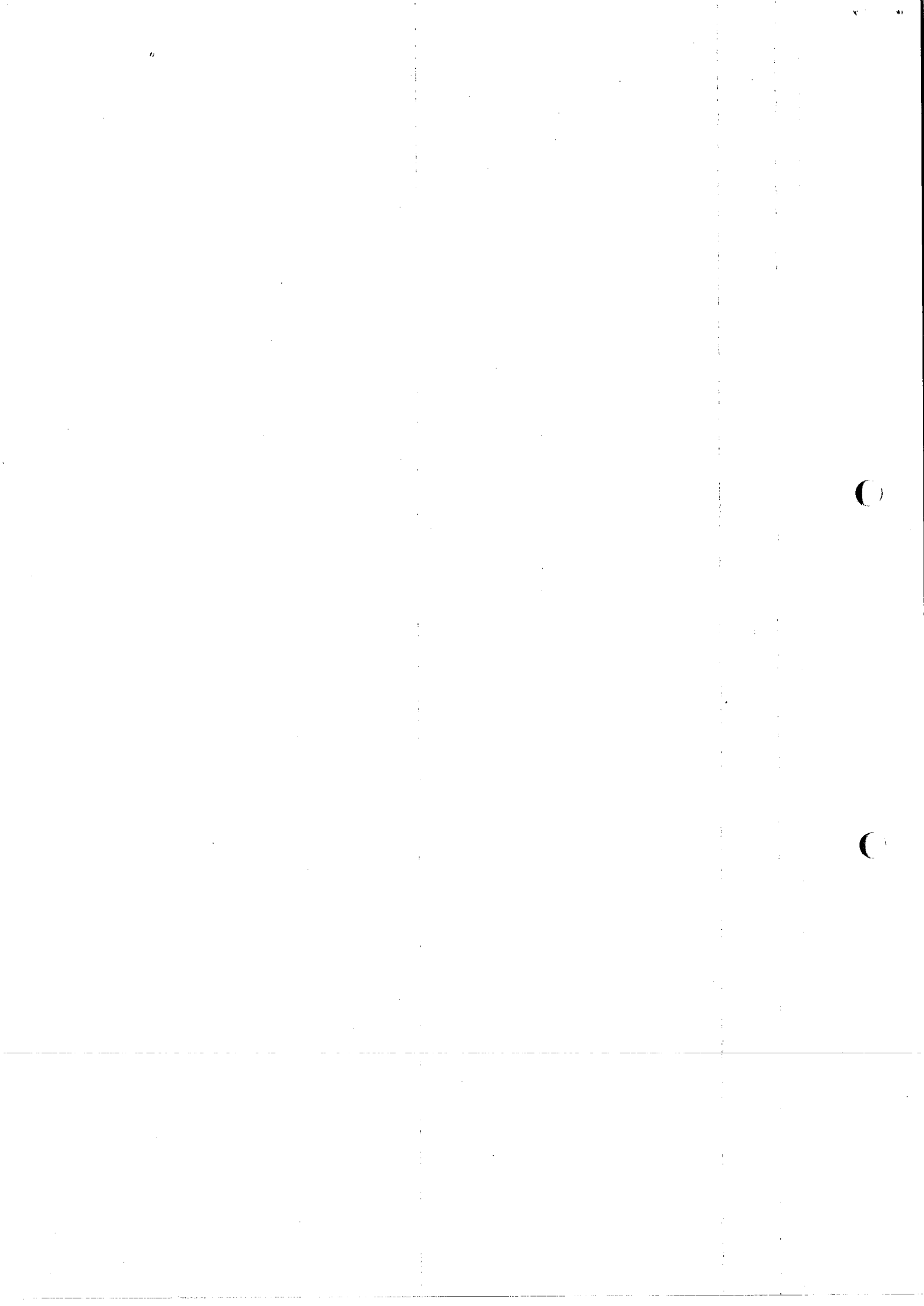
1. A Boolean variable (**Learner**) to represent whether a member is a learner or not. If not a learner, the member could be an educator or any other staff member in the school.
2. A string variable called **RegNo** that will store a code generated by the members full name.
3. A real variable called **finer**, that stores the total fines, if any, owed by the member.
4. A String variable, **fName**, that stores the full name of the member.

- 4.2.1. Declare the object type for the class variables above. To do this you must only write the segment of the code that defines the instance variables. The name of the object type is **LibMem**. (3)
- 4.3. Study the class diagram which represents the object class for the record structure above and answer the questions based on it.

CLASS DIAGRAM



- 4.3.1. Clearly distinguish between a class and an object. (2)
- 4.3.2. The class diagram has various methods. Identify the three different types of methods from the class and give an example of each from the diagram. (6)
- 4.3.3. From the class diagram identify the following:
- a) The parametrised constructor. (1)
 - b) A Mutator method (1)
 - c) An Accessor method (1)



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2.8. **CSMA/CD** – Used in a star or bus network. If a node wants to transmit data, it must listen to see if the medium is clear. All nodes have equal access so once a node gets a clear line, it may transmit. If two nodes send at the same time a collision will occur hence they will stop sending.

Token ring/Token passing – in this method, a small program called a token travels around the ring. If the token is marked as free, the device takes the token adds data, sender and receiver addresses are added to the token and marks the token as busy.

2.10. a) **Enhanced Data rates for GSM Evolution** – is a digital mobile phone technology that allows improved data transmission rates as a backward-compatible extension of GSM. EDGE is considered a pre-3G radio technology. Also known as Enhanced GPRS.

b) **4G** is the fourth generation of mobile phone communications standard that follows 3G. It provides users with ultra broad-band internet access. This high speed bandwidth makes IP telephony, gaming services, high definition mobile TV, video conferencing and 3D television possible from mobile devices.

c) **WiMAX** – is a wireless communications standard which can commonly provide from fast data transfer rates.

It covers a wider area than WiFi and provides mobile broadband connectivity, wireless alternative to cable broadbanding, VoIP and IPTV.

QUESTION THREE

3.1. – people will tend to spend more time on it and neglect their duties and important work.
- People may use it to promote hate speech or intimidate others.

3.2. Antivirus , Antispam , Anti spyware etc

3.3.1. Unsolicited junk email

3.3.2. Software that is lodged in an undetectable area of a network or PC, that is able to record events and details of users' and send back to the sender of the file.

3.3.3. Adware is advertising software

3.3.4. Bandwidth refers to the total data handling capacity of a communication channel.

3.4.1. Hypertext transfer protocol

3.4.2. File transfer protocol

3.4.3. Transfer control protocol

QUESTION ONE

- 1.1. H
- 1.2. I
- 1.3. M
- 1.4. B
- 1.5. O
- 1.6. N
- 1.7. D
- 1.8. A
- 1.9. G
- 1.10. E

QUESTION TWO

2.1. **EMI** – Signal from other sources such as machinery can corrupt signals travelling in copper cables.

Attenuation – the signal loses strength over a distance.

Eavesdropping – signal travelling along copper cables can be intercepted by outsiders.

Crosstalk – Signals in adjacent wires can interfere with each other as in crossed telephone conversation.

2.2. – small area does not have so expensive cabling
- the school does not have the expertise to install and maintain

2.3. –very orderly network where every device has an opportunity to transmit.
- each node regenerates the data signal so that signal loss stays at a minimum.
- can easily extend network due to the signal strengthening.

2.4. Firstly a switch connects devices in a network. The switch also boosts signals coming into them.

2.5. **Repeater** is simply a device that connects network segments over long distances because signals weaken over long distances.

A **bridge** connects LAN segments, strengthens signals and selects the path to send packets of data by examining the MAC address.

2.6. A router is able to all that a bridge and repeater does as well as use an IP address thus making internet connectivity possible from one LAN to the next.

2.7. No. Ethernet technology is most commonly used with star topology.

QUESTION FOUR

- 4.1.1. a) 1n1s6
 b) 1Hpmas
 c) 0yho8

- 4.1.2. Step 1 – the length of the full is found and checked if it is odd or even.
 Step 2 – if odd, then the first letter, middle letter and the last 3 letters are joined
 Step 3 – if even, the 2 middle chars and the last 2 letters are joined
 Step 4 – then the digits of the length of the string is separated
 Step 5 – the first digit is joined to the front of the code and second digit is joined to the

```
4.1.3. ...newCde := "",
for i = 1 to length(cde) do
  Begin
    If not (cde[i] = ' ') then newCde := newCde + cde[i]
  End;
Cde := newCde;
```

```
4.2.1. Type LibMem = Class(TObject)

  Private
    Learner : Boolean;
    RegNo : String;
    Fines : real;
    fName : String;
  Public
    End;
```

4.3.1. A class is subprogram that contains methods objects and variables. It contains attributes that pertain to a particular object.
 An object is an instance of a class. It inherits class attributes and member variables.

```
4.3.2. Constructor : Constructor Create; Overloaded;
      Constructor Create(pl: char; pName:String); Overloaded;

  Accessor : getLearner , getLName
  Mutator - setName
  Auxiliary methods : calcAmtOwing , toString
```

```
4.3.3. a) Constructor Create(pl: char; pName:String); Overloaded;
      b) setName
      c) getLearner , GetLName
```

4.4. Accessors – gets values out of the class.
 Mutators – sets the values of the class attributes or changes the class variables.

4.5. Procedures does not return any values back to the calling statement.
 Functions are of a specific type and they return values back to the calling statements.

4.6. toString and calcAmtOwing

4.7. calcAmtOwing(Var amt : real; days: integer; charge:real);

4.7.1. A reference parameter or a variable parameter

4.7.2. a) Actual Parameters or arguments
 b) Formal Parameters.