CMR
INSTITUTE OF
TECHNOLOGY

USN | | | | | | | | | | |

Improvement Test

Sub:	COMPUTER NETWORKS-1							Code:	10CS55
Date:	18 / 11 / 2016	Duration:	90 mins	Max Marks:	50	Sem:	V	Branch:	ISE

Answer Any FIVE FULL Questions

		Marks	OBE	
			CO	RBT
1(a)	Explain the structure of encoder and decoder for Hamming code with example.	[10]	CO3	L4
2(a)	Explain IPV6 header format with its extension headers.	[10]	CO6	L4
3(a)	Explain Classfull and Classless addressing with respect to IPV4.	[4]	CO6	L4
(b)	Difference between IPV4 and IPV6 header.	[6]	CO6	L2
4(a)	What is internet Checksum? With an example, list the steps undertaken by sender and receiver for error detection.	[10]	CO3	L1
5(a)	Explain in detail about IPV4 header format.	[10]	CO6	L4
6(a)	Explain error detection and error correction with respect to block coding	[10]	CO3	L4
7(a)	Find the codeword and detect the error, using CRC given dataword “1010” and generator “ 1001”.	[10]	CO3	L1

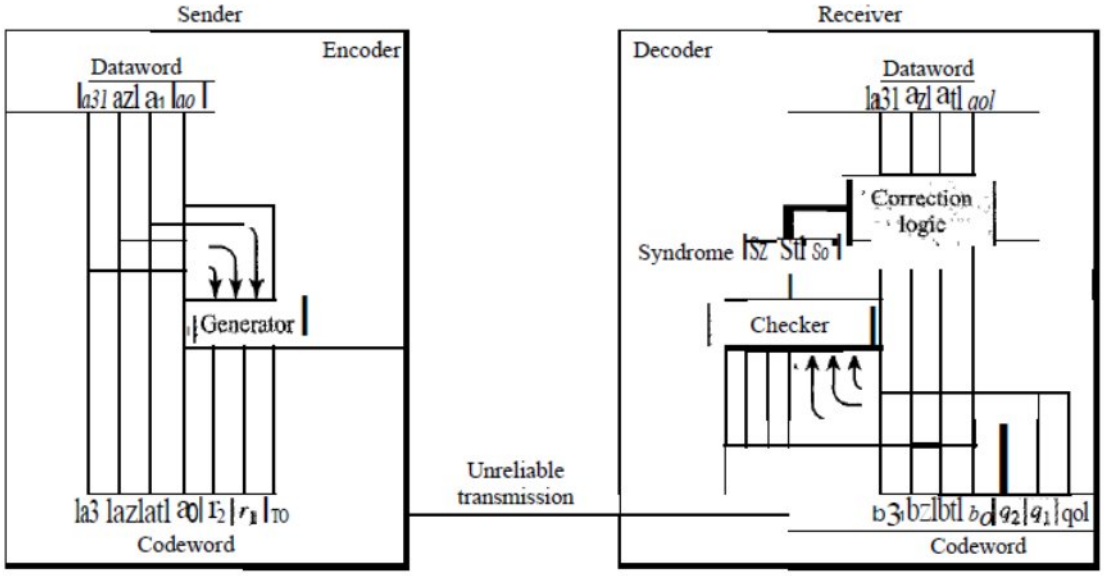
Course Outcomes		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1:	Relate the functions of OSI reference model with the funtions of internet model.	1	-	-	-	-	-	-	-	-	-	-	-
CO2:	Define types of data signals, their properties and the and the methods of signal transmission	1	2	-	-	-	-	-	-	-	-	-	-
CO3:	Construct efficient codes for data on impaired communication channels.	1	2	3	-	-	-	-	-	-	-	-	-
CO4:	Describe different link control techniques for noisy and noisefree channels.	1	2	-	-	-	-	-	-	-	-	-	-
CO5:	Describe Channel Access strategies using ALOHA and CSMA based channel accessprotocols.	-	2	-	-	-	-	-	-	-	-	-	-
CO6:	Simulate the working of network and analyse the performance based on different parameters like data rate, conjestion, packet drop, throughput etc..	-	-	-	4	5	-	-	-	-	-	-	-

Cognitive level	KEYWORDS
L1	List, define, tell, describe, identify, show, label, collect, examine, tabulate, quote, name, who, when, where, etc.
L2	summarize, describe, interpret, contrast, predict, associate, distinguish, estimate, differentiate, discuss, extend
L3	Apply, demonstrate, calculate, complete, illustrate, show, solve, examine, modify, relate, change, classify, experiment, discover.
L4	Analyze, separate, order, explain, connect, classify, arrange, divide, compare, select, explain, infer.
L5	Assess, decide, rank, grade, test, measure, recommend, convince, select, judge, explain, discriminate, support, conclude, compare, summarize.

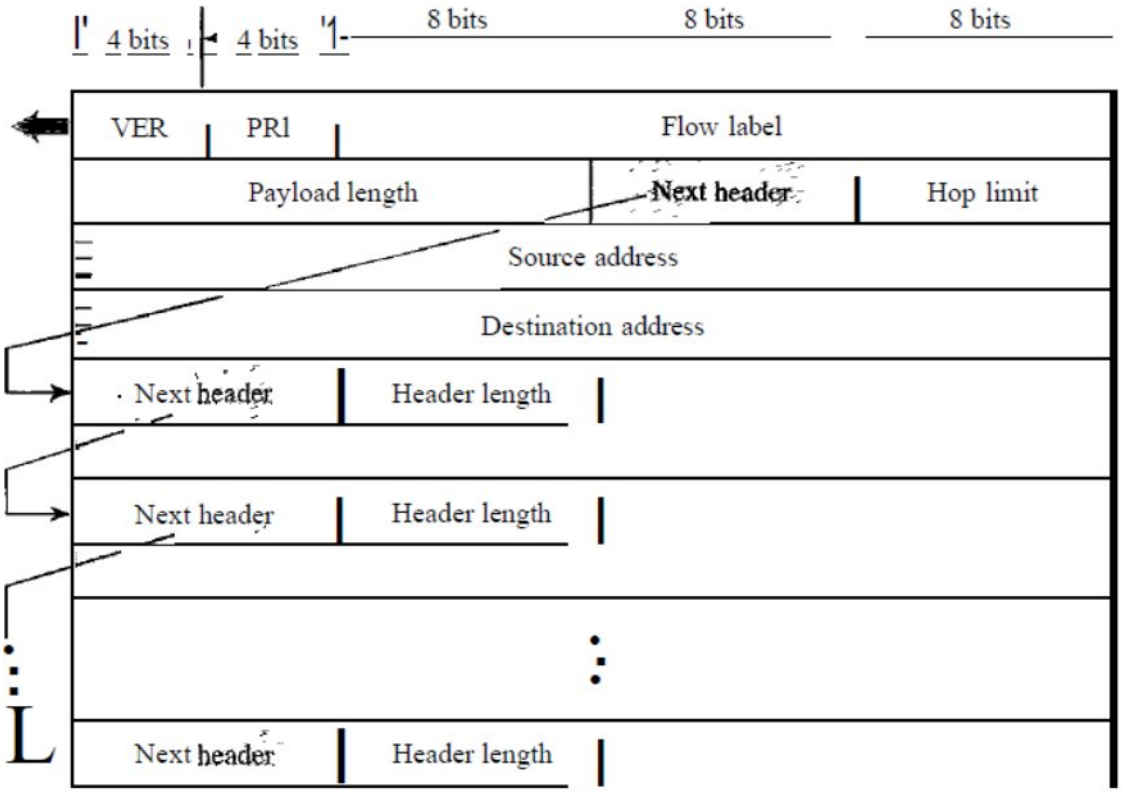
PO1 - *Engineering knowledge*; PO2 - *Problem analysis*; PO3 - *Design/development of solutions*; PO4 - *Conduct investigations of complex problems*; PO5 - *Modern tool usage*; PO6 - *The Engineer and society*; PO7- *Environment and sustainability*; PO8 – *Ethics*; PO9 - *Individual and team work*; PO10 - *Communication*; PO11 - *Project management and finance*; PO12 - *Life-long learning*

Improvement test

1.



2.



Flow label. The flow label is a 3-byte (24-bit) field that is designed to provide special handling for a particular flow of data.

Payload length. The 2-byte payload length field defines the length of the IP datagram excluding the base header
Next header. The next header is an 8-bit field defining the header that follows the base header in the datagram. The next header is either one of the optional extension headers used by IP or the header of an encapsulated packet such as UDP or TCP.
Hop limit. This 8-bit hop limit field serves the same purpose as the TIL field in IPv4.
Source address. The source address field is a 16-byte (128-bit) Internet address that identifies the original source of the datagram

3.

IPv4 was currently used in the TCP/IP protocol suite and provides the host-to-host communication between system in the internet. Even though IPv4 was well-designed. It has some deficiencies which make it unsuitable for the fast growing internet.

The deficiencies of IPv4 are

- Address depletion still persists and continues
- Lack of design of minimum delay strategies and reservation of resources not done to accomodate real time application in IPv4.
- Lack of security aspects in IPv4. No encryption or authentication of data is provided.

To overcome the deficiencies of IPv4, IPv6 (internet working Protocol version 6) was developed by IETE (Internet Engineering Task Force) IPv6 was developed to deal with the long anticipated problem of IPv4 running out of address.

IPv4 was modified to accommodate the unpredicted growth of the internet.

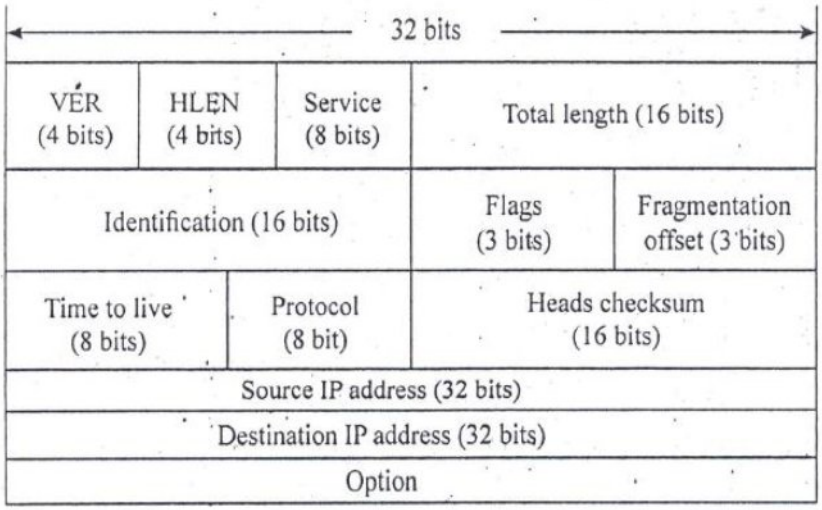
Advantages of IPv6 over IPv4

- IPv6 address is 128 bits and these is a huge or large address space available.
- IPv6 uses new header format with flexible options facility. This helps in routing process because most of the options do not need to checked by routers.
- IPv6 has new option facility to allow functionalities to be added.
- IPv6 is designed to allow the extension of the protocol when it is needed by new technologies or applications.

4. Internet Checksum
Traditionally, the Internet has been using a 16-bit checksum. The sender calculates the checksum by following these steps.
Sender site:
1. The message is divide into 16 bit words
2. The value of the checksum word is set to 0.
3. All words including the checksum are added ushtg one's complement addition.
4. The sum is complemented and becomes the checksum.
5. The checksum is sent with the data.
Receiver site:
1. The message (including checksum) is divided into 16-bit words.
2. All words are added using one's complement addition.
3. The sum is complemented and becomes the new checksum.
4. If the value of checksum is 0, the message is accepted; otherwise, it is rejected.
The nature of the checksum (treating words as numbers and adding and complementing them) is well-suited for software implementation. Short programs can be written to calculate

the checksum at the receiver site or to check the validity of the message at the receiver site.

5.



Packets in the IPv4 layer are called datagrams and the format of IPv4 datagram is shown in figure above. The datagram has two parts;heads and data.

Version: The first 4-bit heads field and defines the version of the IPV4 protocol. The current version is 4 and field has the value 4.

Header length (HLEN): This 4 bit field defines the total length of the datagram header in 4 byte words or 32 bit words.

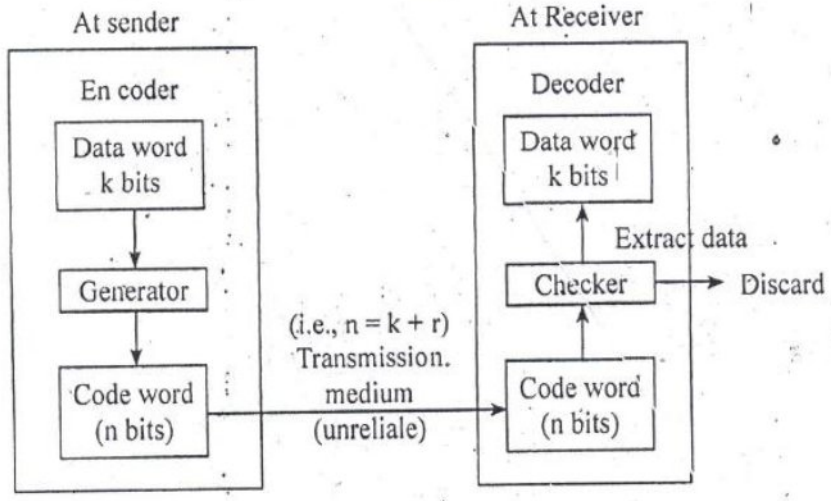
Service: The first are called as precedence bits and next 4 bits are called type of service bits and last bit is not used.

Total length: This 16 bit field defines the entire IPv4 packet size including header and data, in bytes.

6. Error detection

1. Receiver should have list of valid codewords
2. Original codeword has changed to an invalid one

The figure below depicts the role of block coding in error detection.



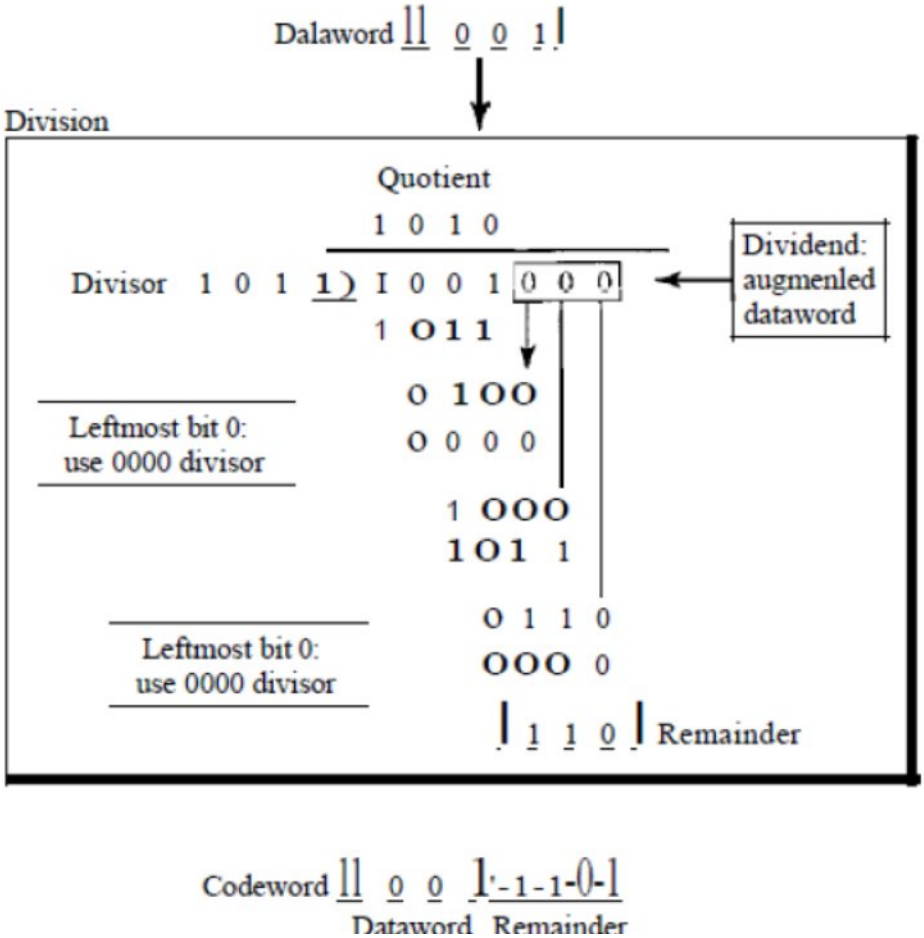
Error detection in Block coding

At sender

i) Sender creates a codeword out of dataword and extra bits using generator. Generator applies the rules are procedure of encoding.

ii) Code word is transmitted on the unreliable transmission medium on transmission medium, there are

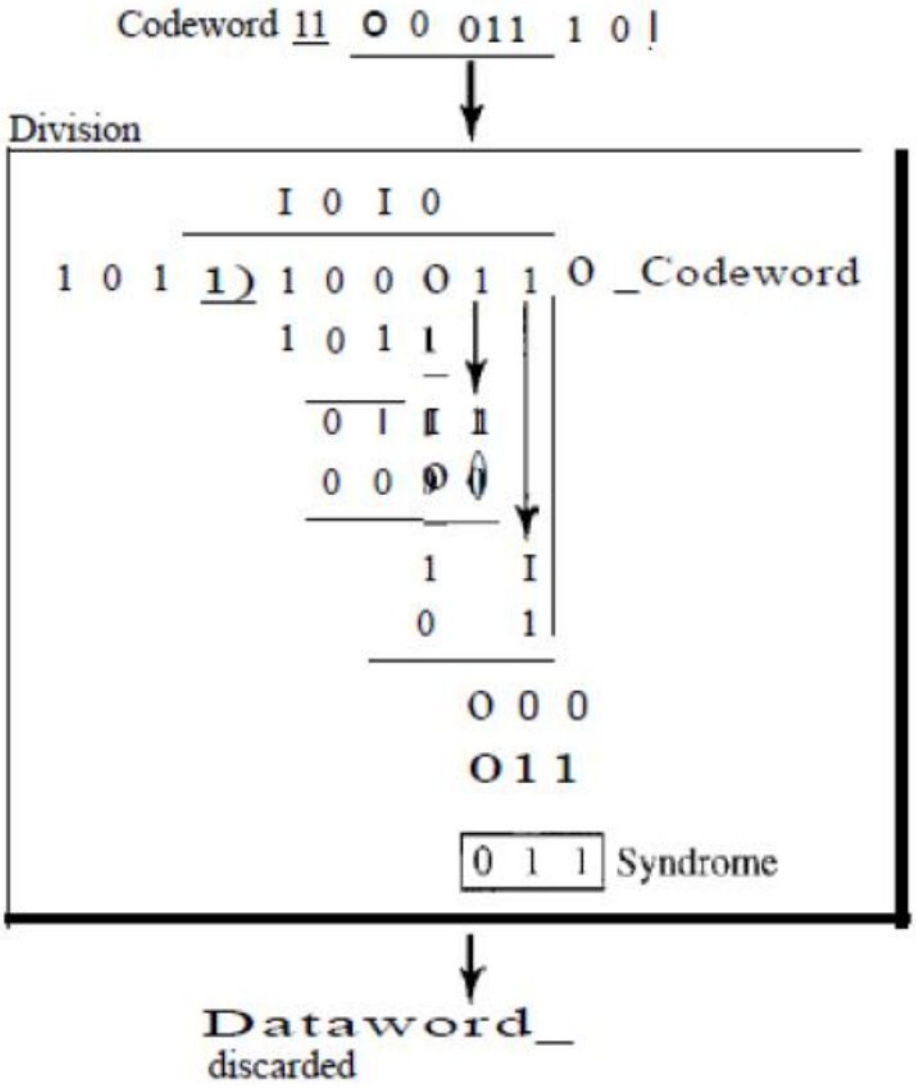
7. Encoder



Codeword 1 1 0 0 1 1 1 0

Dataword Remainder

Decoder:


Codeword 11 0 0 011 1 0
Division
I 0 I 0
1 0 1 1) 1 0 0 0 1 1 0 _Codeword
1 0 1 1
0 1 1 1
0 0 0 0
1 1
0 1
0 0 0
0 1 1
0 1 1 Syndrome
Dataword_
discarded