



ST. LAWRENCE HIGH SCHOOL

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9/8/19



PRE TEST - 2019
CLASS - 12

SUBJECT - COMPUTER APPLICATION SOLUTION
DURATION - 3 HOURS 15 MINUTES

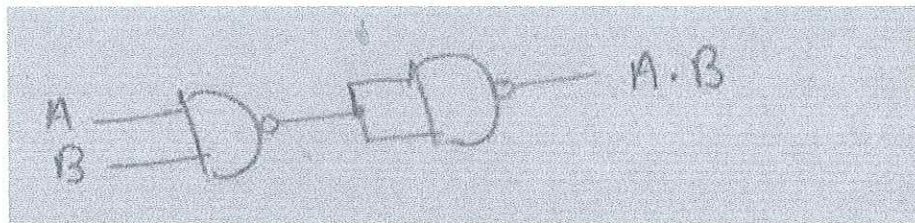
F.M. :70
DATE - 8.8.2019

PART - A
(MARKS: 35)

A) Answer the following questions in short(Alternatives are to be noted): **7X5 = 35**

1. (a) Derive AND & OR gate from NAND gate

A:



(b) Construct a logic circuit for the Boolean Expression:

$$R = \overline{A} \cdot \overline{B} + C \cdot D + \overline{E} \cdot F$$

(2+2) + 3

OR

(a) Draw the truth table, logic circuit & derive the Boolean function for the Sum and Carry for Half-Adder

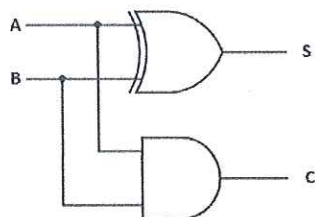
A:

Half Adder – Design

A	B	Sum	C _{out}
0	0	0	0
0	1	1	0
1	0	1	0
1	1	0	1

$$\text{Sum} = \overline{A}B + A\overline{B} = A \oplus B$$

$$C_{\text{out}} = AB$$



(b) If 8 is the number of inputs in a Multiplexer, what is the number of select lines?

A: 3

(2X3) + 1

2. (a) Describe different types of Communication modes.

A: Simplex, Half duplex (HDX), Full duplex (FDX)

(c) What is Client Server Network?

A: A computer network in which one centralized, powerful computer (called the server) is a hub to which many less powerful personal computers or workstations (called clients) are connected. The clients run programs and access data that are stored on the server.

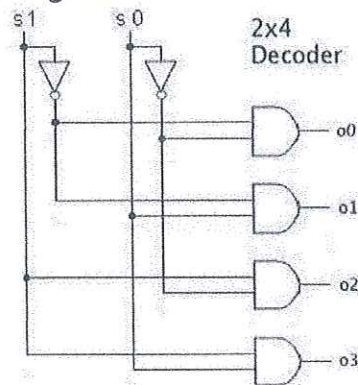
(c) Write a short note on Mesh topology.

3+1+3

A: A mesh network (or simply meshnet) is a local network topology in which the infrastructure nodes (i.e. bridges, switches, and other infrastructure devices) connect directly, dynamically and non-hierarchically to as many other nodes as possible and cooperate with one another to efficiently route data from/to clients.

3. (a) Draw the Logical diagram and Truth table of 2X4 Decoder Circuit.

A: Logic Diagram:



Inputs		Output			
A	B	D ₀	D ₁	D ₂	D ₃
0	0	1	0	0	0
0	1	0	1	0	0
0	1	0	0	1	0
1	1	0	0	0	1

(b) Give two differences between Multiplexer and De-multiplexer.

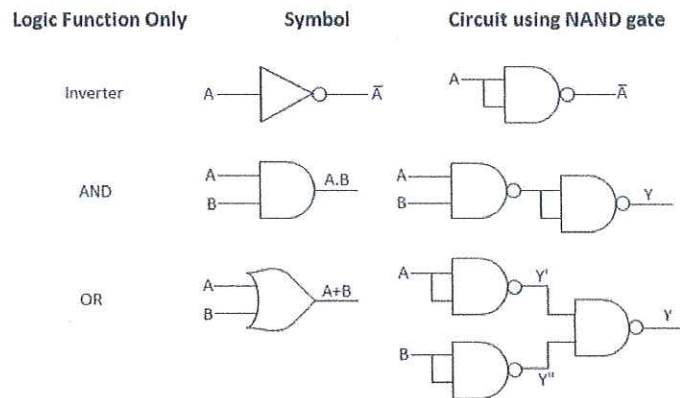
A:

The multiplexer also known as a MUX operates on several inputs but provide a single output. As against demultiplexer also known as DEMUX simply reverses the operation of MUX and operates on single input but transmits the data to multiple outputs.

(2+3)+2

4. (a) Show that NAND gate is Universal.

A:



(b) Draw the truth table for XOR gate?

5+2

A:

Inputs		Outputs
X	Y	Z
0	0	0
0	1	1
1	0	1
1	1	0

5. (a) Describe TCP/IP model.

A: TCP/IP, or the Transmission Control Protocol/Internet Protocol, is a suite of communication protocols used to interconnect network devices on the internet.

TCP/IP specifies how data is exchanged over the internet by providing end-to-end communications that identify how it should be broken into packets, addressed, transmitted, routed and received at the destination. TCP/IP requires little central management, and it is designed to make networks reliable, with the ability to recover automatically from the failure of any device on the network.

(b) How an unordered list is created in HTML?

(c) Mention the functions of Firewall.

A:

- Firewall is device that provides secure connectivity between networks (internal/external).
- It is used to implement and enforce a security policy for communication between networks.
- A firewall may be a hardware, software or a combination of both that is used to prevent unauthorized program or internet users from accessing a private network or a single computer.

3+2+2

PART – B
(MARKS: 35)

B) Select the correct answer from the alternatives :

1X21=21

- i) In this mode of communication data can travel in one direction only:
(a) Full Duplex (b) Half Duplex (c) Simplex (d) Synchronous
- ii) What is the full form of CRC?
(a) Cyclic Rotation Code (b) Cyclic Redundancy Code
(c) Cyclic Revolution Code (d) None of these
- iii) Octal – to – Binary Encoder takes ___ inputs & provides ___ outputs
(a) 3,8 (b) 2,4 (c) 8,3 (d) 4,2
- iv) Multiplexer is sometimes called :
(a) Data Adder (b) Data Subtractor (c) Data Multiplier (d) Data Selector
- v) The transmission mode, which allows both communication devices to transmit & receive data simultaneously is:
(a) Simplex (b) Half-Duplex (c) Both (a) & (b) (d) Full-Duplex
- vi) What type of media is used in a Fibre Optic Cable?
(a) Steel fibre (b) Copper fibre
(c) Glass fibre (d) Plastic fibre
- vii) Satellite communication uses:
(a) Radio waves (b) Microwaves (c) Infra Red waves (d) UV rays
- viii) The first Page of a website is called:
(a) Home Page (b) First Page (c) Main Page (d) Design Page
(b)
- ix) Which is the largest Heading Tag?
(a) H1 (b) H2 (c) H3 (d) H6
- x) Email is downloaded from the mailbox using the protocol:
(a) SMTP (b) POP3 (c) IMAP (d) MIME
- xi) An IP address is how many bits in length?
(a) 16 (b) 32 (c) 48 (d) 64

- xii) Which tag in HTML is used to insert a picture in a web page?
 (a) <picture> (b) <image> (c) (d) <photo>
- xiii) The TCP/IP protocol model is considered to be made up of how many layers?
 (a) 7 (b) 6 (c) 5 (d) 4
- xiv) Using which tag can a numbered list be created in HTML?
 (a) <BL> (b) <NL> (c) (d)
- xv) Which of the following gates is called a Universal gate?
 (a) XNOR (b) NOT (c) NAND (d) XOR
- xvi) How many NOR gates are required to form a NOT gate?
 (a) 1 (b) 2 (c) 3 (d) 4
- xvii) The borrow output for a half subtractor circuit subtracting the bit B from A is given by:
 (a) A+B (b) AB (c) \overline{AB} (d) $\overline{A}B$
- xviii) An encoder circuit is functionally opposite to a :
 (a) Multiplexer (b) De-multiplexer (c) Decoder (d) None of These
- xix) How many inputs are there for a full adder circuit?
 (a) 1 (b) 2 (c) 3 (d) 4
- xx) The default extension of HTML is :
 (a) .NET (b) .HTML (c) .HTM (d) both (b) & (c)
- xxi) The network topology in which devices are not linked to each other & where hub acts as a central controller is:
 (a) Star (b) Ring (c) Mesh (d) Tree

C) Answer the following questions in short(Alternatives are to be noted):

1X14 = 14

i) What is the difference between Container tag & Empty tag?

A:

Container Tags	Empty Tags
<ul style="list-style-type: none"> The tags which include an 'on' tag and the 'off' tag are called container tags. Example :- HTML, TITLE, BODY tags. 	<ul style="list-style-type: none"> In the empty tags there is no 'off' tag, these tags have only 'on' tag. Example :- BR, HR tags.

OR

Differentiate between and .

A: OL tag is used to create an Ordered list of items. But, UL tag is used to create an unordered list of items in the HTML. or bulleted list is an unordered list which means that the items in this list are not placed in a specific order.

ii) What is the function of a repeater?

A: In telecommunications, a repeater is an electronic device that receives a signal and retransmits it. Repeaters are used to extend transmissions so that the signal can cover longer distances or be received on the other side of an obstruction.

OR

What is the use of a router?

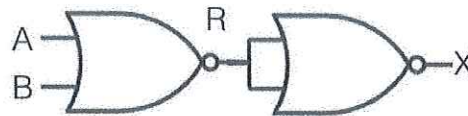
A: The main purpose of a router is to connect multiple networks and forward packets destined either for its own networks or other networks.

iii) Write the full form of CSMA/CD.

A: Carrier Sense Multiple Access / Collision Detection

iv) Implement OR gate using NOR gate.

A:



v) Mention one disadvantage of email.

A: The recipient needs access to the internet to receive email. Viruses are easily spread via email attachments

OR

What do you mean by bandwidth?

A: Bandwidth is also described as the carrying capacity of a channel or the data transfer speed of that channel.

**vi) What is the purpose of
 tag in HTML?**

A: The HTML
 tag is used for creating the 'br' element, which represents a line break in an HTML document.

vii) Write two features of Star topology.

A:

Star Topology

• **Features ;**

- All devices revolve around a central hub / switch.
- Switch / hub controls the network communications & can communicate with other hubs.
- Easy to install.
- No disruptions to the network when connecting / removing devices.
- Requires more cable length than bus topology.
- A failure in any network cable will only take down one computer's network access & not entire LAN.
- If hub fails = entire LAN fails !

viii) Write the truth table of Half-Adder.

A:

Half Adder Truth table

INPUTS		OUTPUTS	
A	B	SUM	CARRY
0	0	0	0
0	1	1	0
1	0	1	0
1	1	0	1

OR

What is a decoder?

A: A device or program that translates encoded data into its original format (e.g., it decodes the data).

ix) Write down the truth table of XOR gate.

A:

Inputs		Outputs
X	Y	Z
0	0	0
0	1	1
1	0	1
1	1	0

x) What is NIC?

A: A network interface card (NIC) is a hardware component, typically a circuit board or chip, which is installed on a computer so that it can connect to a network.

OR

What is TCP/IP?

A: TCP/IP, or the Transmission Control Protocol/Internet Protocol, is a suite of communication protocols used to interconnect network devices on the internet.

xi) Write the full forms of UTP & STP.

A: UTP - Unshielded Twisted pair
STP - Shielded Twisted pair

xii) Write the syntax to insert a picture in HTML.

A:

xiii) How many NAND gates are required to design a NOT gate?

A: 1(one)

xiv) State any one use of a multiplexer circuit.

A: A multiplexer is used in telephone networks to integrate the multiple audio signals on a single line of transmission.

OR

What is the function of an encoder circuit?

A: Encoders are used to translate rotary or linear motion (mechanical movement) into a digital signal. This is for the purpose of monitoring or controlling motion parameters such as speed, rate, direction, distance or position.