

Vivekanand College, Kolhapur (Autonomous)
Department of Electronics
Notice

Date: 21.11.2022

All the students of B.Sc. I Electronics are hereby informed that their internal examination for Semester I will be conducted in offline mode as per attached schedule.

Paper	Section	Section title	Marks	Date	Time
DSC-1005A	I	Analog Electronics-I	15	25.11.2022	04:00 to 05:00 pm
	II	Digital Electronics-I	15	25.11.2022	04:00 to 05:00 pm



(Dr. C. B. Patil)
Head

Department of Electronics
Vivekanand College, Kolhapur.

Shri Swami Vivekanand Shikshan Sanstha's
Vivekanand College, Kolhapur (Autonomous)
Class: B.Sc.-I, Semester-I, Internal Examination (2022-23)

Paper I: DSC-1005A Electronics
Time: 04:00 pm to 05:00 pm

Date:-25/11/2022
Marks: 30

Section- I

Q. 1 Select correct alternative for the following:

[5 x 1 = 5]

1. Boolean multiplication is provided by _____ gate.
a) OR b) AND c) NOT d) NAND
2. In Boolean algebra, $A+A=$ _____ .
a) A b) 2A c) 1 d) 0
3. In K map pair eliminates _____ variables.
a) 0 b) 1 c) 2 d) 3
4. _____gate is used as a universal building block.
a) OR b) NOR c) AND d) NOT
5. Half adder adds.....bits at a time.
a) 0 b) 2 c) 3 d) 4

Q2. Solve any TWO:

[2 x 5 = 10]

1. State and prove Demorgan's theorem (any one) with logic diagram and truth table.
2. Explain basic gates using symbol and truth table and logic equation.
3. Explain full adder with logic diagram and truth table.
4. Explain Ex-OR gate as a controlled inverter.

Section- II

Q. 1 Select correct alternative for the following:

[5 x 1 = 5]

1. The Unit of capacitance is...
a) Farad b) volt c) microvolt d) Ampere
2. The working principle of transformer is based on.....
a) Mutual inductance b) self inductance
c) resistance d) none of these
3. KVL states that the algebraic sum of voltages around a loop mesh is equal to
a) 1 b) 0 c) equal d) none of these
4. For maximum transfer of Power internal resistance of the source should be _____
a) Equal to load resistance b) less than load resistance
c) greater than load resistance d) infinite
5. Resistance for brown black yellow _____
a) 10k b) 100k c) 12k d) 3k

Q.2.Solve any TWO:

[2 x 5 = 10]

1. Explain working principle and construction of transformer.
2. Give classification of capacitor and explain construction of electrolytic capacitor.
3. Explain working of electromagnetic relay.
4. Give the working principle of inductor and explain any one type of inductor.



13/15

॥ ज्ञान, विज्ञान आणि सुसंस्कार यांसाठी शिक्षण प्रसार ॥

- शिक्षणमहर्षी डॉ. बापूजी साळुंखे

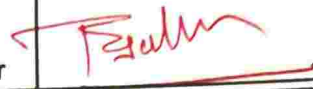
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Suppliment No. : 1

Roll No. : 7289

Class : BSC-I

Subject : Electronics.

Test / Tutorial No. :

Div. : A.

Q.1. Section 1.

1)

→ Boolean multiplication is provided by AND gate.

2)

→ In Boolean algebra, $A+A = 1$

3)

→ In K-map pair eliminates 1 variables.

4)

→ NOR gate is used as a universal building block

5)

→ Half adder adds 2 bits at a time.

Q.2.

1]

→ Demorgan's first theorem:

statement: The complement of product of two inputs variable is equal to the sum of complement of each variable.

$$Y = \overline{A \cdot B} = \overline{A} + \overline{B}$$

proof:-

Case I] $A=0, B=0$.

$$\text{L.H.S} = \overline{0 \times 0} = \overline{0} = 1$$

$$\text{R.H.S} = \overline{0} + \overline{0} = 1 + 1 = 1$$

$$\text{L.H.S} = \text{R.H.S.}$$

Case II] $A=0 \text{ \& } B=1$.

$$\text{L.H.S} = \overline{0 \times 1} = \overline{0} = 1$$

$$\text{R.H.S} = \overline{0} + \overline{1} = 1 + 0 = 1$$

$$\text{L.H.S} = \text{R.H.S.}$$

Case III]

$A=1 \text{ \& } B=0$.

$$\text{L.H.S} = \overline{1 \times 0} = \overline{0} = 1$$

$$\text{R.H.S} = \overline{1} + \overline{0} = 0 + 1 = 1$$

$$\text{L.H.S} = \text{R.H.S.}$$

Case IV] $A=1 \text{ \& } B=1$.

$$\text{L.H.S} = \overline{1 \times 1} = \overline{1} = 0$$

$$\text{R.H.S} = \overline{1} + \overline{1} = 0 + 0 = 0$$

Truth Table:

A	B	$\overline{A \cdot B}$	$\overline{A} + \overline{B}$
0	0	1	1
0	1	1	1
1	0	1	1
1	1	0	0

2)

→ Logic gate :- it is a electrical circuit which has two or more inputs & only one output.

Types of Gates.

1) Basic gates

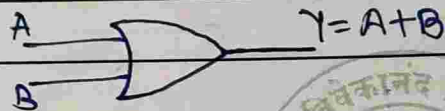
2) Derived gates.

In Basic gates there are three types.

i) OR gate :-

It gives high output when one of the input is high.

Diagram =



Logic eqⁿ = $Y = A + B$.

Truth Table :-

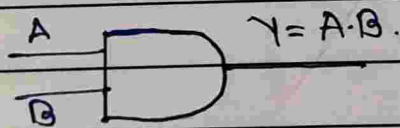
Input		Output
A	B	$Y = A + B$
0	0	0
0	1	1
1	0	1
1	1	1

ii) AND gate :- it gives high/low

when AND gate when all inputs are high then the output is high.

Logic equation :- $Y = A \cdot B$.

Diagram :-

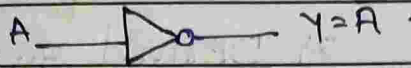


Truth Table :-

Input		Output
A	B	$Y = A \cdot B$
0	0	0
0	1	0
1	0	0
1	1	1

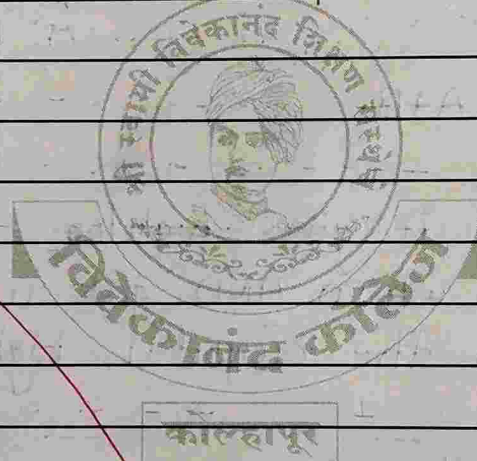
iii) ~~or~~ NOT gate: It gives high output when input is low. (Invert or compliment).

Logic equation: $Y = \bar{A}$.



Truth Table:

Input	Output.
0	1
1	0

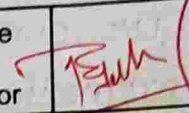


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Suppliment No. : 2.

Roll No. : 289

Class : BSC-I

Subject : Electronics.

Test / Tutorial No. :

Div. : A

Section II.

Q.1.

1]

→ The Unit of capacitance is Farad.

2]

→ The working principal of transformer is based on mutual inductance.

3] ~~K_V~~

→ KVL states that the algebraic sum of voltages around a loop mesh is equal to 0.

4] For maximum transfer of power ~~internal~~ resistance of the source should be equal to load resistance.

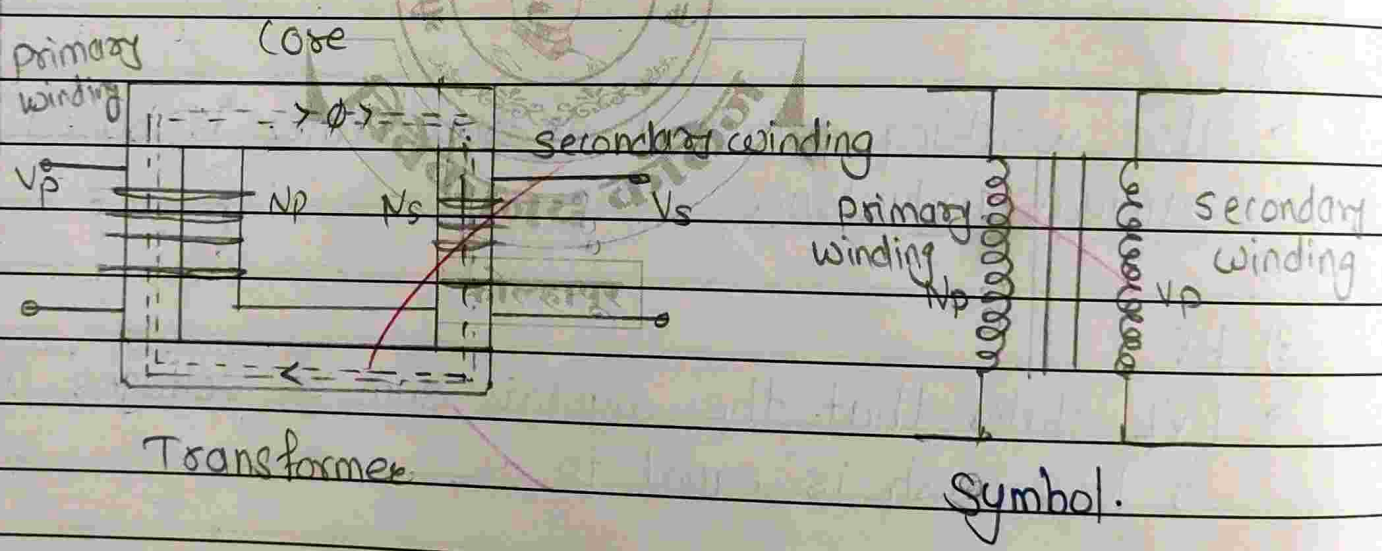
5]

→ Resistance for brown black yellow 10k.

1)

→ Transformer: A transformer is a electric passive electric device which transfer electric energy into the one circuit to another. In this transformer the electromagnetic induction process is used. The transformer is device is used on principal of mutual inductance.

A single phase voltage transformer basically consist of two coil of wire, one of it called primary winding and other is secondary winding. When a electric current is passing through a primary winding, a magnetic field is developed & induced the voltage across the primary winding.



Notice that, the electro two coils are not electrically connecting but are linked mechanically. The transformer which is used for "increase" the voltage on the secondary winding with respect to its primary winding. The it is called as a set-up transformer. Transformer which used to "decrease" voltage on the secondary voltage with respect to primary voltage is eq called step down transformer.

The transformer is used for same voltage is on its secondary winding with primary winding is equal called as equivalent transformer.

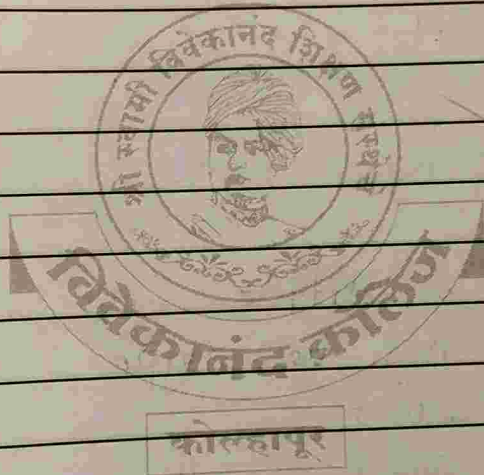
The

$\frac{V_1}{N_1} = \frac{V_2}{N_2}$

$$V_1 = \frac{N_2}{N_1} V_2$$

2]

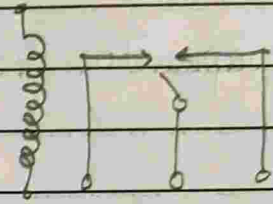
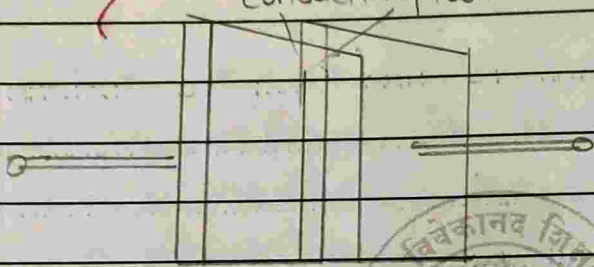
Capacitor :-



Q]

→ Capacitor :- The capacitance is component which has ability "capacity" to store electromagnetic circuit electric energy in one the ~~to~~ one plate to another plate. when The capacitor by producing a potential difference across its plate.

In this its basic form. The capaci.
conductive plate



symbol.

In this its basic form..

Capacitor is different
capacitor has two type.

1] Fixed capacitor

1] Non-linear capacitor.

1] Ceramic

2] mica

3] Paper

4] plastic.

2] linear capacitor.

1] Aluminium capacitor

Tantalum capacitor.

2] Variable capacitor.

1] Air gang capacitor.

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Subject : Electronics

Test / Tutorial No. : Internal

Div. : A

Suppliment No. : 1

Roll No. : 7306

Class : BSC-I

Section - I

- Q. 1.
- 1) Boolean multiplication is provided by AND gate.
 - 2) In Boolean algebra, $A+A = A$.
 - 3) In K map pair eliminates 2 variables.
 - 4) NOR gate is used as a universal building block.
 - 5) Half adder adds 2 bits at a time.

Q. 2.

1) Demorgan's theorem:-

The complement two product variables is equal to the complement of sum of two variables.

1) when $A=0$ $B=0$

$$\overline{A \cdot B} = \overline{0 \cdot 0} = \overline{0} = 1$$

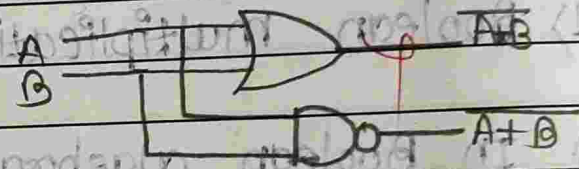
and $\overline{A+B} = \overline{0+0} = \overline{0} = 1$

2) when $A=0$ $B=1$
 $A \cdot B = 0 \cdot 1 = 0 = 1$
 and $\bar{A} + \bar{B} = 0 + 1 = 1$

3) when $A=1$ $B=0$
 $A \cdot B = 1 \cdot 0 = 0 = 1$
 and $\bar{A} + \bar{B} = 1 + 0 = 1$

4) when $A=1$ $B=1$
 $A \cdot B = 1 \cdot 1 = 1 = 0$
 $\bar{A} + \bar{B} = 1 + 1 = 0$

Truth table :-



A	B	$A \cdot B$	$\bar{A} + \bar{B}$
0	0	0	1
0	1	0	1
1	0	0	1
1	1	1	0

The complement of sum of two variables is equal to complement of two product variables.

1) when $A=0$ $B=0$
 $\bar{A} + \bar{B} = 0 + 0 = 0 = 1$
 and $A \cdot B = 0 \cdot 0 = 0 = 1$

2) when $A=0$ $B=1$
 $\bar{A} + \bar{B} = 0 + 1 = 0 = 1$
 and $A \cdot B = 0 \cdot 1 = 0 = 1$

3) when $A=1$ $B=0$ - $A \cdot B$ (AND) (3)
 $\overline{A+B} = \overline{1+0} = 0$
 and $\overline{A \cdot B} = \overline{1 \cdot 0} = 0$

4) when $A=1$ $B=1$
 $\overline{A+B} = \overline{1+1} = 0$
 $\overline{A \cdot B} = \overline{1 \cdot 1} = 0$

Truth table:-

A	B	$\overline{A+B}$	$\overline{A \cdot B}$
0	0	0	0
0	1	0	0
1	0	0	0
1	1	0	0

2) OR Gate:- When one of the inputs is high output also high is called as OR gate.

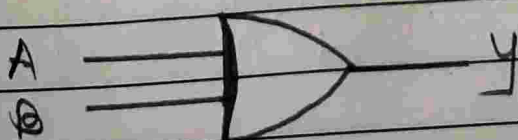
Truth table:-

A	B	Y
0	0	0
0	1	1
1	0	1
1	1	1

Symbol:-

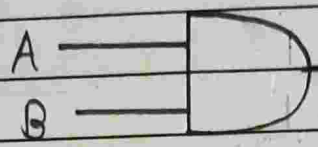
equation:-

$$y = A + B$$



② AND Gate:- When all inputs are high output also high is called as AND gate.

Symbol:-



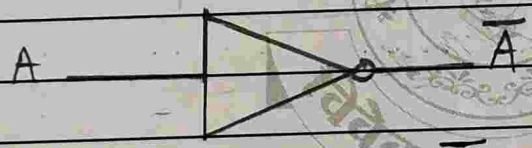
equation :- $y = A \cdot B$

Truth table:-

A	B	Y
0	0	0
0	1	0
1	0	0
1	1	1

③ NOT Gate:- When complement of inputs is called as NOT Gate.

Symbol:-



equation :- $A = \bar{A}$

Truth table:-

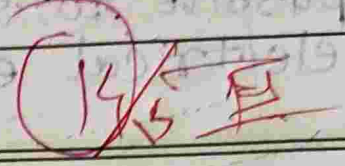
A	\bar{A}
0	1
1	0

$A + A = 1$

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Suppliment No. : 1

Roll No. : 7906

Class : BSC-I

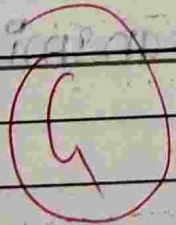
Subject : Electronics

Test / Tutorial No. : Internal

Div. : A

Section - II

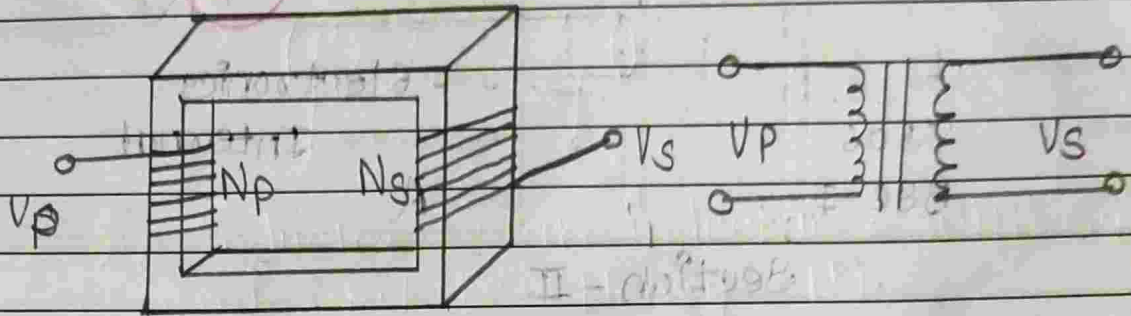
- 1) The unit of capacitance is Farad.
- 2) The working principal of transformer is based on Mutual Inductance.
- 3) KVL states that the algebraic sum of voltages around a loop mesh is equal to 0.
- 4) For maximum transfer of power internal resistance of the source should be Equal to load resistance.
- 5) Resistance for brown black yellow 10k



Q. 2.

1) Transformer:-

The transformer is a electrical device passive to store energy in the form of electrical energy.



transformer.

The transformer used 'increased' voltage on to secondary winding with respect to primary winding is called as step-up transformer. The transformer used 'decrease' voltage on to secondary winding with respect to primary is called as step-down transformer.

In third condition transformer same as voltage secondary winding applied its primary winding is called as Isolation.

$$\frac{N_p}{N_s} = \frac{V_p}{V_s} = n = \text{turns ratio.}$$

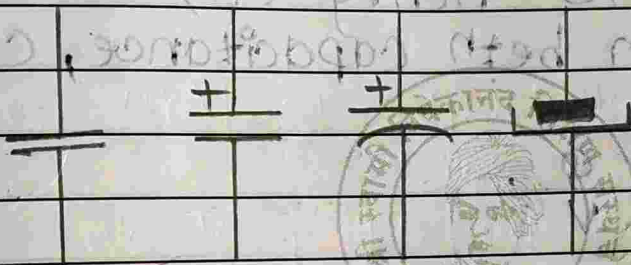
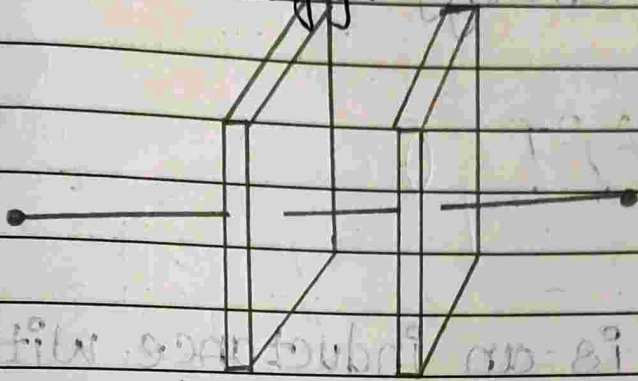
The ratio called as transmission of an transformer.

Types of transformer -

- 1) Step-up transformer
- 2) Step-down transformer
- 3) Power transformer
- 4) Auto transformer
- 5) Isolation transformer

2) Capacitor:-

An capacitor is a electric device which is capable to store energy in the form of magnetic energy.



A capacitor The main property of capacitor it's opposes change in current. In other words, the resist of capacitor opposed to change in current but will stated state Dc current is pass.

$$C = \frac{\epsilon A}{d}$$

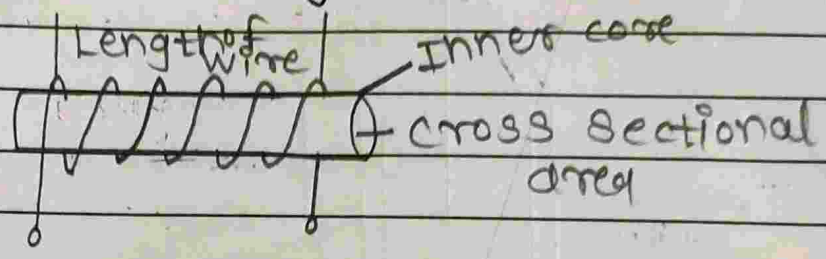
Where, C = Capacitance of capacitor
 ϵ = permittivity of mutual inductance
 A = area of two plater
 d = distance betn two plates.

The capacitance measure amount of charge of capacitor. The SI unit of capacitance is Farad (F).

Q.

4) Inductor :-

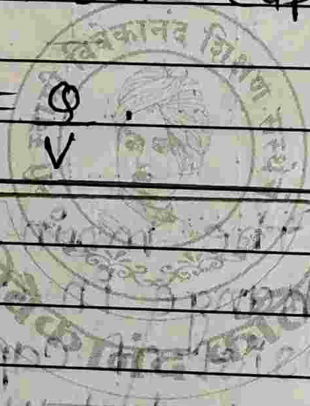
An inductor is a passive electrostatic device which can store energy in the form of magnetic energy.



An inductor is an inductance with symbol 'L' and unit is 'Henry' (H).

The relation between capacitance, charge and Voltage is

$$C = \frac{Q}{V}$$



$C = \frac{Q}{V}$
 $C = \frac{Q}{\frac{Q}{\epsilon_0 \epsilon_r \frac{A}{d}}}$
 $C = \epsilon_0 \epsilon_r \frac{A}{d}$

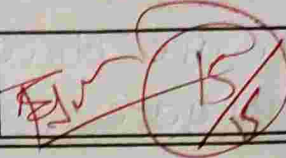
The capacitance increases with the area of the plates and decreases with the distance between the plates.

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Roll No. : 7318

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Subject : Electronics

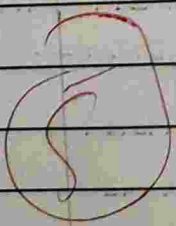
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Div. : A

Q1

SECTION - I

1. Boolean multiplication is provided by AND gate.
2. In Boolean algebra, $A+A = \underline{A}$.
3. In K map pair eliminates 1 variables.
4. NOR gate is used as a universal building block.
5. Half adder adds 2 bits at a time.



There are three types of basic gates:

1) AND gate 2) OR gate 3) NOT gate

1) AND gate (IC 7404) :-

Logic Statement: when both inputs are high output is high.

Logic equation: $Y = A \cdot B$

Symbol:



Truth table:

Input		output
A	B	Y
0	0	0
0	1	0
1	0	0
1	1	1

Use:- AND gate is used for Boolean Multiplication

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Subject : Electronics

Test / Tutorial No. :

Div. : A

3] For that purpose EX-OR gate can be used.

4] In controlled inverter when INVERT is low

(a). $Y = A$

5] In controlled inverter when INVERT is high

(i). $Y = \bar{A}$

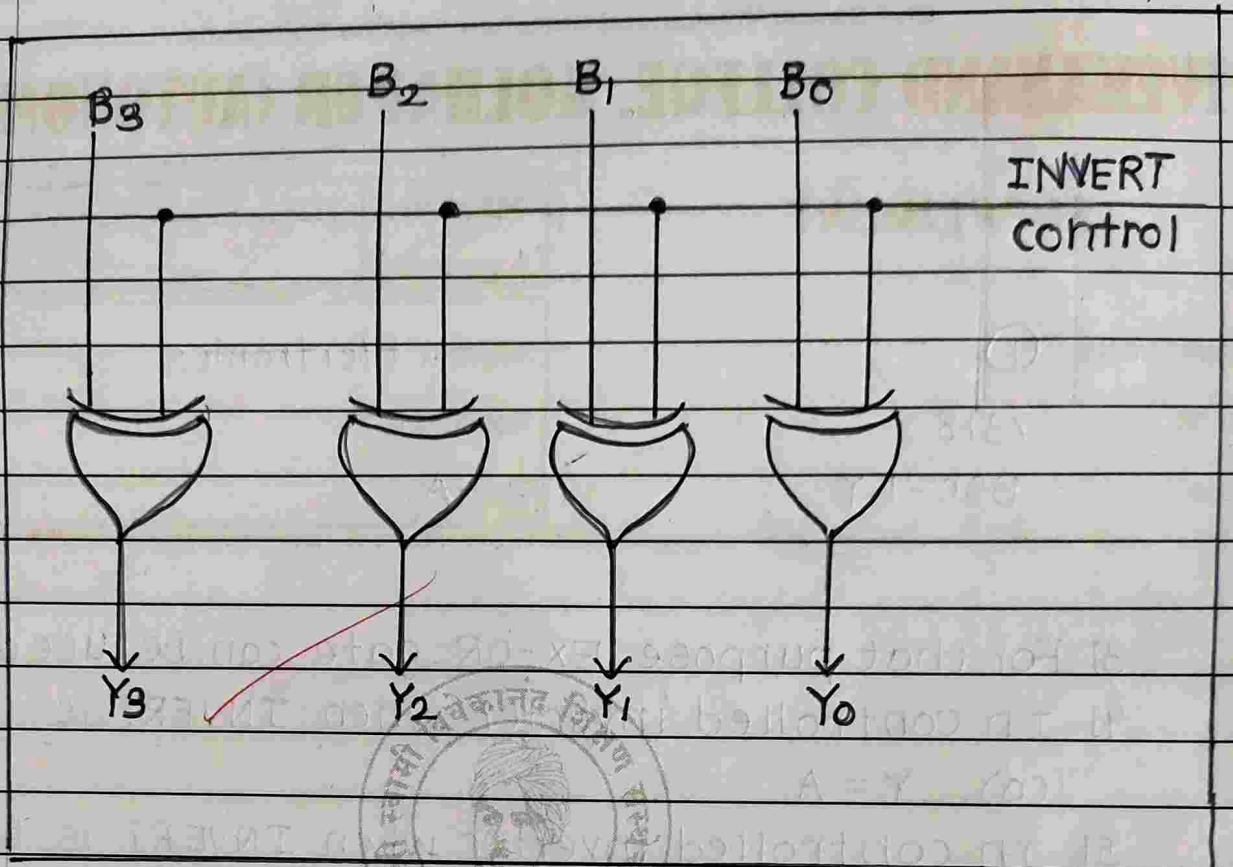
Truth table :-

Input	Output	INVERT
A	A	0
A	\bar{A}	1

6] EX-OR gate as 4-bit controlled inverter :

1] 4-bit controlled inverter consists of 4 EX-OR gates and 4 controlled inverters as show in diagram given below :

2] It also consist of a single common invert line.



EX-OR as 4-bit controlled inverter

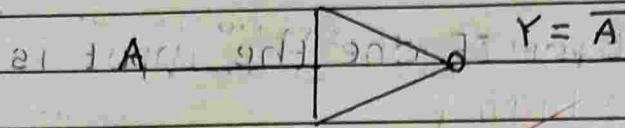
2) Here, when $INVERT = 0$
 The outputs $Y_0 Y_1 Y_2 Y_3$ are same as
 $B_0 B_1 B_2 B_3$

3) When $INVERT = 1$

The outputs $Y_0 Y_1 Y_2 Y_3$ are get complemented

4) That's how INVERTER works

symbol :

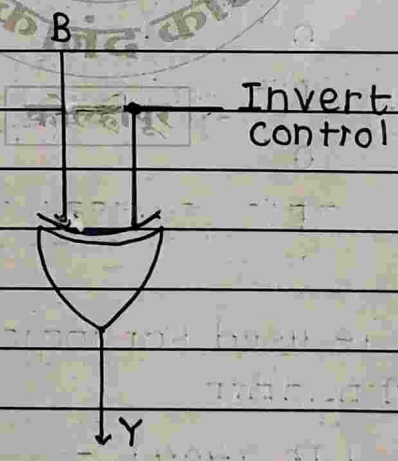


Truth table :-

Input	output
A	Y
0	1
1	0

Use :- It acts as a inverter .

Q4.



EX-OR gate as controlled inverter

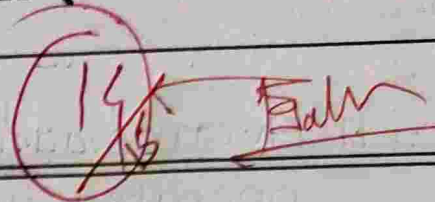
- 1) In basic NOR gate their no control over inverting operation .
- 2) But Indigital circuit it is required to have control over inverting operations .

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Roll No. : 7318

Class : BSC-FY

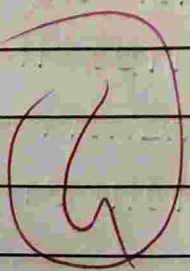
Subject : Electronics

Test / Tutorial No. :

Div. : A

SECTION - II

1. The unit of capacitance is Farad
2. The working principle of transformer is based on Mutual inductance
3. KVL states that the algebraic sum of voltages around a loop mesh is equal to 0
4. For maximum transfer of power internal resistance of the source should be Equal to load resistance
5. Resistance for brown black yellow 10K

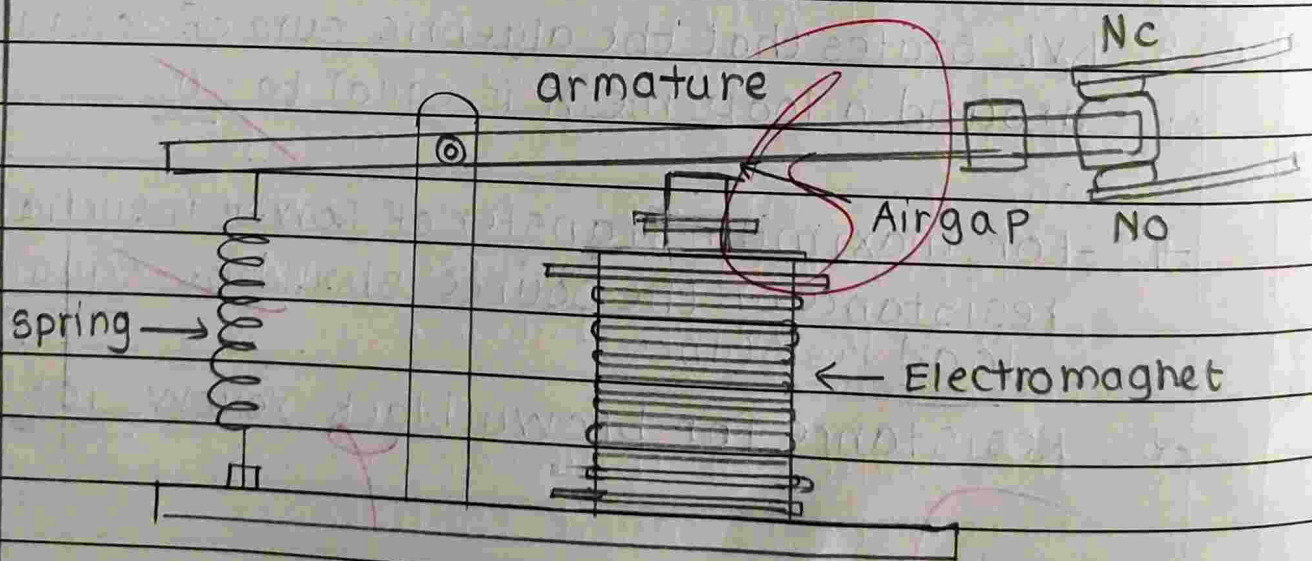


Q2-

3.

- 1] Electromagnetic relay is a electronic switch operated using electromagnetic coil.
- 2] It consists of a solenoid which have Fixed iron core and armature.
- 3] When coil is energized the armature is pulled against stator which completes the circuit.
- 4] Spring is used often to provide Force to a armature to keep it away From a stator.

Construction :-



Working :-

- 1) Electromagnetic relay consists of various components such as electromagnet, Fixed portion, armature, spring.
- 2) When electric supply is given to a coil terminals of coil the relay get energized and circuit gets ON.
- 3) When there is no supply given to terminals of coil the relay is deenergized and circuit gets OFF.

1) An inductor is a passive electronic components which have ability to store electrical energy in the form of magnetic energy

2) Inductor is also called as choke or coil.

3) The main property of a inductor is it opposes the change in current.

4) An inductor opposes the change in current due its self-induced energy in magnetic coil.

5) In other words, Inductor opposes or resists change in current but it easily passes normal DC current.

6) The ability of inductor to resist the change in current is called Inductance

7) Symbol of inductance is L and its SI unit is Henry (H)

• Type of inductor

1) Air-core inductor



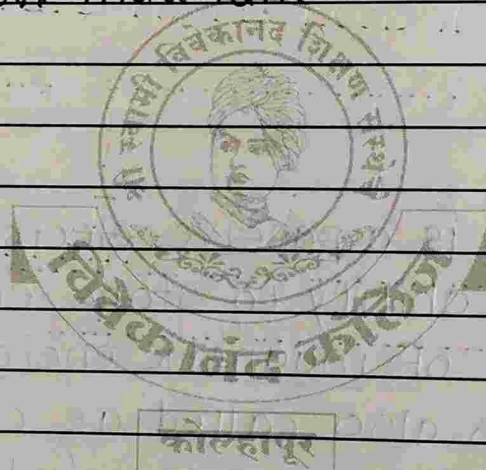
symbol of Air-core inductor

1) Ceramic inductor is referred as a Air-core inductor.

2) It has no magnetic property

3) It have low inductance.

5

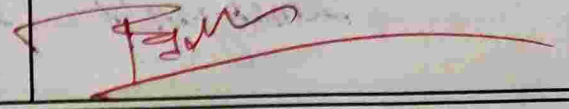


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Suppliment No. : 1.

Roll No. : 7344

Class : FYBSc.

Subject : *Electronics*

Test / Tutorial No. :

Div. : A.

Section - I.

Q1.

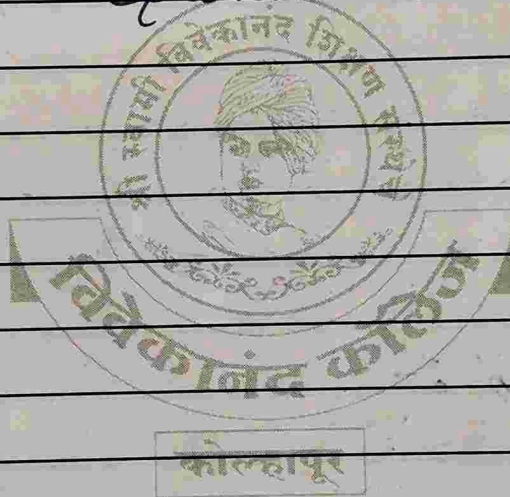
1 ⇒ b) AND

2 ⇒ a) A

3 ⇒ b) 1.

4 ⇒ b) NOR

5 ⇒ b) 2.



Q2.

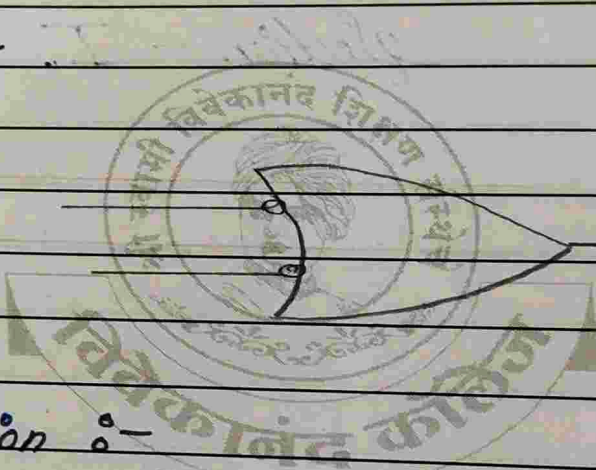
1 \Rightarrow DeMorgan's theorem :-

DeMorgan's 1st theorem :-

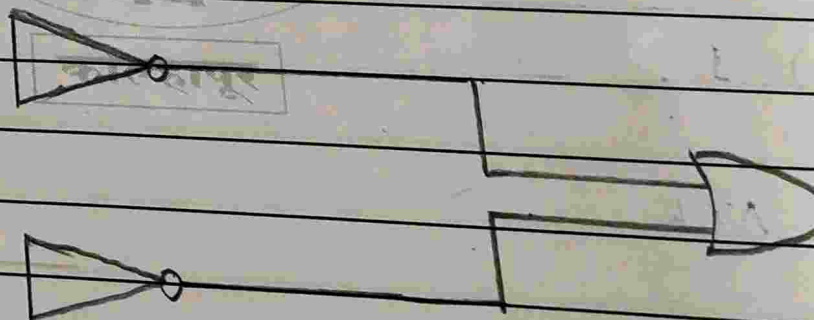
Compliment of logical
of two variables is equal to logic
compliment of sum of two variables

Logical equation :- $\overline{A \cdot B} = \overline{A} + \overline{B}$

Symbol :-



Construction :-



It's proof :-

Case I :-

When, $A=0$, $B=0$.

$$\text{LHS} = \overline{A \cdot B}$$

$$= \overline{0 \cdot 0}$$

$$= \overline{0}$$

$$= 1$$

$$\begin{aligned}
 \text{RHS} &= A+B \\
 &= \bar{0} + \bar{0} \\
 &= \bar{0} \\
 &= 1
 \end{aligned}$$

Case II :-

When $A=0$ & $B=1$.

$$\begin{aligned}
 \text{LHS} &= \overline{A \cdot B} \\
 &= \overline{0 \cdot 1} \\
 &= \bar{0} \\
 &= 1
 \end{aligned}$$

$$\begin{aligned}
 \text{RHS} &= \overline{A+B} \\
 &= \overline{0+1} \\
 &= \overline{1+0} \\
 &= \bar{1} \\
 &= 0
 \end{aligned}$$

Case III :-

When $A=1$ & $B=0$.

$$\begin{aligned}
 \text{LHS} &= \overline{A \cdot B} \\
 &= \overline{1 \cdot 0} \\
 &= \bar{0} \\
 &= 1
 \end{aligned}$$

$$\begin{aligned}
 \text{RHS} &= \overline{A+B} \\
 &= \overline{1+0} \\
 &= \overline{0+1} \\
 &= \bar{1} \\
 &= 0
 \end{aligned}$$

Case IV :-

When, $A=1$ & $B=0$.

$$\begin{aligned} \text{LHS} &= \overline{A+B} \\ &= \overline{1+0} \\ &= \overline{1} \\ &= 0. \end{aligned}$$

$$\begin{aligned} \text{RHS} &= \overline{A+B} \\ &= \overline{1+0} \\ &= 0+0 \\ &= 0. \end{aligned}$$

Truth table :-

A	B	Sum	Carry
0	0	1	1
0	1	1	1
1	0	1	1
1	1	0	0

Q2 3 :-

Full Adder :-

Full adder is a logical circuit or digital circuit which is used for addition of three binary digits or addition of three bits.

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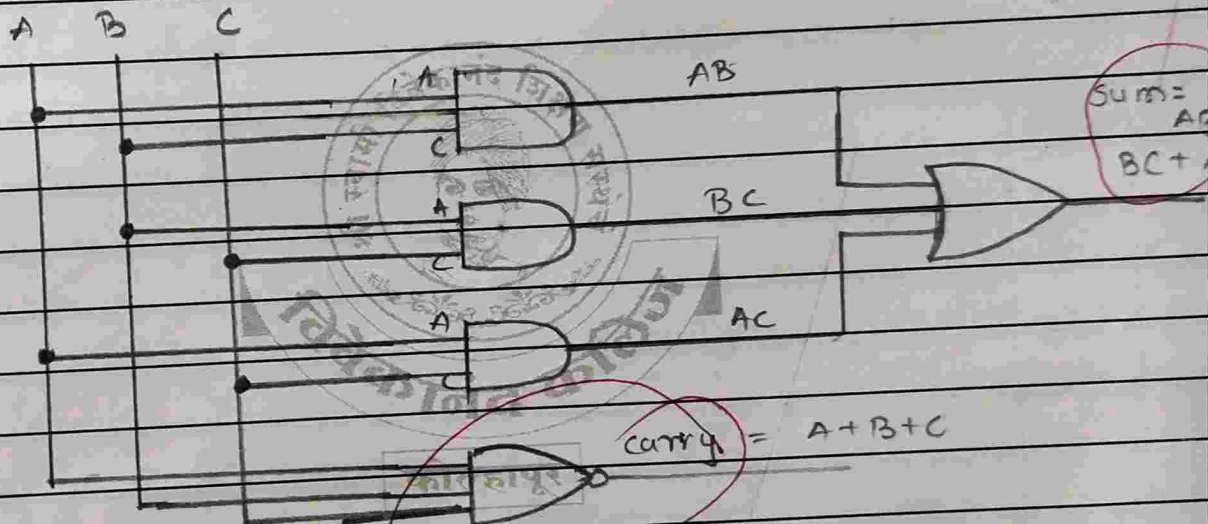
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$Sum = AB + BC + AC$

$Carry = A + B + C$

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- शिक्षणमहर्षी डॉ. बापूजी साळुंखे

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Suppliment No. : 2

Roll No. : 7344

Class : FY BSc.

Section - II

Q1

1 ⇒

a) Farad

2 ⇒

a) Mutual Inductance

3 ⇒

c) equal

4 ⇒

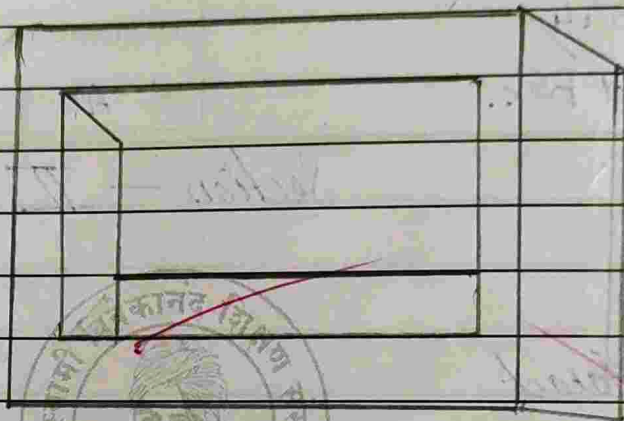
a) greater than load resistance

5 ⇒

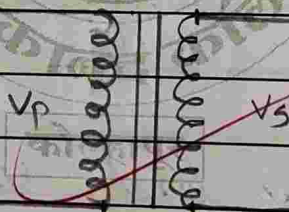
b) 100K

Q2.

1 \Rightarrow Transformer :- The transformer is the passive electrical circuit where electrical energy is transfer from one circuit to other circuit. by electric process.



Symbol of transformer :-



increase

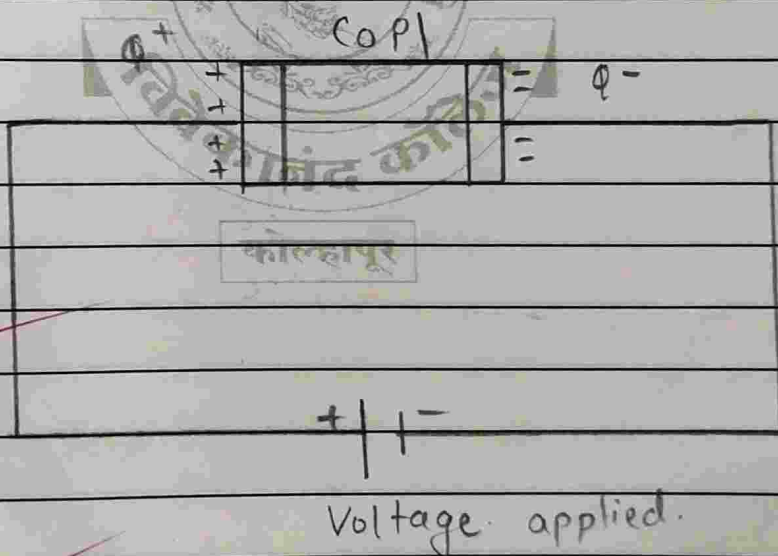
When the \uparrow voltage is applied on the 'Secondary Winding' with the Primary Winding then transformer is Step-Up transformer. When the decrease in voltage then on the Secondary Winding with Primary Winding then the transformer is Step-Down Transformer.

Like wise in the third condition the voltage is same as Secondary Winding with the Primary

Winding then the transformer is called as Inductance Transformer.

Q2

Q2. Capacitor :- Capacitor is a device which ~~whose~~ has ability or 'Capacity' to store energy in the form of electric charge.
 app Potential energy.

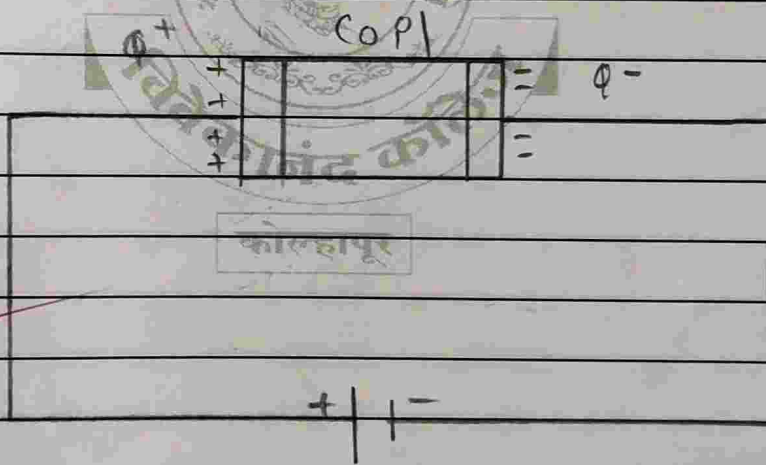


The DC voltage applied on the circuit whose positive (+ve) current quickly accumulates to one plate and negative (-ve) current accumulates to another plate.

Winding then the transformer is called as Inductance Transformer.

Q2

Q2. Capacitor :- Capacitor is a device which ~~whose~~ has ability or 'Capacity' to store energy in the form of electric charge. Potential energy.



The DC voltage applied on the circuit whose positive (+ve) current quickly accumulates to one plate and negative (-ve) current accumulates to another plate.

14/15

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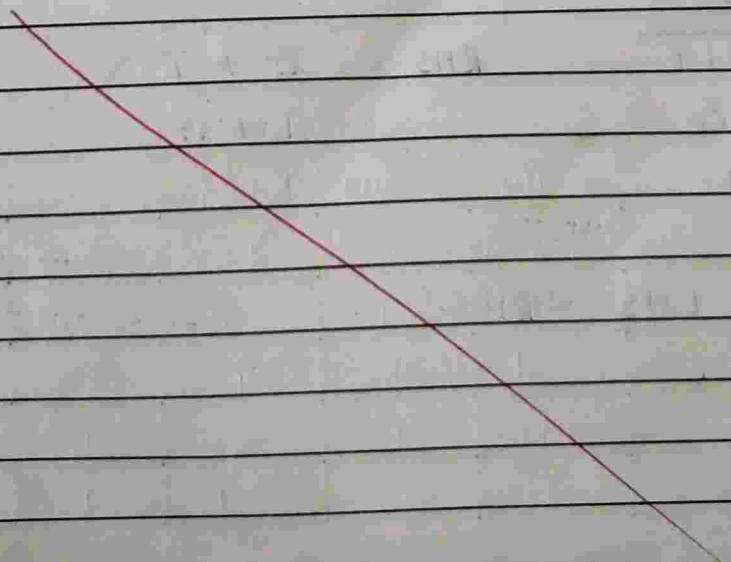
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Div. :

Q1.

- 1) Boolean multiplication is provided by AND gate.
- 2) In boolean algebra, $A+A = \underline{A}$
- 3) In k map pair eliminates 2 variables.
- 4) NOR gate is used as a universal building block.
- 5) Half adder adds 2 bits at a time.

04



Q2.

1) De Morgan's theorem :-

$$\overline{A \cdot B} = \overline{A} + \overline{B}$$

Statement :- Demorgan's theorem states that when we take complement of any product of any two single bit inputs it is equivalent to Addition of compliments of each input individual.

$$\overline{A \cdot B} = \overline{A} + \overline{B}$$

Logic diagram

Proof :-

1) consider, $A=0$ $B=0$

LHS = $\overline{0 \cdot 0}$	RHS = $\overline{0} + \overline{0}$
= $\overline{0}$	= $1 + 1$
= 1	= 1

∴ LHS = RHS

2) $A=0$, $B=1$

LHS = $\overline{0 \cdot 1}$	RHS = $\overline{0} + \overline{1}$
= $\overline{0}$	= $1 + 0$
= 1	= 1

∴ LHS = RHS

3) $A = 1$ $B = 0$

$$\text{LHS} = \overline{A \cdot B}$$

$$= \overline{1 \cdot 0}$$

$$= \overline{0}$$

$$= 1$$

$$\text{RHS} = \overline{A} + \overline{B}$$

$$= \overline{1} + \overline{0}$$

$$= 0 + 1$$

$$= 1$$

$\therefore \text{LHS} = \text{RHS}$

4) $A = 1$ $B = 1$

$$\text{LHS} = \overline{1 \cdot 1}$$

$$= \overline{1}$$

$$= 0$$

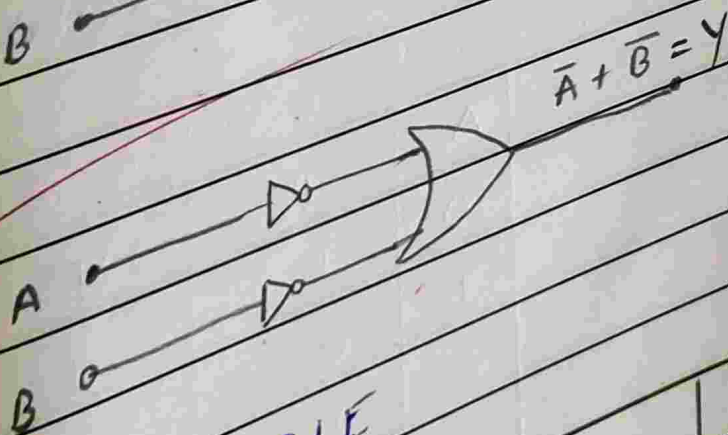
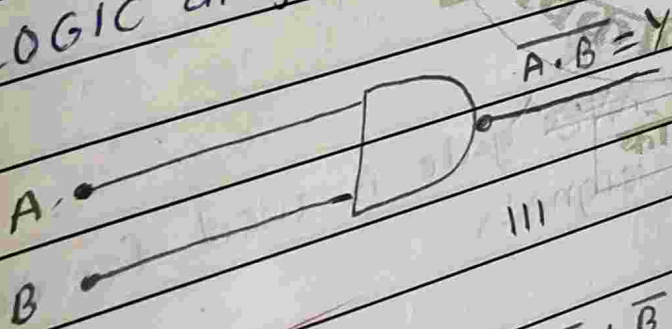
$$\text{RHS} = \overline{1} + \overline{1}$$

$$= 0 + 0$$

$$= 0$$

$\therefore \text{LHS} = \text{RHS}$

LOGIC diagram :-



In this logic diagram at LHS NAND gate is used and as we know that NAND gate is logical equivalent of bubbled or gate which is shown in logic diagram below.

TRUTH TABLE

LHS	RHS
$\overline{A \cdot B}$	$A + B$
1	1
0	0

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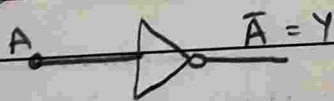
Class :



$$Y = A \cdot B$$

A	B	$Y = A \cdot B$
0	0	0
0	1	0
1	0	0
1	1	1

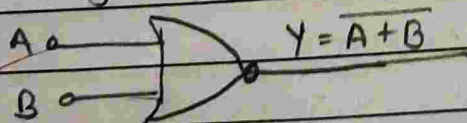
3) NOT gate :- NOT gate is used to give complement of input signal.



A	Y
0	1
1	0

4) NOR gate :- NOR gate is made by combining two gates OR and NOT

It gives low output when any of input is high.



A	B	$\overline{A+B}$
0	1	0
1	0	0
1	1	0
0	0	1

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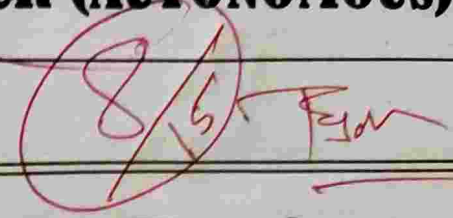
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SECTION II

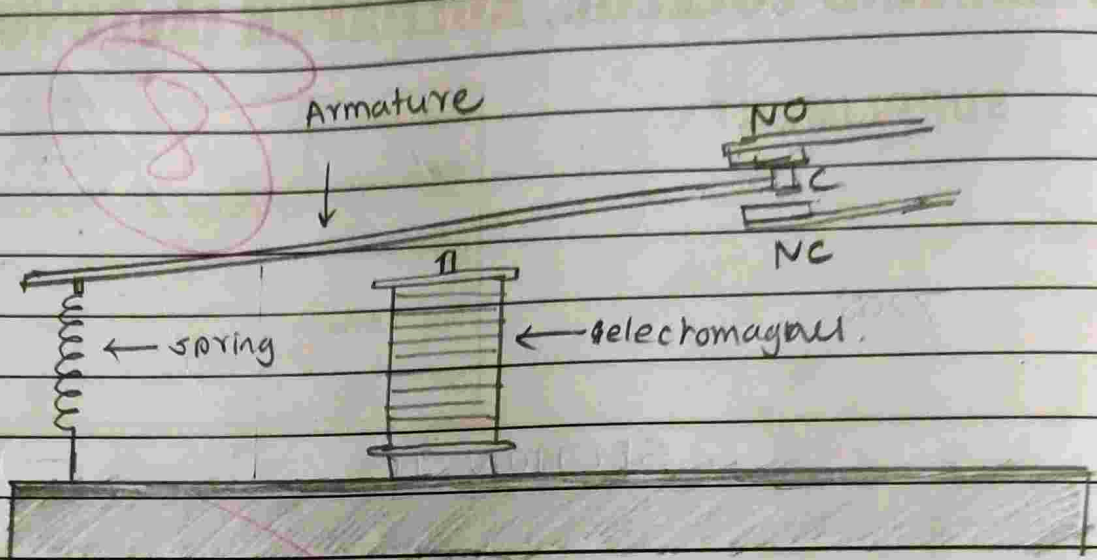
Q1.

1. Unit of capacitance is Farad
2. The working principal of transformer is based on mutual inductance.
- 3) KVL states that the algebraic sum of voltages around a loop mesh is equal to 0
- 4) For maximum transfer of power internal resistance of source should be less than load resistance
- 5) Resistance of brown black yellow 12k Ω

3

Q2.

3. Working of Electromagnetic relay :-



- i) Electromagnetic relay ~~work~~ is mechanical device where it consist a spring, an armature, an electromagnet, connector.
- ii) When current passes through a coiled iron core which work as a strong magnet or electromagnet.
- iii) Once electromagnet is charged it attracts the armature and closes the circuit and which completes the loop.
- iv) as soon as magnet gets discharged due to stopped flow of current the spring pulls it towards its original position and it breaks the circuit.
- v) ~~Armature~~ is used to hold. Spring is used to hold the armature in its original position after discharge of current.