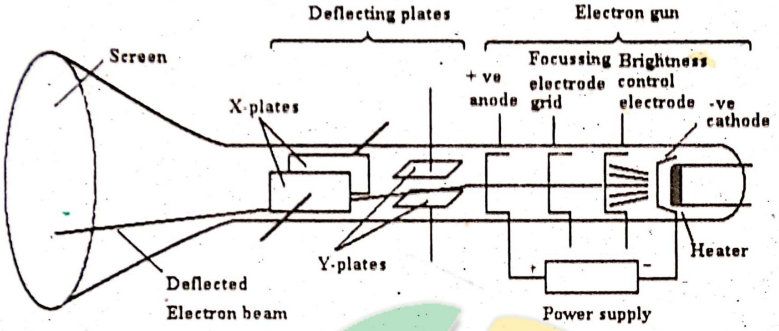
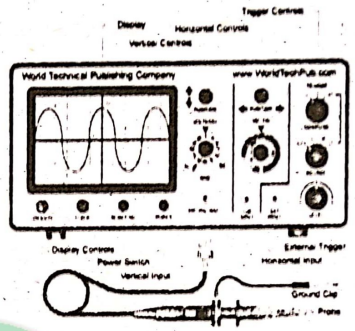
CHAPTER 16

BASIC ELECTRONICS

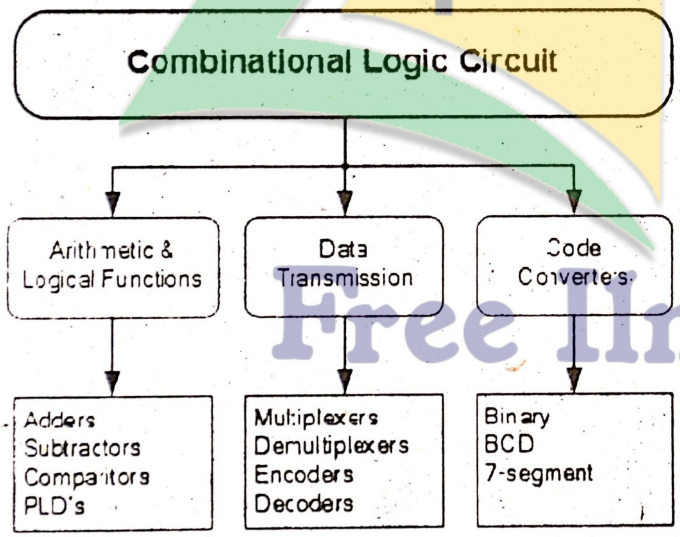
CATHODE RAY OSCILLIOSCOPES

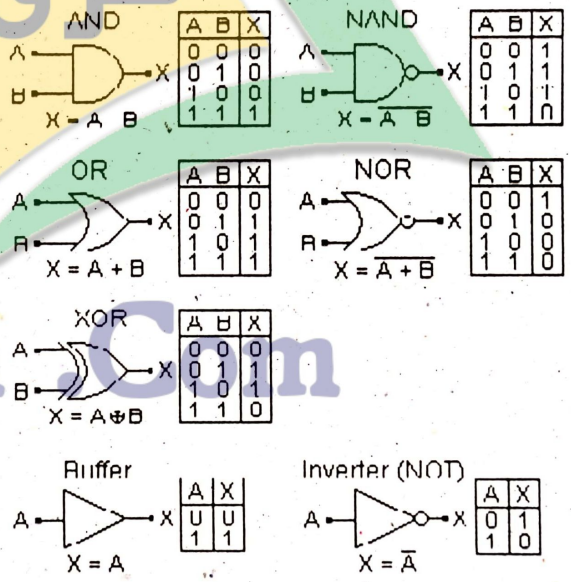
28.1.11 Cathode ray oscilloscope





DIGITAL ELECTRONICS AND LOGIC GATES





MULTIPLE CHOICE QUESTIONS

16.1 Thermionic Emission
16.2 Investigating the properties of Electrons
16.3 Cathode-Ray Oscilloscope (C.R.O)

(1) The branch of applied physics which deals with the behaviour of electrons using different devices for various useful purposes is

(a) light (b) mechanics (c) thermodynamics (d) electronics

(2) Who observed the deflection of cathode rays by both electric and magnetic fields?

(a) Newton (b) J.J Thomson (c) Plank (d) Charles

(3) Cathode rays contain negatively charged particles called:

(a) Neutrons (b) protons (c) electrons (d) positrons

(4) The process of emission of electrons from the hot metal surface is called;

(a) dynamic emission (b) electronic emission
(c) thermionic emission (d) static emission

(5) Metals contain large number of:

(a) free electrons (b) Free protons (c) free neutrons (d) bound electrons

(6) For thermionic emission typical values of voltage and current used are:

(a) 3v, 0.4A (b) 6V, 0.3A (c) 5V, 0.3A (d) 6V, 0.1A

(7) Electron gun is used to investigate the properties of;

(a) electron beam (b) nucleus (c) neutron (d) proton

(8) The degree of deflection of electrons from their original direction is proportional to;

(a) the speed of electrons (b) the strength of the electric field applied
(c) the amount of current (d) the potential difference

(9) A component of cathode-ray oscilloscope (C.R.O) is;

(a) the electron gun (b) the deflecting plates
(c) a fluorescent screen (d) all of given

(10) Electron gun has an electrode for controlling the flow of electron in the beam;

(a) grid C (b) grid A (c) grid B (d) grid G

(11) The screen of a cathode-ray tube consists of a thin layer of;

(a) aluminium (b) potassium (c) phosphor (d) sulphur

(12) Cathode-ray oscilloscope (C.R.O) is used in many field of science for;

(a) displaying waveforms (b) measuring voltages
(c) range-finding (d) all given are true

(13) To find the depth of sea-beds, C.R.O is used as:

(a) echo-sounding (b) displaying waveforms
(c) measuring voltage (d) range finding

16.4 Analogue and Digital Electronics
16.5 Basic Operations of Electronic-Logic Gates

(14) Analogue quantities are;

(a) whose values vary continuously (b) whose values remain cosntatn
(c) e.g. temperature of air (d) all of given are true

(15) Time , pressure, distance are all:

(a) analogue quantities (b) variable quantiites
(c) nominal quantities (d) digital quantities

(16) **Which is an analogue circuit which amplifies the singals without chaninging its shape to such an extent that it can operatre a loudspeaker?**
(a) Galvanometer (b) Manometer (c) amplifier (d) Optical fiber

(17) **The quantities whose value vary in non –continuous manner are called;**
(a) analogue quantities (b) digital quantities
(c) statistic quantities (d) continuous quantiies

(18) **Those quantities whose value vary continuously or remain constant:**
(a) Analogue (b) Digital (c) Hybrid (d) All of them

(19) **Which of the following is an analogue device?**
(a) Electric fan (b) Electric iron (c) Radio receiver (d) All of them

(20) **Electronics which provides the data in the form of maximum and minimum voltage signals:**
(a) Analogue (b) Digital (c) Hybrid (d) All of them

(21) **Which of the following are digital devices?**
(a) Computer (b) Mobile phone (c) Digital camera (d) All of them

(22) **Circuits which convert the digital signal into analogue signals:**
(a) ADC (b) DAC (c) CAD (d) None of them

(23) **Circuits which convert the analogue signal into digital signal:**
(a) ADC (b) DAC (c) CAD (d) None of them

(24) **Digital electronics uses two digits.**
(a) 0,2 (b) 0,3 (c) 0,1 (d) 0,4

(25) **A switch has only possible states.**
(a) Two (b) Three (c) Four (d) Five

(26) **The states of binary variables are usually represented by the digits;**
(a) 1,2 (b) 0,2 (c) 0,3 (d) 0,1

(27) **George Boolean invented a special algebra known as algebra of logics or _____.**
(a) Boolean algebra (b) Geometry (c) Ratios (d) Trigonometry

(28) **Boolean algebra operates with two logic states represented by two distinct voltage level.**
(a) 0,2 (b) 0,3 (c) 1,0 (d) 1,1

(29) **The number of operations of Boolean algebra are:**
(a) 1 (b) 2 (c) 3 (d) 4

(30) **In Boolean Algebra zero represents:**
(a) Zero potential (b) Ground potential (c) Low potential (d) Both a & b

(31) **In Boolean Algebra 1 represents:**
(a) 5V (b) 1V (c) Both a & b (d) None of above

16.6 AND Operation
16.7 OR Operation

(32) **The logical operation, whose output will only be one if its all inputs are 1:**
(a) AND (b) OR (c) NOT (d) All of above

(33) **The logical operation, whose output will only be zero if its all inputs are zero:**
(a) AND (b) OR (c) NOT (d) All of above

(34) **AND operation is just like --------- combinations of resistors:**
(a) Series (b) Parallel (c) Both (d) None of above

(35) **AND operations is represented by:**
(a) Dot (•) (b) Multiplication sign (c) Any sign (d) Both a & b

(36) **OR operation is just like --------- combinations of resistors:**
(a) Serial (b) Parallel (c) Both (d) None of above

(37) **OR operations is represented by:**
(a) Dot (•) (b) Multiplication sign (c) '+' sign (d) Both a & b

(38) **The various operations of Boolean variables are also called:**
(a) Boolean constants (b) Algebraic operations (c) Logic operations (d) Both b & c

(39) **The circuit which implements the AND operation is called:**
(a) AND gate (b) AND circuit (c) OR gate (d) Both a & b

(40) **The circuit which implements the OR operation is called:**
(a) AND gate (b) OR circuit (c) OR gate (d) Both b & c

(41) **The word "truth" that is used in Boolean algebra is borrowed from:**
(a) Mathematics (b) Italian (c) Geometry (d) Subject of Logic

(42) **If switches S_1 and S_2 both are open the lamp is:**
(a) ON **(b)** OFF
(c) sometime ON and sometime OFF **(d)** Neither ON nor OFF

(43) **In case of OR operation the lamp is Off when:**
(a) S_1 and S_2 are open **(b)** S_1 is open and S_2 is closed
(c) S_1 is closed and S_2 is open **(d)** S_1 and S_2 are closed

(44) **OR operation is represented by the symbol of (+) and Boolean expression for OR is:**
(a) $x = A + B$ **(b)** $x = A - B$ **(c)** $x + A = A$ **(d)** $X = \overline{A+B}$

16.8 NOT Operation
16.9 NAND Gate

(45) **NOT operation is represented by:**
(a) line (b) bar over the symbol
(c) both A & B (d) (.) dot

(46) **Value of a Boolean variable 1 after NOT operation is;**
(a) 0 (b) +1 (c) -1 (d) -2

(47) **After NOT operation the value of Boolean variable 0 is;**
(a) 0 (b) +1 (c) -1 (d) 1

(48) **NOT gate is also called;**
(a) converter (b) inverter (c) adder (d) substractor

(49) **NAND operation is simply an AND operation followed by a;**
(a) NOR operation (b) OR operation (c) NOT operation (d) AND operation

(50) **NOT operation is also known as:**
(a) Gate (b) Inverter (c) Converse (d) All of above

(51) **Number of input(s) of NOT operation are:**
(a) 1 (b) 2 (c) 3 (d) 4

(52) **The circuit which is used to implement NOT operation:**
(a) AND gate (b) NOT gate (c) OR gate (d) Both a & b

(53) **NAND gate is the combination of:**
(a) AND & OR (b) AND & NOT (c) NOT & OR (d) None of them

(54) **A and B are two inputs of NAND gate. Its output would be zero when**
(a) A=0, B=0 (b) A=1, B=0 (c) A=0, B=1 (d) A=1, B=1

(55) **NOR gate is the combination of:**
(a) AND & OR (b) AND & NOT (c) NOT & OR (d) None of them

(56) **A and B are the two input of NOR gate. Its output would be 1 when:**
(a) A=0, B=0 (b) A=1, B=0 (c) A=0, B=1 (d) A=1, B=1

(57) **The output of the NAND is written as;**
(a) $x = A + B$ (b) $X = A - B$ (c) $x = A.B$ (d) $X = \overline{A.B}$

16.10 NOR Gate
16.11 Uses Of Logic Gates

(58) **The NOR operation is simply an OR operation followed by a;**
(a) NOT operation (b) AND operation (c) NAND operation (d) OR operation

(59) **The Boolean expression for NOR operation is;**
(a) $X = \overline{A+B}$ (b) $X = A - B$ (c) $X = A + B$ (d) $X = \overline{A.B}$

(60) **To make burglar alarm, we use:**
(a) NAND gate (b) OR gate (c) NOT gate (d) NOR gate

ANSWER KEY

Q.	Ans	Q.	Ans	Q.	Ans	Q.	Ans	Q.	Ans	Q.	Ans
1	d	11	c	21	d	31	a	41	d	51	a
2	b	12	d	22	b	32	a	42	a	52	b
3	c	13	a	23	a	33	b	43	a	53	b
4	c	14	d	24	c	34	a	44	a	54	d
5	a	15	a	25	a	35	a	45	b	55	c
6	b	16	c	26	d	36	b	46	a	56	a
7	a	17	b	27	a	37	c	47	d	57	d
8	b	18	a	28	c	38	c	48	b	58	a
9	d	19	d	29	c	39	a	49	c	59	a
10	d	20	b	30	d	40	c	50	b	60	a