**SESSION SEPTEMBER 2022**

**PROGRAM BCA**

**SEMESTER II**

**COURSE CODE &amp; NAME DCA1205, Digital Logic**

**SET-I**

**1.  Define a number system. Explain how to convert binary numbers to decimal numbers with example.**

**Answer:**

A number is a mathematical value used for counting and measuring objects, and for performing arithmetic calculations. Numbers have various categories like natural numbers, whole numbers, rational and irrational numbers, and so on. Similarly, there are various types of number systems that have different properties, like the binary number system, the octal number system, the decimal number system, and the hexadecimal number system.

A number system is defined as the representation of numbers by using digits or other symbols in a consistent manner. The Its Half solved only

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**2.  Explain various logic gates in detail.**

**Ans:** A logic gate is an electronic circuit which has one or more inputs but only one output. Logic gate produces logical operation on binary numbers.

Now let us study basic logic gates. OR gate: OR gate has two or more inputs and only one output. The operation of this gate is such that it produces a high output (i.e. logic 1) when one or more of inputs are high and it

**3.  Define K-map. Simplify f (a, b, c, d) =∑m(0, 2, 4, 6, 7, 8, 9, 11, 12, 14). 2+8 10**

**Ans:** A Karnaugh map (K-map) is a pictorial method used to minimize [Boolean](https://whatis.techtarget.com/definition/Boolean) expressions without having to use Boolean algebra theorems and equation manipulations. A K-map can be thought of as a special version of a [truth table](https://whatis.techtarget.com/definition/truth-table) .

Using a K-map,

**SET-II**

**4.  Define Sequential Circuits. Brief the working of RS flip flop.**

**Ans:** Sequential circuits are those whose outputs depend not only on the present value of its inputs but also on past history of its inputs. There are two types of memory elements which are used in sequential circuits, they are latch and flip flop. Flip flop is a device which changes its state at the positive edge or negative edge (also known as leading edge and trailing edge) of the clock signal. Asynchronous latch is a device which changes its state whenever there is a change in the

**5. Describe the Digital counter. Explain in detail about Ring Counter.**

**Ans:** A Digital Counter is obtained by arranging the [flip-flops](https://www.watelectronics.com/flip-flops/). These are the applications of flip-flops. Other than counting, these are used for measuring the frequency as well as time. These are used to increase the addresses in memory. The operation of these devices depends on the single clock applied.  These

**6. Explain the working principle of Traffic Signal Systems.**

**Ans:** Traffic Signal Systems This is an automatic traffic light controller and can be implemented by programming any gate array based logic (GAL) device such as FPGA. The important features of this design are as follows.

1. The density of traffi