

**Paper Code: BCA - 106**  
**Paper: Digital electronics**  
**Paper Id 20106**  
**Pre-requisite :**

<b>L</b>	<b>T/P</b>	<b>C</b>
<b>3</b>	<b>1</b>	<b>4</b>

- Physics

**Aim**

- To understand various digital systems and their applications.

**Objectives**

- To learn about the design principles of different digital electronic circuits
- To study the applications of above circuits

<b>INSTRUCTIONS TO PAPER SETTERS:</b>	<b>MAXIMUM MARKS: 75</b>
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.	

**UNIT-I**

**Logic gates** NOT , AND, OR, Universal gates- NAND , NOR. EX-OR and EX-NOR gates.

**Diode and Transistor as a switch**

**Logic Families**-RTL,DTL,TTL,ECL,CMOS – **(Main features only - without details of circuit connections and working)**. Definition of- current and voltage parameters, noise margin, Fan-in, Fan-out

**Boolean Algebra**

Basics Laws of Boolean Algebra, Logic Gates, Simplifications of Boolean equations using K-maps.[T1,T2,T3] **[No. of Hrs: 11]**

**UNIT-II**

Review of various number systems (Binary, Octal, Hexadecimal), Definition of BCD , Gray codes and Excess – 3 codes and their application **(without design of code convertors)**

**Parity generation and Checking.**

**Arithmetic Circuits**

Adder, Subtractor, Parallel binary adder/Subtractor, binary multiplier and divider.

**Combinational Circuits**

Multiplexers, De-Multiplexers, decoders, encoders,.[T1,T2,R3] **[No. of Hrs: 11]**

**UNIT-III**

**Flip-flops**

S-R, D, J-K, T, Clocked Flip-flop, Race around condition, Master slave Flip-Flop, Realisation of one flip-flop using other flip-flop.

**Shift Registers**

Serial-in-serial-out, serial-in-parallel-out, parallel-in-serial-out and parallel-in-parallel-out, Bi-directional shift register. [T1,T2,R3] **[No. of Hrs: 11]**

**UNIT-IV**

**Counters**

Ripple counter, Synchronous Counter, Modulo Counters, Ring Counter, Twisted Ring

Note : A Minimum of 40 Lectures is mandatory for each course.

Syllabus of Bachelor of Computer Applications (BCA), approved by BCA Coordination Committee on 26<sup>th</sup> July 2011 & Sub-Committee Academic Council held 28<sup>th</sup> July 2011. W.e.f. academic session 2011-12

Counter.

Memory Devices - RAM, ROM, PAL & PLA [T1,T2,T3,R3]

[No. of Hrs: 11]

**TEXT BOOKS**

[T1]. Moris Mano, “Digital Logic and Computer Design”, PHI Publications, 2002.

[T2]. Raj Kamal, “Digital Systems “ , Principles and Design, Pearson ,2011.

[T3]. R. P. Jain, “Modern Digital Electronics”, TMH, 3rd Edition, 2003.

**REFERENCES:**

[R1]. R.L.Tokheim, “Digital Electronics, Principles and Applications”, Tata McGraw Hill, 1999.

[R2]. W.Gothman, “Digital electronics”, PHI.

[R3]. S. Salivahanan & S. Arivvyhgan. “Digital circuits and design”, Vikas Publication, 2001.

[R4]. Malvino Leach, "Digital Principles and Application", TMH, 1999.

Note : A Minimum of 40 Lectures is mandatory for each course.

Syllabus of Bachelor of Computer Applications (BCA), approved by BCA Coordination Committee on 26<sup>th</sup> July 2011 & Sub-Committee Academic Council held 28<sup>th</sup> July 2011. W.e.f. academic session 2011-12