

Roll No.

91531

**B. Sc. 2nd Semester Physics (Hons.)
(New Scheme) Examination – May, 2016**

**LINEAR & DIGITAL INTEGRATED CIRCUITS &
INSTRUMENTATION-II**

Paper : Phy-206

Time : Three Hours] [Maximum Marks : 40

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt five questions in all, selecting at least two questions from each Unit.

UNIT - I

1. (a) Explain the working of a JK flip-flop. How it can be converted into RS flip-flop? 6
(b) What will be the outputs of the RS flip-flop if the following pulse trains (i) 101011 (ii) 111110 are applied to R and S respectively. 2
2. What is Race-Round condition in flip-flops ? Explain the working of Master-Slave JK flip-flop with block diagram. 8

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3. What is a shift register ? Write the various types of it ? Explain parallel in, parallel out mode with block and logic diagrams. 8
4. Draw the block diagram for an A/D converter using a counter. Explain the operation of this system. 8

UNIT – II

5. (a) Explain how IC555 timer can be used as a frequency divider ? 5
- (b) A 555 timer is used as an astable multi vibrator to produce pulses of 10 kHz. If R_A and R_B are equal and the capacitance used is $0.1 \mu\text{F}$, what resistance is required ? 3
6. Explain the working of an inductor filter in a full wave rectifier with resistive load. Derive the expression for ripple factor. 8
7. Draw the block diagram of a CRO. Describe how it can be used to measure the frequency. 8
8. Derive an expression for vertical deflection of an electron beam in a CRT and hence define deflection sensitivity. 8