

Roll No.

21276

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**B. Sc. (Physics) (Hons.) 2nd Semester
Examination – May, 2019**

**LINEAR AND DIGITAL INTEGRATED CIRCUITS &
INSTRUMENTS-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 : A student has to attempt *five* questions in all, selecting at least *two* questions from each Unit.

UNIT – I

1. Answer the following questions briefly : 2 × 4 = 8

- (a) Explain the race-around condition in flip-flops.
- (b) Define the term accuracy and resolution for analog to digital convertor.

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- (c) Explain serial-in-parallel-out(SIPO) shift register.
- (d) What are sequential circuits ? Explain with suitable examples ?

2. (a) Explain the working of master-slave JK flip-flop with suitable diagrams. 5

(b) Derive characteristic equations of SR & JK flip-flop. 3

3. (a) Compare synchronous and asynchronous counters. 3

(b) Design a MOD 6 synchronous counter. 5

4. A weighted resistor D/A convertor has $n = 8$ bit, the reference voltage $V_R = 10$ V, the resistance $R = 12$ K Ω (Kilo ohm) and feedback resistance of the op-amp $R_F = 6$ K Ω . Calculate : 8

- (a) The output voltage V_o corresponding to LSB.
- (b) The output voltage V_o corresponding to MSB.
- (c) Maximum value output voltage V_o .

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- (d) Nominal full scale output voltage V_o .
- (e) Resolution.
- (f) The output voltage V_o corresponding to binary input 10101100.

UNIT – II

- 5. Explain in detail the working of full wave bridge rectifier with suitable waveform diagrams. Also derive the expression for its ripple factor.
- 6. What are filters ? Explain the working of L & C filter in detail.
- 7. (a) Draw and explain the block diagram of CRO. Explain how frequency is measured using CRO ?
(b) Explain the working of time base generator with suitable diagrams.
- 8. (a) Draw the pin diagram and explain the function of various pins of IC 555 timer.
(b) Explain the working of IC 555 timer as a multivibrator.