III B.Tech I Semester Supplementary Examinations, October/November - 2019
PULSE AND DIGITAL CIRCUITS
(Common to Electronics and Communication Engineering, Electronics and
Instrumentation Engineering)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**

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PART –A   (22 Marks)

1 a) Define Linear Wave Shaping.   [4M]
   b) Justify that a clamping circuit is a dc inserter.   [3M]
   c) Define rise time and transition time of a diode.   [4M]
   d) What is hysteresis? how it can be eliminated in a Schmitt trigger?   [3M]
   e) What are the general features of a time base signal?   [4M]
   f) Name some negative resistance devices used as relaxation Oscillator.   [4M]

PART –B   (48 Marks)

2 a) Explain the operation of attenuators.   [5M]
   b) A symmetrical square wave of peak to peak amplitude V and frequency f is applied   [8M]
       to a high pass RC circuit. Find the percentage tilt.
   c) What is Ringing circuit?   [3M]

3 a) Explain transfer characteristics of the emitter coupled clipper.   [4M]
   b) Draw the basic circuit diagram of positive peak clamper circuit and explain its   [8M]
       operation.
   c) What do you mean by compensation? Explain in detail.   [4M]

4 a) What are the saturation parameters of transistor and explain their variation with   [8M]
       respect to temperature.
   b) Derive expressions for rise time and fall time in terms of the transistor parameters   [8M]
       and operating currents.

5 a) Explain the principle of operation of Monostable multivibrators.   [8M]
   b) Design a collector coupled Mono-stable for the following specifications: I_{CBO} and   [8M]
       voltage drops across saturated transistors are negligible. For the transistors
       $h_{FE (min)}$=20, and the base-emitter cutoff voltage for the normally OFF transistor is
       –1 V. The base drive to the transistor in saturation is 50% in excess of minimum
       required. Collector supply voltage is 6V and collector current=2 mA the delay time
       is 3000 µsec. Choose R_1=R_2. Find R_C, R, R_1, C and V_{BB}.

6 a) Define and derive the terms slope error, displacement error and transmission error.   [8M]
   b) Explain the working of a Miller sweep circuit and derive expression for the slope   [8M]
       sweep error.

7 a) With a neat circuit, explain a method of compensation used to improve the linearity   [8M]
       of a bootstrap time base circuit.
   b) Explain the principle of "synchronization" and synchronization with frequency   [8M]
       division.

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