

Code: EC4T2, EM4T1, EE4T6

**II B.Tech - II Semester – Regular Examinations - JUNE 2014**

**PULSE AND DIGITAL CIRCUITS**

**(Common for ECE, ECM, EEE)**

Duration: 3 hours

Marks: 5×14=70

Answer any FIVE questions. All questions carry equal marks

1. a) Prove that how a low pass RC circuit behaves like a differentiator circuit. Explain with necessary assumptions. 7 M
- b) A symmetrical square wave having the following properties is applied to a RC high pass circuit with  $R=1\text{ K}\Omega$ ,  $C=1\mu\text{F}$ . Explain the behavior of the RC high pass circuit for triangular wave input with neat sketches:  
Peak to peak amplitude  $\pm 5\text{ V}$ , frequency of the signal is 1KHz. 7 M
2. a) Explain the operation of a parallel clipper (consider the circuit without any external battery) with a neat sketches. 7 M
- b) Explain the operation of a negative clamper circuit (consider the circuit without any external battery) with a neat sketches. 7 M
3. a) Explain the operation of a Schmitt trigger circuit with a neat sketches. 7 M
- b) Explain the operation of a fixed bias transistor binary with neat sketches. 7 M

4. a) Explain the operation of a emitter-coupled mono stable multi vibrator with neat sketches. 7 M
- b) Design a collector-coupled mono stable multi vibrator using an n-p-n Silicon transistor with  $h_{FE(min)} = 40$ ,  $V_{BE (cut off)} \approx 0 V$  and  $I_{B(sat)} = 1.5I_{B(min)}$ .  
 Given that:  $V_{CC} = 10 V$ ,  $I_{C(sat)} = 5 mA$ ,  $R_{C1} = R_{C2} = R_C$ ,  $V_{CE(sat)} = 0.2 V$  and  $V_{BE(sat)} = 0.7 V$ . If the pulse width required is 1 ms, calculate the value of C. 7 M
- 5) Explain the transistor current time base generator in detail with neat sketches. 14 M
6. a) Explain in detail about synchronization in sweep circuits. 7 M
- b) Explain sine wave synchronization with a sweep circuit. 7 M
7. a) Explain how a pedestal in logic gates can be reduced? 7 M
- b) Explain the operation of uni-directional logic for multi input gates with neat sketches. 7 M
8. a) Explain how a transistor can work as a switch with neat diagrams 7 M
- b) Determine base and collector resistors for the transistor inverter if  $I_{csat}=20 mA$ ,  $h_{FE}=150$ ,  $V_{cc}=10 V$ . 7 M