Total number of printed pages – 4   B. Tech

CPEN 5305 / CPEC 5306

Sixth Semester Examination – 2008

ADVANCED ELECTRONICS CIRCUITS

Full Marks – 70

Time : 3 Hours

Answer Question No. **1** which is compulsory
and any **five** from the rest.

The figures in the right-hand margin
indicate marks.

1. Answer the following questions :   2×10

    (a) What are the two requirements for
         oscillation ?

    (b) What are Pass band and Stop bands for
         a filter ?

    (c) Define Notch-out frequency.

    (d) Give any two applications of Astable
         Multivibrator.

P.T.O.

(e) Draw the output waveform for Collector-coupled monostable multi.

(f) Define Transition time of commutating capacitors.

(g) Define Transient response and Steady state response.

(h) Draw the Characteristic waveform of UJT.

(i) Define sweep-speed error. Give an expression.

(j) Name any four methods for generating a time-base waveform.

2. (a) Explain Voltage controlled oscillator with a neat sketch of circuit and output waveforms.   5

(b) For a typical connection diagram of VCO with parameters :   5

$+V=12V$, $R2=1.5$ Kohm, $R1 = R3 =10$ Kohm and $c1= 0.001$ microF

  (i) Determine the nominal frequency of the output waveforms.

  (ii) Compute the modulation in the output frequencies if Vc is varied between 9.5 V and 11.5 V.

3. (a) Draw frequency response curves for high-pass filter and derive expression for cut-off frequency.   5

(b) Design a high-pass filter at a cut-off frequency of 1 KHz with a pass band gain of 2.   5

4. (a) Explain with a neat sketch the operating principle of Schmitt Trigger circuit.   5

(b) Explain in detail any two applications of Schmitt Trigger circuit with necessary circuit diagrams and waveforms if necessary.   5

5. (a) Explain with a neat sketch the operation principle of Emitter-coupled monostable multi with waveforms.   5

(b) For a emitter-coupled monostable multi circuit with parameters :

$Vcc = 18V$, $R_{C1} = 6K$, $R_{C2} = 5K$, $Re = 4K$, $R =100K$. Calculate the voltage levels at $t = 0+$ only. Assume germanium transistors $h_{FE}=50$ and $r_{bb}=200$ ohm.   5

6. Explain in detail with circuit diagrams and equations the Shunt compensation of a transistor stage in a cascade with identical poles.

10

7. (a) Explain Principle and characteristics of Tunnel diode with neat sketch. 6

   (b) Explain in detail with a neat sketch the Astable circuit using Tunnel diode. 4

8. (a) Explain the IC555 Timer Monostable operation with waveforms. Provide a neat sketch for this. 7

   (b) In a IC555 monostable operation, $R_A = 10$ Kohm, the ouput pulse width $t_p = 10$ ms. Determine the Value of C. 3