Registration No. :

Total number of printed pages – 2

B. Tech

CPEC 5306 (New)

Sixth Semester (Back) Examination – 2013
ADVANCED ELECTRONICS CIRCUITS
BRANCH : EC,ETC,ICE
QUESTION CODE : B329
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) How quality factors (Q) effect the performance of band pass filter ?

   (b) What is the cut off frequency of an op-amp if the unity-gain bandwidth is 1 MHz and the open-loop voltage gain is 105 ?

   (c) What is a commutating capacitor ? What is its function in multivibrator circuits ?

   (d) What are major disadvantages of an active filter when OPAMP in filters is used in inverting mode ?

   (e) What is a voltage controlled oscillator (VCO) ? Write the transfer function of a VCO.

   (f) Define sweep speed error. Give an expression.

   (g) What is capture and lock range of a phase locked loop (PLL) ?

   (h) Differentiate between symmetrical and Un-symmetrical triggering.

   (i) Draw the characteristic waveform of UJT.

   (j) Write the transfer function of a 2nd order low pass filter. What is the magnitude of roll off rate (ROR) for this filter ?

2. (a) What is a phase detector ? Explain the principle operation of a phase detector. 5

   (b) Explain the principle of a phase locked loop (PLL) and then find the transfer function of a 2nd order PLL. 5

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3. (a) What is a time base voltage ? With a neat diagram, explain the principle of a transistor current time base generator ? 5

(b) Explain the principle, operation and characteristics of a tunnel diode. How it can be used as negative resistance switching circuits ? 5

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

(b) Design low pass filter at a cut-off frequency of 10 KHz with a pass band gain of 4. 5

5. (a) What is all pass filters ? What is its importance ? Draw an active all pass filter circuit and find its phase and magnitude. 5

(b) For the all-pass filter, determine the phase shift between the input and output at f = 2 KHz. To obtain a positive phase shift, What modifications are necessary in the circuit ? 5

6. (a) What is a comparator circuit ? What are the characteristics of a comparator ? Explain how OPAMP can be used as a voltage comparator. 5

(b) What are the conditions for self sustained oscillation in an oscillator circuits ? With a neat diagram, explain wein-bridge oscillator. 5

7. (a) What is a Schmitt trigger circuits ? Discuss various applications of Schmitt trigger circuits. 5

(b) What do you mean by triggering of multivibrators ? What are the various methods to trigger the bistable multivibrators ? 5

8. Write short Notes on any two of the following : 5×2

(a) Voltage controlled oscillator (VCO)

(b) UJT

(c) IC 555 as mono stable multivibrator

(d) Notch filter.